

Stress in emergency telephone number operators during the COVID-19 pandemic: the role of self-efficacy and Big Five personality traits

BACKGROUND

Emergency telephone number operators experience many challenges in their work during the COVID-19 pandemic. Their personality traits and self-efficacy may act as important factors in their level of perceived stress. The aim of this study was to determine the relationship between Big Five personality traits, self-efficacy and perceived stress among emergency telephone number operators during the COVID-19 pandemic.

PARTICIPANTS AND PROCEDURE

One hundred emergency telephone number operators participated in the study. The Perceived Stress Scale (PSS-10), Ten Item Personality Inventory (TIPI) and Generalized Self Efficacy Scale (GSES) were used.

RESULTS

Emergency telephone number operators experienced a moderate level of perceived stress. The level of perceived stress was associated with all Big Five personality traits and self-efficacy. Stepwise regression showed that self-

efficacy and emotional stability were significant predictors of perceived stress in a tested sample of emergency telephone number operators. Self-efficacy acted as a mediator between the 4 Big Five personality traits (except extraversion) and perceived stress.

CONCLUSIONS

Self-efficacy can be a very important resource during the struggle of emergency telephone number operators with the successive waves of the COVID-19 pandemic. Operators with a high level of this resource can more effectively cope with the changes and perceive stress as lower. Individuals' personality traits may affect the level of self-efficacy that determines how stress is perceived. It is important to strengthen the self-efficacy of those involved in the fight against the COVID-19 pandemic.

KEY WORDS

stress; Big Five; self-efficacy; COVID-19; emergency telephone number operators

ORGANIZATION – 1: Department of Health Psychology and Quality of Life, Institute of Psychology, Opole University, Opole, Poland · 2: Emergency Notification Center, Opole, Poland

AUTHORS' CONTRIBUTIONS – A: Study design · B: Data collection · C: Statistical analysis · D: Data interpretation · E: Manuscript preparation · F: Literature search · G: Funds collection

CORRESPONDING AUTHOR – Rafał Gerymski, Department of Health Psychology and Quality of Life, Institute of Psychology, Opole University, 1 Staszica Square, 45-052 Opole, Poland, e-mail: rafal.gerymski@uni.opole.pl

TO CITE THIS ARTICLE – Dymecka, J., Tarczyński, R., & Gerymski, R. (2023). Stress in emergency telephone number operators during the COVID-19 pandemic: the role of self-efficacy and Big Five personality traits. *Health Psychology Report*, 11(2), 145–155. <https://doi.org/10.5114/hpr.2022.115820>

RECEIVED 10.02.2022 · REVIEWED 08.04.2022 · ACCEPTED 11.04.2022 · ONLINE PUBLICATION 31.05.2022

BACKGROUND

For over two years, the entire world has been struggling with one of the greatest threats to public health in the twenty-first century. This threat was caused by the SARS-CoV-2 coronavirus pandemic, which causes the COVID-19 disease. According to the World Health Organization (WHO, 2022), almost 325 million people in the world have been infected and more than 5.5 million have died. The first case of COVID-19 in Poland was recorded on March 4, 2020, and by January 26, 2022, almost 5 million people had been infected and more than 104,000 had died.

The outbreak of contagious disease causes severe stress in society, with health care workers being one of the most affected groups. During the COVID-19 pandemic, healthcare professionals work longer hours, are more tired and experience a lot of negative emotions (Dymecka et al., 2021f). So far, many studies have been carried out on mental functioning during a pandemic and coping with stress in various medical professions: doctors, nurses, and midwives. However, it is difficult to find research on emergency telephone number operators working in emergency notification centres. It should also be noted that even before the pandemic, these operators were working in a very stressful environment, sometimes deciding about human life or health, which might have an impact on their physical and mental condition (Sikora-Wojtarcowicz & Nienartowicz, 2015).

The Emergency Notification System (ENS) is a unified system that handles emergency notifications to 112, 997, 998 and 999 – Polish emergency numbers – enabling the transmission of an emergency report to engage the appropriate emergency services. The tasks of the ENS include: (1) the acceptance/selection of the reports about a sudden threat to life, health, environment and property, (2) deployment of forces and resources of rescue services and cooperating entities, (3) supporting the person managing the rescue operation, (4) analysing the possibilities of hospital emergency departments and other units of hospitals. Emergency operators answer the calls, then conduct the conversation to obtain the relevant information and forward the report to the emergency services (Walek, 2016).

During the COVID-19 pandemic, many countries' emergency systems have been under heavy strain. Some countries have even implemented special rules for emergency numbers during the pandemic (Caviglia et al., 2020). According to the data of the Polish government, the coronavirus pandemic caused a significant increase in calls to the emergency number 112 (Mnich, 2020). It was associated with an increase in morbidity, the need for urgent intervention and saving the infected people, but also the isolation made more people call the emergency number because they needed psychological help. It is not surprising then

that the emergency number operators may feel significant stress during the COVID-19 pandemic. It is related to both the performance of professional duties, the need to deploy rescue teams in a situation of a significant burden on health care, or communication with infected people staying in isolation or quarantine, who also feel severe stress and negative emotions. In addition, the emergency number operators during a pandemic are exposed to stress similar to the rest of society, related to the fear of being infected, infection or death of a loved one or being in quarantine (Dymecka, 2021).

