

How do threat to life and state anxiety disturb the psychological functioning of Polish adults during coronavirus pandemic?

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Summary

Aim. The aim of this study was to answer the following question: how do threat to life and state anxiety predict psychological functioning in the COVID-19 pandemic among Polish adults aged 18–65 years?

Material and methods. The web-based cross-sectional survey was applied to 1,466 Polish respondents (1,074 women; 73.3%) aged 18–65 years. They were divided into four age groups (18–25; 26–35; 36–45; 46–65 years). All participants completed the following questionnaires: *General Functioning Questionnaire* (GFQ), *State Anxiety Inventory* (STAI-S) and *General Sense of Threat to Life Scale* (GSTLS).

Results. The youngest adults (aged 18–25 years) manifested significantly higher psychological distress, state anxiety and a sense of threat to life compared to all the older participants. A sense of threat to life and state anxiety were significant predictors of psychological distress during the COVID-19 epidemic, whereas state anxiety mediated the relation between “threat to life” and “psychological distress”.

Conclusions. The results of the study indicate that the youngest participants constitute a risk group for the most severe psychological difficulties. The COVID-19 psychological distress could be significantly predicted by the two kinds of emotional states: threat to life and state anxiety.

Key words: COVID-19, psychological distress, anxiety

Introduction

The coronavirus pandemic is widely recognized by researchers as a potentially traumatic stress stimulus [1–3], or as being coupled with a specific type of experience: existential anxiety, death anxiety, or existential fears and terror [4]. Such strong and

overwhelming experience may make coping with anxiety impossible and increase the use of defense reactions [4]. When people are confronted with the fragility of life, they experience most of all death-related anxiety [5, 6]. Framing COVID-19 as an existential threat is linked with anxious arousal and can place people at risk for developing psychological distress or even anxiety disorders [7].

The outbreak of the COVID-19 pandemic is generally associated with an increased risk of psychopathological symptoms, notably, anxiety disorders and depression [1–3, 8–13]. In March and April 2020, the prevalence of anxiety related to COVID-19 was high in Poland [14, 15] and the level of depression was increasing over this period [16]. The results of previous studies show that young people, including young Poles, are more vulnerable to psychological stress, anxiety and depression, compared to the older population [8, 12–14, 17, 18]. The first goal of our study was to investigate the forms of psychological distress and to determine how intense was the sense of threat to life and state anxiety among Poles in different age groups during the outbreak of the pandemic. We also focused on the associations between the sense of threat to life, state anxiety and psychological distress related to COVID-19. In particular, we wanted to examine correlations between the sense of threat to life and psychological distress, and how this relationship may be mediated by state anxiety.

The relationship between the sense of threat to life and the adaptive anxiety response (state anxiety) seems obvious, while with regard to the unusual, completely new situation of the COVID-19 pandemic, it has not yet been scientifically explained. Therefore, this relationship requires exploration, especially as it concerns a very complex, three-dimensional phenomenon of threat, relating to: the sense of threat to the lives of significant others, one's own life and the stability of the world. We can assume that state anxiety will be a significant predictor of whether the COVID-19 sense of threat will trigger the subject's responses that will either be non-adaptive, or remain consistent with the normative functioning.

Material and method

Participants and procedure

The web-based cross-sectional survey was organized and carried out through an online survey uploaded into Qualtrics – online survey platform between April 1 and April 23, 2020. The study involved 1,466 adult Poles aged 18–65 years living in Poland: 1,074 women (73.3%) and 392 men (26.7%). Participants were invited through social media. Participation was anonymous, completely voluntary and free of charge. Completing the entire study took an average of 30 minutes. The study was approved by the Ethics Committee of Faculty of Education at the University of Białystok (decision of 31.03.2020).

Measures

1. Sociodemographic variables. The research form included questions regarding the following demographic factors: sex, age, education, place of residence, and marital status. In addition the respondents were questioned about the coronavirus infection.
2. *General Functioning Questionnaire* (GFQ). The questionnaire is a screening tool to assess the level of general functioning and the severity of psychopathological symptoms [19]. The GFQ consists of thirteen scales including 58 items. In the present study, the items that were considered potentially psychologically aggravating and too time-consuming were excluded (scales for testing productive symptoms, eating disorders, sexual disorders). Finally, eight scales were used: Lack of entertainment (Cronbach's $\alpha = 0.81$), Cognitive impairments ($\alpha = 0.76$), Addictions ($\alpha = 0.72$), Depressive symptoms ($\alpha = 0.76$), Manic symptoms ($\alpha = 0.65$), Anxiety symptoms ($\alpha = 0.83$), Sleep problems ($\alpha = 0.86$), Somatic symptoms ($\alpha = 0.70$) – 39 items in total. High scores indicate a negative overall functioning and the presence of pathological symptoms. In the present study, the GFQ had excellent internal consistency reliability in the entire group of participants ($\alpha = 0.92$).
3. *State Anxiety Inventory* (STAI-S). The STAI-S includes 20 items to evaluate how participants feel about anxiety at the present moment. The items are rated on a four-point Likert scale, ranging from 1 (“not at all”) to 4 (“very much so”). Higher scores indicate greater anxiety levels. The tool has high reliability and validity [20, 21]. Internal consistency for the inventory in the present study was excellent (Cronbach's $\alpha = 0.95$).