Feeling stressed during a pandemic may be related to both the professional duties and personality factors. The five-factor model of personality, known as the Big Five, is one of the most popular theories among personality researchers around the world. Individuals may be characterized by relatively enduring patterns of thoughts, feelings, and actions. The five-factor model describes the dimensions: neuroticism, extraversion, openness to experience, agreeableness and conscientiousness (McCrae & Costa, 2005, 2008). Personality variables have a long history of affecting stress. Studies have shown a relationship between personality traits and the probability of experiencing stressful situations (Bolger & Zuckerman, 1995) and that mostly neuroticism makes the situation perceived as stressful (Guthert et al., 1999). Neuroticism, extraversion, and conscientiousness have been shown to be associated with experiencing stress and coping (Vollrath & Torgersen, 2000). Studies conducted during the COVID-19 pandemic have shown that neuroticism was associated with experiencing health anxiety and stress (Lee et al., 2020). Agreeableness and extraversion have also been shown to play a role in predicting COVID-19-related psychological distress. During isolation, these two personality traits may be associated with seeking support, networking, and a sense of community (Nikčević et al., 2021). The Big Five personality traits were associated with difficulties in work and social adjustment during the pandemic. Neuroticism was associated with worse adaptation, and agreeableness was a protective factor (Nikčević & Spada, 2020). Based on the above studies, it can be assumed that neuroticism will be one of the most important personality traits related to the severity of perceived stress.

Self-efficacy (SE) is another variable acting as a personal resource, regulating human functioning. It is related to faith in oneself, in one's own abilities and in the effectiveness of one's behaviour towards a specific task (Bandura, 2007). Bandura (1977, 1982) considers self-efficacy to be a determinant of what activities people will undertake, how much effort they will put into them, and how long they will be able to continue the task after stressful situations arise. The level of SE can influence whether an individual will make an effort to cope with a specific situation. Self-

Joanna Dymecka,
Robert Tarczyński,
Rafał Gerymski

efficacy is the belief that a person is able to cope with an activity or task even in new, unpredictable, difficult and stressful conditions (Luszczynska et al., 2005; Pervin & John, 2001). In the context of stressful situations such as a pandemic, research has shown that self-efficacy has a significant impact on behaviour and well-being. During the previous SARS epidemic, it was shown that nurses with lower levels of SE had a higher tendency to experience fear (Ho et al., 2005). Much research has been conducted on the role of self-efficacy during the COVID-19 pandemic showing that SE was a significant factor associated with perceived stress. It was shown that self-efficacy was related to the level of perceived stress in nurses (Shahrour & Dardas, 2020). Research also indicates that self-efficacy plays an important role in managing anxiety related to COVID-19 (Bidzan et al., 2020). Among nurses working in intensive care units, it was also shown that self-efficacy was associated with a lower perception of stress (Peñacoba et al., 2021). Moreover, many studies conducted among many groups experiencing difficult situations have shown that self-efficacy can act as a mediator between experiencing difficult situations and feeling stress. Self-efficacy has been shown to mediate between resource loss and perceived stress in people experiencing natural disasters (Benight et al., 1999). It was also a mediator between experiencing difficult situations and depression (Maciejewski et al., 2000), as well as between acute stress response and long-term distress following natural disasters (Benight & Harper, 2002). In addition, self-efficacy partially mediated the relationship between Big Five personality traits and depressive symptoms among Chinese unemployed individuals (Wang et al., 2014). Polish studies have shown that SE acted as a mediator between meaning in life and subjective well-being in cardiac patients, as well as affect and psychological well-being in spouses of cancer patients (Krok & Gerymski, 2019, 2021).

Due to the finding of the importance of self-efficacy in the perception of stress in health care workers during the COVID-19 pandemic, the aim of the current study was to determine the relationship between Big Five personality traits, self-efficacy and perceived stress among emergency number operators. It was assumed that the variables particularly important for perceiving stress would be neuroticism and self-efficacy and that self-efficacy would play the role of a mediator between Big Five personality traits and perceived stress.

PARTICIPANTS AND PROCEDURE

PARTICIPANTS

The present study was carried out using the paper-pencil method. It was conducted by one of the co-

authors (2nd co-author; R. T.), who is both a psychologist and emergency telephone number operator. One hundred emergency number operators participated in this study – 69 women and 31 men. The age of the respondents ranged from 22 to 66 ($M = 34.57$, $SD = 8.58$). The work experience of the emergency number operators ranged from half of a year to 10 years ($M = 4.70$, $SD = 2.51$). The vast majority of the respondents were people with higher education (83.00%); a small percentage of respondents had completed secondary (9.00%) or post-secondary (8.00%) education. The survey was conducted between December 2020 and March 2021 in three Polish cities: Opole, Radom and Szczecin. All respondents who consented to take part in the study were informed of its anonymity and purely scientific purpose. The levels of other sociodemographic variables were not measured.

MEASURES

Perceived Stress Scale. The level of perceived stress was tested using the Perceived Stress Scale (PSS-10) by Cohen et al. (1983), in the Polish adaptation of Juczyński and Ogińska-Bulik (2009). The scale is used to assess the stress experienced during the last month, without indicating its specific sources. The scale consists of 10 statements that can be responded to on a 5-point scale ranging from *never* to *very often*. In the current study, the scale obtained satisfactory psychometric parameters (Cronbach's $\alpha = .85$).

Ten Item Personality Inventory. Personality traits were assessed using the Ten Item Personality Inventory (TIPI) by Gosling et al. (2003) in the Polish adaptation by Sorokowska et al. (2014). This tool measures five personality traits (each dimension consists of two questions). The following dimensions of personality are distinguished in the questionnaire: extraversion, agreeableness, conscientiousness, emotional stability and openness to experiences (Sorokowska et al., 2014). In the present study, all personality dimensions were characterized by reliability similar to the original version of the scale (Cronbach's α coefficient ranged from .53 to .85). It was decided to use TIPI due to the current epidemiological situation. While the present study was conducted during the COVID-19 pandemic, the emergency number operators were heavily burdened due to their work. Therefore, it was crucial to use a short screening questionnaire that would not burden the studied sample.

Generalized Self-Efficacy Scale. The Generalized Self-Efficacy Scale (GSES) developed by Schwarzer and Jerusalem (1995), adapted by Juczyński (2001), was used to determine the level of self-efficacy. The questionnaire consists of 10 items. The participants' task is to answer all questions on a four-point scale from 1 (*no*) to 4 (*yes*). Thanks to this tool, it is possible to establish the general level of self-efficacy: the

higher the score, the greater the level of self-efficacy. In the present study, the questionnaire's psychometric properties were satisfactory (Cronbach's $\alpha = .89$).

DATA ANALYSIS

The *t*-test was used to verify the significance of the differences between the studied groups. Pearson's *r* correlation and stepwise regression were used to estimate the relationships between selected variables. Bootstrapping mediation using the PROCESS 3.4 macro was performed with the declared number of 5000 samples (Hayes, 2017; Preacher & Hayes, 2008). Analyses were conducted using IBM SPSS 24. All statistical tests were two-tailed and the significance level was set to $\alpha = .05$.

RESULTS

GROUP HOMOGENEITY ANALYSIS

In the first step of the statistical analysis, it was verified whether the studied group of emergency telephone number operators was a homogeneous sample. Gender comparisons were made using the *t*-test for independent groups. The analysis showed statistically significant differences in levels of stress, self-efficacy and emotional stability. The analysis of the effect size measures showed that the indicated differences are moderate. On this basis, the test sample was treated as homogeneous in further analyses. For more detailed results, see Table 1.

RELATIONSHIPS BETWEEN STUDIED VARIABLES

Pearson's *r* correlation was used in order to verify the relationships between the studied variables. All

the studied relationships were statistically significant. Stress was negatively related to self-efficacy and personality traits. Self-efficacy was positively related to Big Five personality traits. Extraversion, agreeableness, conscientiousness, emotional stability and openness to experiences were also significantly and positively related to each other. The analysis showed that most of the tested relationships were moderate. For more detailed information, see Table 2.

In the next step, it was decided to verify which of the studied variables would be statistically significant predictors of stress in emergency telephone number operators. For that purpose, stepwise regression analysis was performed. Out of 6 tested predictors, only self-efficacy and emotional stability acted as significant predictors of stress and explained 60% of its variance. For more detailed information, see Table 3.

Lastly, bootstrapped mediation analysis using the PROCESS macro was performed in order to verify whether self-efficacy acted as a significant mediator between Big Five personality traits and stress in the emergency telephone number operators. Out of 5 tested models, 4 significant indirect effects were found. Self-efficacy was a significant mediator between agreeableness, conscientiousness, emotional stability and openness to experiences. Self-efficacy did not act as a significant mediator between extraversion and stress. For more detailed information, see Table 4.

DISCUSSION

The aim of the study was to determine the level of stress in emergency telephone number operators during the COVID-19 pandemic and its relationship with personality traits and self-efficacy. The study showed that operators experienced a moderate level of perceived stress. The score on the PSS-10 scale obtained by the Polish emergency number opera-

Table 1

Results of the t-test analysis

	Women		Men		<i>t</i> (98)	<i>p</i>	LLCI	ULCI	<i>d</i> _{Cohen}
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>					
Stress	16.59	6.30	13.68	6.30	2.14	.035	0.21	5.62	.46
Self-efficacy	30.99	3.90	32.81	4.33	-2.09	.039	-3.55	-0.09	.44
Extraversion	11.10	2.69	11.61	2.62	-0.89	.377	-1.66	0.63	.19
Agreeableness	11.57	2.12	11.23	1.56	0.80	.428	-0.51	1.19	.18
Conscientiousness	11.55	2.58	11.13	2.16	0.79	.430	-0.63	1.48	.18
Emotional stability	9.39	2.61	10.94	2.26	-2.85	.005	-2.62	-0.47	.63
Openness to experiences	9.13	1.79	9.65	2.01	-1.28	.204	-1.31	0.28	.27

Table 2*Results of Pearson's r correlation analysis*

	1	2	3	4	5	6	7
1. Stress	–						
2. Self-efficacy	–.70***	–					
3. Extraversion	–.45***	.26**	–				
4. Agreeableness	–.28**	.21*	.48***	–			
5. Conscientiousness	–.42***	.28**	.37***	.39***	–		
6. Emotional stability	–.63***	.47***	.49***	.39***	.40***	–	
7. Openness to experiences	–.32**	.29**	.39***	.31**	.29*	.25*	–

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

*Emergency
number operators
and COVID-19*

Table 3*Results of stepwise regression analysis*

Dependent variable	Predictors	β	SE β	$t(97)$	p	Model summary		
						$F(2, 97)$	p	R^2
Stress	Self-efficacy	–.52	.07	–7.09	< .001	73.33	< .001	.60
	Emotional stability	–.39	.07	–5.31	< .001			

tors was lower compared to the results obtained by Polish doctors (Dymecka et al., 2021a), nurses (Dymecka et al., 2021f), the general population (Dymecka et al., 2021c) or pregnant women (Dymecka et al., 2021b). It can be assumed that emergency number operators do not experience increased stress during the COVID-19 pandemic. It may also be related to the fact that the study was conducted during the second wave of the pandemic and most operators may have already adapted to the more difficult working conditions. Moreover, compared to doctors or nurses, emergency number operators do not come into direct contact with infected people. Additionally, the emergency number operators also worked in a stressful environment before the pandemic (Sikora-Wojtarowicz & Nienartowicz, 2015), so the changes caused by COVID-19 might not have affected them to the same extent as it affected people who did not struggle with difficult situations.

In the study group, the level of perceived stress was associated with all Big Five personality traits. The strongest correlations were between stress and neuroticism and extraversion. As assumed, neuroticism turned out to be the only predictor of perceived stress among Big Five personality traits. Many studies have shown that neuroticism is associated with perceived stress (Afshar et al., 2015; Liu et al., 2021). People with high neuroticism tend to experience a high level of stress. Neuroticism can reflect a per-

son's over-sensitivity, increasing their susceptibility to stress (Afshar et al., 2015; Bondy et al., 2021). Highly neurotic operators may perceive their work environment as more threatening, which in turn leads to negative emotions (Barlow et al., 2014; Schneider, 2004). Researchers show that neuroticism is associated with a greater number of negative psychological reactions, such as greater perceived stress, stronger negative emotionality, and less positive emotionality (Heszen-Niejodek, 2000). Moreover, people with high levels of neuroticism are more likely to feel exhausted due to everyday problems (Bolger & Schilling, 1991; Kammeyer-Mueller et al., 2016; Rathi & Lee, 2016). These people may be characterized by features such as irritability, excessive emotionality, depressed mood or anxiety, all of which may result in feeling more stressed in connection with the performance of professional duties.