The STAI-S and GFQ are tools used for exploration of two different constructs related to the anxiety phenomenon. The STAI-S measures levels of anxiety in circumstances objectively inappropriate for the well-being and safety of an individual (state anxiety). This means that the STAI focuses on anxiety understood as an adaptive form of coping with difficulties. On the other hand, the anxiety disorders subscale in the GFQ provides information that goes beyond the normative perception of anxiety, as it indicates psychopathological mechanisms of behavior. This means that the GFQ measures the severity of anxiety symptoms, which not only are not protective, but can also cause discomfort and suffering to the subject.

4. *General Sense of Threat to Life Scale* (GSTLS). The GSTLS is a 10-item tool for assessing the intensity of a sense of threat to life. It was constructed and developed with regard to the COVID-19 pandemic. Participants ranged the extent to which they agreed with each item on a 7-point Likert scale, rating from 0 (“strongly disagree”) to 6 (“strongly agree”). Exploratory factor analysis revealed three structures: (1) threat to life of significant others (TLSO), (2) threat to world stability, (3) threat to one's own life. All the factors explain 68.53% of the variance, including the variance of each factor: respectively, 48.93%; 10.80%; 8.79%. The following scales showed good internal consistency: the full GSTLS ($\alpha = 0.88$); and the first

two subscales ($\alpha_1 = 0.87$; $\alpha_2 = 0.78$), while the third subscale showed acceptable reliability ($\alpha_3 = 0.70$).

Statistical analysis

The main statistical analyzes concerned the determination of the mediation model, which was performed using bootstrap method (developed in order to reduce Type I error rates). The indirect effects were computed with 5,000 interactions of bootstrapping and 95% confidence intervals. Statistical significance was determined if the confidence intervals did not include zero. Analyses were performed with IBM SPSS Statistics 26. The hypotheses of the study are presented in the mediation model based on Model 4 for Process macro v3.5 developed by Andrew F. Hayes [22]. Preliminary analysis was performed using one-way ANOVA with post-hoc Bonferroni test.

Results

Demographic characteristics

The subjects were divided into 4 age groups: people entering adulthood (18–25 years), young adults (26–35 years), people in middle adulthood (36–45 years) and people in later adulthood (46–65 years). The characteristics of the respondents can be found in Table 1. None of the participants reported a coronavirus infection.

Table 1. Sociodemographic data in particular age groups (N = 1,466)

Variables	Age groups			
	18–25 n = 504	26–35 n = 492	36–45 n = 263	46–65 n = 207
Biological sex, n (%)				
Female	394 (78.2)	377 (76.6)	181 (68.8)	122 (58.9)
Male	110 (21.8)	115 (23.4)	82 (31.2)	85 (41.1)
Education, n (%)				
Primary	6 (1.2)	1 (0.2)	1 (0.4)	8 (3.9)
Secondary	270 (53.6)	53 (10.8)	25 (9.5)	27 (13)
Higher	228 (45.2)	438 (89)	237 (90.1)	172 (83.1)
Marital status, n (%)				
Single	257 (51)	146 (29.7)	40 (15.2)	18 (8.7)
In a relationship	234 (46.4)	135 (27.4)	29 (11)	13 (6.3)
Married	12 (2.4)	195 (39.6)	171 (65)	133 (64.3)
Divorced	1 (0.2)	14 (2.8)	23 (8.7)	32 (15.5)
Widowed	0	2 (0.4)	0	11 (5.3)

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Place of residence, n (%)				
Rural	105 (20.8)	58 (11.8)	33 (12.5)	30 (14.5)
Rural-urban (up to 50,000 inhabitants)	91 (18)	96 (19.5)	63 (24)	43 (20.8)
Urban (over 50,000 inhabitants)	308 (61.2)	338 (68.7)	167 (63.5)	134 (64.7)

Preliminary Analyses

Significant differences between the threat to life, state anxiety and psychological distress are presented in Table 2.