Research shows that neurotic individuals are more concerned about the pandemic (Krupić et al., 2021). During the COVID-19 pandemic, people with high neuroticism showed higher levels of perceived threat of COVID-19 and an increased level of negative affect (Kroencke et al., 2020). This may be due to the fact that people with low emotional stability have a general tendency to experience negative emotions (Oleś, 2003). These people more often assess events as stressful (Guthert et al., 1999), experience more stress (Vollrath & Torgersen, 2000), including during a pan-

Table 4

Results of mediation analysis using the PROCESS macro

Path		Symbol	β	<i>b</i>	<i>SE</i>	<i>p</i>	LLCI	ULCI	
X – Extraversion									
X	→	M	a	.26	.40	.15	.009	0.10	0.70
M	→	Y	b	-.62	-.97	.10	< .001	-1.19	-0.76
X (M)	→	Y	c'	-.29	-.70	.17	.001	-1.03	-0.37
Indirect effect of M			a* b	-.16	-.39	.08	-	-0.34	0.01
X – Agreeableness									
X	→	M	a	.21	.45	.20	.032	0.04	0.86
M	→	Y	b	-.67	-1.04	.11	< .001	-1.27	-0.82
X (M)	→	Y	c'	-.14	-.46	.23	.058	-0.93	0.02
Indirect effect of M			a* b	-.14	-.47	.05	-	-0.26	-0.05
X – Conscientiousness									
X	→	M	a	.28	.47	.16	.005	0.15	0.79
M	→	Y	b	-.63	-.98	.11	< .001	-1.20	-0.76
X (M)	→	Y	c'	-.25	-.65	.18	< .001	-1.02	-0.28
Indirect effect of M			a* b	-.18	-.46	.08	-	-0.34	-0.01
X – Emotional stability									
X	→	M	a	.47	.75	.14	< .001	0.47	1.02
M	→	Y	b	-.52	-.81	.11	< .001	-1.03	-0.58
X (M)	→	Y	c'	-.39	-.95	.17	< .001	-1.31	-0.60
Indirect effect of M			a* b	-.24	-.60	.06	-	-0.39	-0.11
X – Openness to experiences									
X	→	M	a	.29	.63	.21	.004	0.20	1.05
M	→	Y	b	-.66	-1.03	.11	< .001	-1.26	-0.80
X (M)	→	Y	c'	-.13	-.46	.25	.075	-0.97	0.05
Indirect effect of M			a* b	-.19	-.65	.08	-	-0.35	-0.02

Note. X – personality trait; M – self-efficacy; Y – stress.

demic, and have problems with adapting to the challenges of COVID-19 (Nikčević & Spada, 2020).

All the Big Five personality traits were also related to self-efficacy. Self-efficacy is a variable related to individual beliefs, so it is not surprising that it is related to the Big Five personality traits. Evidence regarding the relationship of personality and self-efficacy was presented in a meta-analysis by Judge and Ilies (2002), who also found the strongest correlation between self-efficacy and neuroticism and extraversion, while conscientiousness and openness were less associated with SE. Another study found that emotional stability contributed to a higher level of self-efficacy among women (Schmitt, 2007). The present study confirmed the previously obtained results indi-

cating a relationship between personality traits and self-efficacy. It has also been shown that self-efficacy played the role of a mediator between 4 Big Five personality traits and perceived stress. This means that an individual's personality traits may influence the level of self-efficacy that determines how stress is perceived. These results have been confirmed in several other studies, both before and during the pandemic. Research by Ebstrup et al. (2011) showed that the relationship between all five personality traits was mediated by general self-efficacy and the strongest mediating effect was related to extroversion and conscientiousness, but the trait most strongly associated with stress was neuroticism. Another study conducted during the COVID-19 pandemic showed

that neurotic individuals experienced greater stress and anxiety during the COVID-19 pandemic and had a lower level of self-efficacy (Liu et al., 2021). In this research, self-efficacy mediated between four personality traits and perceived stress, and both SE and emotional stability were significant predictors of perceived stress, which is in line with the mentioned literature.

Bandura (1977, 2007) in his socio-cognitive theory emphasizes that in a stressful situation, not so much the characteristics of an individual are important as their competencies and ability to deal with life circumstances. Self-efficacy is defined as a generalized feature of an individual related to the individual's perception of their ability to cope with various areas of life (Juczyński & Juczyński, 2012; Tomczak, 2009). Therefore, it may mediate the relationship between personality traits and stress perceived by emergency telephone number operators.

The concept of Bandura (2007) shows that self-efficacy allows for an accurate assessment of the situation and the search for effective ways of coping with the encountered difficulties. People with high self-efficacy are characterized by relatively stable emotions even under pressure (Bihlmaier & Schlarb, 2016). Low self-efficacy is associated with anxiety and a sense of helplessness, while high self-efficacy is associated with a higher level of positive emotions (Juczyński & Juczyński, 2012; Bidzan et al., 2020). Self-efficacy is considered a significant personal resource important for coping with difficult situations (Byra, 2011). The level of self-efficacy may influence whether an individual will make efforts to cope with the circumstances that have arisen (Bandura, 1977). It is also a resource that increases an individual's resistance to stress (Bandura, 1982, 1989; Schwarzer, 1997). Even very burdensome tasks do not paralyze people with a high level of self-efficacy, because in a stressful situation these individuals look for new solutions, mobilize, transform the situation and adapt to unfavourable circumstances (Bandura, 1977). People with a strong belief in their own effectiveness believe that they can cope with difficulties, while people with low self-efficacy are not sure of their own abilities, which is associated with low motivation to act and little willingness to take up challenges (Oleś, 2003).

People with high self-efficacy prefer effective coping strategies (Jachimowicz & Kostka, 2009; Juczyński, 1998) and have greater control over disturbing thoughts (Bandura, 1997). On the other hand, in people with a low level of self-efficacy, the coping strategies are more often ineffective. Self-efficacy in coping with adversities is also associated with the belief that the strategies will bring the intended results. This resource is involved in the assessment of coping strategies and influences the selection of those that will be most useful in coping (Byra, 2011). People with low self-efficacy focus on their deficiencies, on the

barriers they will encounter and on predicting possible failures. Such people quickly give up in the face of difficulties, and after failure, they break down and therefore quickly fall into depression and a sense of hopelessness (Bandura, 1993). People with high self-efficacy are less depressed than those who think they will not be able to cope. They experience less stress and anxiety because they perceive the environment as less threatening (Bandura, 1997). People with high self-efficacy are more likely to experience positive emotions, which is particularly important taking into account the fact that negative emotions make it difficult to perform tasks and affect the assessment of the situation as stressful (Kościelak, 2010).

Self-efficacy is a resource influencing professional functioning. According to Schwarzer and Taubert (1999), low SE may be associated with stress, anxiety, depression and helplessness. Therefore, self-efficacy plays a key role in managing stress and burnout. Studies on a group of physicians found that people with a high level of self-efficacy are less burned out (Kulik, 2008). It has also been shown that there is a relationship between the level of self-efficacy and mental health and coping in nurses. In addition, there are reports that self-efficacy protects against emotional exhaustion and has an impact on life satisfaction (Andruszkiewicz et al., 2011), quality of life (Dymecka et al., 2021e) and well-being (Krok & Gerymski, 2019, 2021). Self-efficacy is a very important resource during the struggle of emergency number operators with the successive waves of the COVID-19 pandemic. People with a high level of this resource more effectively cope with the changes related to the pandemic, and health care workers with high SE perceived stress as lower (Shahrour & Dardas, 2020; Peñacoba et al., 2021) and cope better with stress and anxiety related to COVID-19 (Bidzan et al., 2020). Therefore, it can be concluded that self-efficacy is a very important resource that allows the emergency telephone number operators to effectively perform their duties during the crisis related to the COVID-19 pandemic.

Although our study produced important results, it is not free of limitations. Our mediation model is tested as causal, but it does not allow us to establish cause and effect relationships, due to the cross-sectional nature of our data. It would require longitudinal studies to confirm whether the proposed direction of the influence is correct. In addition, it would be worth analysing the role of other resources important for coping with stress, such as a sense of coherence, resiliency or hardiness (Dymecka et al., 2021d), in the emergency telephone number operators. Also, future studies on emergency telephone number operators should measure Big Five personality traits with different, more reliable questionnaires, such as IPIP-BFM-50 (Strus et al., 2014).

In summary, the study demonstrated the importance of personality traits and self-efficacy in the

perception of stress by emergency number operators during the COVID-19 pandemic. Self-efficacy was found to be a mediator between 4 Big Five personality traits and perceived stress. Operators with a high SE level experience less stress, and therefore it can be assumed that this resource is especially important for professional functioning and coping with the effects of a pandemic. Self-efficacy can be a resource related to effective adaptation to changes that occurred during a pandemic. As many studies have shown, it is an important resource for the entire population, but also for professional groups exposed to the effort of fighting with the pandemic or other crises. The present study confirms these relationships and extends the available literature with data on emergency phone number operators.