Table 2. Comparison of age groups in terms of the variables of interest (N = 1,466)

Variables	Age groups								Significance of differences-		
	(18-25) n ₁ = 504		(26-35) n ₂ = 492		(36-45) n ₃ = 263		(46-65) n ₄ = 207		F(3, 1462)	p	Age groups*
	M	SM	M	SM	M	SM	M	SM			
General sense of threat to live	3.30	1.33	3.11	1.28	2.99	1.26	2.99	1.22	4.78	0.003	1-3; 1-4
Threat to life of significant others	4.20	1.75	4.05	1.77	3.81	1.73	3.74	1.61	4.90	0.002	1-3; 1-4
Threat to world stability	3.29	1.57	2.97	1.47	2.83	1.43	2.88	1.39	7.75	0.001	1-2; 1-3; 1-4
Threat to one's own life	2.41	1.35	2.32	1.30	2.34	1.24	2.34	1.24	0.40	0.752	-
State anxiety	43.97	12.01	43.12	12.25	42.52	11.97	42.03	11.99	1.61	0.186	-
Psychological distress	2.18	0.50	2.03	0.52	1.94	0.48	1.85	0.43	25.69	0.001	1-2; 1-3; 1-4; 2-4
Cognitive impairments	2.63	0.95	2.27	0.91	2.17	0.85	2.03	0.69	31.11	0.001	1-2; 1-3; 1-4; 2-4
Addictions	1.35	0.58	1.32	0.56	1.27	0.45	1.24	0.41	2.47	0.060	-
Depressive symptoms	2.20	0.72	2.09	0.74	1.95	0.64	1.89	0.56	13.73	0.001	1-2; 1-3; 1-4; 2-4

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Manic symptoms	2.18	0.66	1.96	0.59	1.87	0.62	1.79	0.53	27.24	0.001	1-2; 1-3; 1-4; 2-4
Anxiety symptoms	2.12	0.74	2.03	0.76	1.88	0.65	1.79	0.57	13.67	0.001	1-3; 1-4; 2-3; 2-4
Sleep problems	2.33	1.03	2.03	0.98	1.92	0.89	1.93	0.94	15.02	0.001	1-2; 1-3; 1-4
Somatic symptoms	1.87	0.72	1.79	0.74	1.76	0.70	1.68	0.67	3.98	0.008	1-4

*p < 0.05

The obtained results showed that in the all variables of our interests the youngest participants got the highest mean scores. The differences between the four age groups turned out significant in all the variables apart from state anxiety, threat to one's own life and addictions.

Main Analyses

The main object of the study was to test the hypothetical simple mediation model with state anxiety as a mediator, general threat to life as an independent variable, and psychological distress as a dependent variable. The outcomes of statistical analyses showed that for all participants there was a significantly positive indirect relationship between a general sense of threat to life and psychological distress, mediated by state anxiety (see table 3; Figure 1).

Table 3. Model of state anxiety mediation in the relationship between a general sense of threat to life and psychological distress

Predictors	Outcome					
	M – State anxiety			Y – Psychological distress		
	B	SE B	p	B	SE B	p
General sense of threat to live	5.70	0.23	0.001	0.12	0.01	0.001
State anxiety	–	–	–	0.02	0.001	0.001
Constant	25.63	0.82	0.001	0.77	0.04	0.001
	R ² = 0.37			R ² = 0.50		
	F(1, 1,072) = 627.08, p < 0.001			F(2, 1,071) = 534.65, p < 0.001		
95% Confidence Interval						

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Indirect effect	B	Boot SE	Lower Limit	Upper Limit
Total effect	0.2349	0.0098	0.2157	0.2542
Direct effect	0.1164	0.0108	0.0951	0.1376
Indirect effect	0.1185	0.0081	0.1029	0.1348

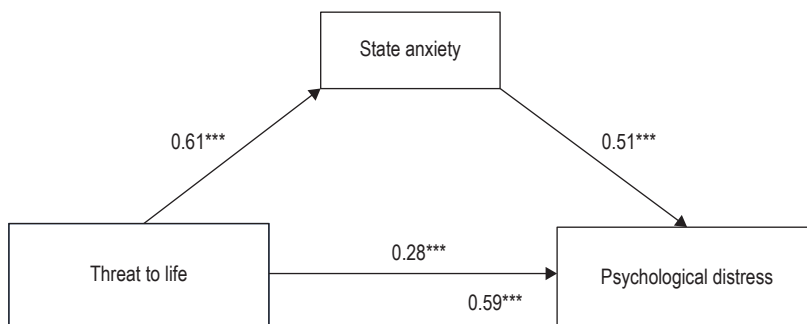


Figure 1. Mediation model results (standardized coefficients)

***p <0.001 (two-tailed significance)

The mediation model for the entire group of participants accounted for 51% of variance of psychological distress. The more specific statistical analyses conducted separately for each of seven subscales of the GHQ showed a significant positive relationship between individual disturbances in mental functioning and a sense of threat to life, mediated by state anxiety. This effect did not occur only in the case of the addiction subscale (IE = 0.0107, 95% CI = [-0.0069, 0.0281]). Interestingly, in the case of four variables: depressive symptoms (indirect effect IE = 0.1961, 95% CI = [0.1746, 