Joanna Dymecka,
Robert Tarczyński,
Rafał Gerymski

REFERENCES

- Afshar, H., Roohafza, H. R., Keshteli, A. H., Mazaheiri, M., Feizi, A., & Adibi, P. (2015). The association of personality traits and coping styles according to stress level. *Journal of Research in Medical Sciences, 20*, 353–358.
- Andruszkiewicz, A., Banaszekiewicz, M., Felsmann, M., Marzec, A., Kielbratowska, B., & Kocięcka, A. (2011). Poczucie własnej skuteczności a wybrane zmienne związane z funkcjonowaniem zawodowym w grupie pielęgniarek [The sense of self-efficacy and selected occupational functioning related variables in the group of nurses]. *Problemy Pielęgniarstwa, 19*, 143–147.
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavior change. *Psychological Review, 84*, 191–215. <https://doi.org/10.1037/0033-295X.84.2.191>
- Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist, 37*, 122–147. <https://doi.org/10.1037/0003-066X.37.2.122>
- Bandura, A. (1989). Regulation of cognitive processes through perceived self-efficacy. *Developmental Psychology, 25*, 729–735. <https://doi.org/10.1037/0012-1649.25.5.729>
- Bandura, A. (1993). Perceived self-efficacy in cognitive development and functioning. *Educational Psychologist, 28*, 117–148. https://doi.org/10.1207/s15326985ep2802_3
- Bandura, A. (1997). Self-efficacy. *Harvard Mental Health Letter, 13*, 4–6.
- Bandura, A. (2007). *Teoria społecznego uczenia się* [Social learning theory]. Wydawnictwo Naukowe PWN.
- Barlow, D. H., Ellard, K. K., Sauer-Zavala, S., Bullis, J. R., & Carl, J. R. (2014). The origins of neuroticism. *Perspectives on Psychological Science, 9*, 481–496. <https://doi.org/10.1177/1745691614544528>
- Benight, C. C., Swift, E., Sanger, J., Smith, A., & Zepelin, D. (1999). Coping self-efficacy as a mediator of distress following a natural disaster. *Journal of Applied Social Psychology, 29*, 2443–2464. <https://doi.org/10.1111/j.1559-1816.1999.tb00120.x>
- Benight, C. C., & Harper, M. L. (2002). Coping self-efficacy perceptions as a mediator between acute stress response and long-term distress following natural disasters. *Journal of Traumatic Stress, 15*, 177–186. <https://doi.org/10.1023/A:1015295025950>
- Bidzan, M., Bidzan-Bluma, I., Szulman-Wardal, A., Stueck, M., & Bidzan, M. (2020). Does self-efficacy and emotional control protect hospital staff from COVID-19 anxiety and PTSD symptoms? Psychological functioning of hospital staff after the announcement of COVID-19 coronavirus pandemic. *Frontiers in Psychology, 11*, 552583. <https://doi.org/10.3389/fpsyg.2020.552583>
- Bihlmaier I., & Schlarb, A. A. (2016). Self-efficacy and sleep problems. *Somnologie, 20*, 275–280. <https://doi.org/10.1007/s11818-016-0085-1>
- Bolger, N., & Schilling, E. A. (1991). Personality and the problems of everyday life: The role of neuroticism in exposure and reactivity to daily stressors. *Journal of Personality, 59*, 355–386. <https://doi.org/10.1111/j.1467-6494.1991.tb00253.x>
- Bolger, N., & Zuckerman, A. (1995). A framework for studying personality in the stress process. *Journal of Personality and Social Psychology, 69*, 890–902. <https://doi.org/10.1037//0022-3514.69.5.890>
- Bondy, E., Baranger, D. A., Balbona, J., Sputo, K., Paul, S. E., Oltmanns, T. F., & Bogdan, R. (2021). Neuroticism and reward-related ventral striatum activity: Probing vulnerability to stress-related depression. *Journal of Abnormal Psychology, 130*, 223–235. <https://doi.org/10.1037/abn0000618>
- Byra, S. (2011). Poczucie własnej skuteczności w kontekście radzenia sobie w sytuacjach trudnych kobiet i mężczyzn z nabytą niepełnosprawnością ruchową [Sense of self-efficacy in the context of coping in difficult situations among females and males with acquired motor disability]. *Medycyna Ogólna i Nauki o Zdrowiu, 17*, 127–134.
- Caviglia, M., Buson, R., Pini, S., Jambai, A., Vandy, M. J., Venturini, F., Rosi, P., Barone-Adesi, F., Della Corte, F., Ragazzoni, L., & Putoto, G. (2020). The national emergency medical service role during the COVID-19 pandemic in Sierra Leone. *Prehospital and Disaster Medicine, 35*, 693–697. <https://doi.org/10.1017/S1049023X20001211>
- Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior, 24*, 385–396. <https://doi.org/10.2307/2136404>
- Dymecka, J. (2021). Psychosocial effects of the COVID-19 pandemic. *Neuropsychiatry and Neuropsychology, 16*, 1–10. <https://doi.org/10.5114/nan.2021.108030>
- Dymecka, J., Filipkowski, J., & Machnik-Czerwik, A. (2021a). Fear of COVID-19: Stress and job satisfac-

- tion among Polish doctors during the pandemic. *Advances in Psychiatry and Neurology*, 30, 243–250. <https://doi.org/10.5114/ppn.2021.111935>
- Dymecka, J., Gerymski, R., Iszczuk, A., & Bidzan, M. (2021b). Fear of coronavirus, stress and fear of childbirth in Polish pregnant women during the COVID-19 pandemic. *International Journal of Environmental Research and Public Health*, 18, 13111. <https://doi.org/10.3390/ijerph182413111>
- Dymecka, J., Gerymski, R., & Machnik-Czerwik, A. (2021c). Fear of COVID-19 as a buffer in the relationship between perceived stress and life satisfaction in the Polish population at the beginning of the global pandemic. *Health Psychology Report*, 9, 149–159. <https://doi.org/10.5114/hpr.2020.102136>
- Dymecka, J., Gerymski, R., Machnik-Czerwik, A., Derbis, R., & Bidzan, M. (2021d). Fear of COVID-19 and life satisfaction: The role of the health-related hardiness and sense of coherence. *Frontiers in Psychiatry*, 12, 712103. <https://doi.org/10.3389/fpsy.2021.712103>
- Dymecka, J., Gerymski, R., Tataruch, R., & Bidzan, M. (2021e). Fatigue, physical disability and self-efficacy as predictors of the acceptance of illness and health-related quality of life in patients with multiple sclerosis. *International Journal of Environmental Research and Public Health*, 18, 13237. <https://doi.org/10.3390/ijerph182413237>
- Dymecka, J., Machnik-Czerwik, A., & Filipkowski, J. (2021f). Fear of COVID-19, risk perception and stress level in Polish nurses during COVID-19 outbreak. *The Journal of Neurological and Neurosurgical Nursing*, 10, 3–9. <https://doi.org/10.15225/PNN.2021.10.1.1>
- Ebstrup, J. F., Eplov, L. F., Pisinger, C., & Jørgensen, T. (2011). Association between the Five Factor personality traits and perceived stress: Is the effect mediated by general self-efficacy? *Anxiety, Stress, and Coping*, 24, 407–419. <https://doi.org/10.1080/10615806.2010.540012>
- Gosling, S. D., Rentfrow, P. J., & Swann, W. B. Jr. (2003). A very brief measure of the Big-Five personality domains. *Journal of Research in Personality*, 37, 504–528. [https://doi.org/10.1016/S0092-6566\(03\)00046-1](https://doi.org/10.1016/S0092-6566(03)00046-1)
- Guthert, K. C., Cohen, L. H., & Armeli, S. (1999). Role of neuroticism in daily stress and coping. *Journal of Personality and Social Psychology*, 77, 1087–1100. <https://doi.org/10.1037//0022-3514.77.5.1087>
- Hayes, A. F. (2017). *Introduction to mediation, moderation, and conditional process analysis: a regression-based approach*. Guilford Publications.
- Heszen-Niejodek, I. (2000). Teoria stresu psychologicznego i radzenia sobie [The theory of psychological stress and coping]. In J. Strelau (Ed.), *Psychologia. Podręcznik akademicki. Jednostka w społeczeństwie i elementy psychologii stosowanej* [Psychology. Academic textbook. The individual in society and elements of applied psychology] (pp. 465–492). Gdańskie Wydawnictwo Psychologiczne.
- Ho, S. M. Y., Kwong-Lo, R. S. Y., Mak, C. W. Y., & Wong, J. S. (2005). Fear of severe acute respiratory syndrome (SARS) among health care workers. *Journal of Consulting and Clinical Psychology*, 73, 344–349. <https://doi.org/10.1037/0022-006X.73.2.344>
- Jachimowicz, V., & Kostka, T. (2009). Ocena poczucia własnej skuteczności u pensjonariuszy domu pomocy społecznej [Assessment of self-efficacy in the residents of older people home]. *Gerontologia Polska*, 17, 23–31.
- Juczyński, Z. (1998). Poczucie własnej skuteczności jako wyznacznik zachowań zdrowotnych [Self-efficacy as a determinant of health behaviors]. *Promocja Zdrowia. Nauki Społeczne i Medycyna*, 14, 54–63.
- Juczyński, Z. (2001). *Narzędzia pomiaru w promocji i psychologii zdrowia* [Measurement tools in health promotion and psychology]. Pracownia Testów Psychologicznych PTP.
- Juczyński, Z., & Juczyński, A. (2012). „Chcieć to móc”, czyli o znaczeniu poczucia własnej skuteczności w modyfikacji zachowań związanych z pićm alkoholu [“To want to be able” – the importance of self-efficacy in behaviour modification in regard to alcohol consumption]. *Alkoholizm i Narkomania*, 25, 215–227.
- Juczyński, Z., & Oginska-Bulik, N. (2009). *Narzędzia pomiaru stresu i radzenia sobie ze stresem* [Tools for measuring stress and coping with stress]. Pracownia Testów Psychologicznych PTP.
- Judge, T. A., & Ilies, R. (2002). Relationship of personality to performance motivation: a meta-analytic review. *Journal of Applied Psychology*, 87, 797–807. <https://doi.org/10.1037/0021-9010.87.4.797>
- Kammeyer-Mueller, J. D., Simon, L. S., & Judge, T. A. (2016). A head start or a step behind? Understanding how dispositional and motivational resources influence emotional exhaustion. *Journal of Management*, 42, 561–581. <https://doi.org/10.1177/0149206313484518>
- Kościelak, R. (2010). *Poczucie umiejscowienia kontroli i przekonania o własnej skuteczności w zdrowiu i w chorobie* [The feeling of having control and self-efficacy in health and disease]. Oficyna Wydawnicza Impuls.
- Kroencke, L., Geukes, K., Utesch, T., Kuper, N., & Back, M. D. (2020). Neuroticism and emotional risk during the COVID-19 pandemic. *Journal of Research in Personality*, 89, 104038. <https://doi.org/10.1016/j.jrp.2020.104038>
- Krok, D., & Gerymski, R. (2019). Self-efficacy as a mediator of the relationship between meaning in life and subjective well-being in cardiac patients. *Current Issues in Personality Psychology*, 7, 242–251. <https://doi.org/10.5114/cipp.2019.89168>
- Krok, D., & Gerymski, R. (2021). Affect and psychological well-being in partners of cancer patients:

- The mediating role of meaning in life and self-efficacy. *Family Forum*, 11, 267–286. <https://doi.org/10.25167/FF/3806>
- Krupić, D., Žuro, B., & Krupić, D. (2021). Big Five traits, approach-avoidance motivation, concerns and adherence with COVID-19 prevention guidelines during the peak of pandemic in Croatia. *Personality and Individual Differences*, 179, 110913. <https://doi.org/10.1016/j.paid.2021.110913>
- Kulik, M. M. (2008). Cierpienie, które przerasta, czyli o wypaleniu lekarzy pracujących z ludźmi przewlekle chorymi [A suffering that exceeds – the burnout of doctors working with chronically ill people]. *Studia z psychologii w KUL*, 15, 81–112.
- Lee, S. A., Jobe, M. C., Mathis, A. A., & Gibbons, J. A. (2020). Incremental validity of coronaphobia: Coronavirus anxiety explains depression, generalized anxiety, and death anxiety. *Journal of Anxiety Disorders*, 74, 102268. <https://doi.org/10.1016/j.janxdis.2020.102268>
- Liu, S., Lithopoulos, A., Zhang, C. Q., Garcia-Barreira, M. A., & Rhodes, R. E. (2021). Personality and perceived stress during COVID-19 pandemic: Testing the mediating role of perceived threat and efficacy. *Personality and Individual Differences*, 168, 110351. <https://doi.org/10.1016/j.paid.2020.110351>
- Luszczynska, A., Scholz, U., & Schwarzer, R. (2005). The General Self-Efficacy Scale: Multicultural validation studies. *The Journal of Psychology*, 139, 439–457. <https://doi.org/10.3200/JRLP.139.5.439-457>
- Maciejewski, P. K., Prigerson, H. G., & Mazure, C. M. (2000). Self-efficacy as a mediator between stressful life events and depressive symptoms: Differences based on history of prior depression. *The British Journal of Psychiatry*, 176, 373–378. <https://doi.org/10.1192/bjp.176.4.373>
- McCrae, R. R., & Costa, P. T., Jr. (2005). *Osobowość dorosłego człowieka* [Personality in adulthood]. Wydawnictwo WAM.
- McCrae, R., & Costa, P. (2008). The five-factor theory of personality. In O. John, R. Robins, & L. Pervin (Eds.), *Handbook of personality. Theory and research* (pp. 159–181). Guilford Press.
- Mnich, T. (2020). *Zgłoszenia alarmowe związane z COVID-19* [Emergency reports related to COVID-19]. Retrieved from <https://www.gov.pl/web/numer-alarmowy-112/zgloszenia-alarmowe-zwiazane-z-covid-19>
- Nikčević, A. V., Marino, C., Kolubinski, D. C., Leach, D., & Spada, M. M. (2021). Modelling the contribution of the Big Five personality traits, health anxiety, and COVID-19 psychological distress to generalised anxiety and depressive symptoms during the COVID-19 pandemic. *Journal of Affective Disorders*, 279, 578–584. <https://doi.org/10.1016/j.jad.2020.10.053>
- Nikčević, A. V., & Spada, M. M. (2020). The COVID-19 anxiety syndrome scale: Development and psychometric properties. *Psychiatry Research*, 292, 113322. <https://doi.org/10.1016/j.psychres.2020.113322>
- Oleś, P. (2003). *Wprowadzenie do psychologii osobowości* [Introduction to personality psychology]. Scholar.
- Peñacoba, C., Catala, P., Velasco, L., Carmona-Monge, F. J., Garcia-Hedrerera, F. J., & Gil-Almagro, F. (2021). Stress and quality of life of intensive care nurses during the COVID-19 pandemic: Self-efficacy and resilience as resources. *Nursing in Critical Care*, 26, 493–500. <https://doi.org/10.1111/nicc.12690>
- Pervin, L. A., & John, P. O. (2001). *Psychologia osobowości* [Personality psychology]. Gdańskie Wydawnictwo Psychologiczne.
- Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, 40, 879–891. <https://doi.org/10.3758/BRM.40.3.879>
- Rathi, N., & Lee, K. (2016). Emotional exhaustion and work attitudes: Moderating effect of personality among frontline hospitality employees. *Journal of Human Resources in Hospitality & Tourism*, 15, 231–251. <https://doi.org/10.1080/15332845.2016.1147935>
- Schmitt, N. (2007). The interaction of neuroticism and gender and its impact on self-efficacy and performance. *Human Performance*, 21, 49–61. <https://doi.org/10.1080/08959280701522197>
- Schneider, T. R. (2004). The role of neuroticism on psychological and physiological stress responses. *Journal of Experimental Social Psychology*, 40, 795–804. <https://doi.org/10.1016/j.jesp.2004.04.005>
- Schwarzer, R. (1997). Poczucie własnej skuteczności w podejmowaniu i kontynuacji zachowań zdrowotnych. Dotychczasowe podejścia teoretyczne i nowy model [Self-efficacy in undertaking and continuing health behaviors. Previous theoretical approaches and a new model]. In I. Haszen-Niejoдек & H. Sęk (Eds.), *Psychologia zdrowia* [Health psychology] (pp. 175–205). PWN.
- Schwarzer, R., & Jerusalem, M. (1995). Generalized Self-Efficacy Scale. In J. Weinman, S. Wright, & M. Johnston (Eds.), *Measures in health psychology: a user's portfolio. Causal and control beliefs* (pp. 35–37). NFER-Nelson.
- Schwarzer, R., & Taubert, S. (1999). Radzenie sobie ze stresem. Wymiary i procesy [Coping with stress. Dimensions and processes]. *Promocja Zdrowia. Nauki Społeczne i Medycyna*, 6, 72–92.
- Shahrour, G., & Dardas, L. A. (2020). Acute stress disorder, coping self-efficacy and subsequent psychological distress among nurses amid COVID-19. *Journal of Nursing Management*, 28, 1686–1695. <https://doi.org/10.1111/jonm.13124>
- Sikora-Wojtarowicz, K., & Nienartowicz, A. (2015). Funkcjonowanie systemu powiadamiania ratunkowego w Polsce. Założenia i praktyka [Operation of the emergency notification system in Poland.

- Assumptions and practice]. *Rocznik Bezpieczeństwa Międzynarodowego*, 9, 220–237. <https://doi.org/10.34862/rbm.2015.2.15>
- Sorokowska, A., Słowińska, A., Zbieg, A., & Sorokowski, P. (2014). *Polska adaptacja testu Ten Item Personality Inventory (TIPI) – TIPI-PL – wersja standardowa i internetowa* [The Polish adaptation of the Ten Item Personality Inventory (TIPI) – TIPI-PL – standard and internet version]. WrocLab.
- Strus, W., Ciecuch, J., & Rowiński, T. (2014). The Polish adaptation of the IPIP-BFM-50 questionnaire for measuring five personality traits in the lexical approach. *Roczniki Psychologiczne*, 17, 347–366.
- Tomczak, K. (2009). Style radzenia sobie w sytuacji stresowej, przekonanie o własnej skuteczności, nadzieja na sukces u studentów rozpoczynających i kończących studia [Style of coping with stress, conviction with self-efficacy and hope for success amongst first-year and last-year university students]. *Psychoterapia*, 149, 67–79.
- Vollrath, M., & Torgersen, S. (2000). Personality types and coping. *Personality and Individual Differences*, 29, 367–378. [https://doi.org/10.1016/S0191-8869\(99\)00199-3](https://doi.org/10.1016/S0191-8869(99)00199-3)
- Wałek, T. (2016). System powiadamiania ratunkowego w Polsce. Założenia i praktyka [Emergency system in Poland. Terms of reference and practice]. *Security, Economy & Law*, 1, 187–195.
- Wang, Y., Yao, L., Liu, L., Yang, X., Wu, H., Wang, J., & Wang, L. (2014). The mediating role of self-efficacy in the relationship between Big Five personality and depressive symptoms among Chinese unemployed population: a cross-sectional study. *BMC Psychiatry*, 14, 1–8. <https://doi.org/10.1186/1471-244X-14-61>
- World Health Organization (2022). *Coronavirus disease (COVID-19) weekly epidemiological update and weekly operational update*. Retrieved from <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports>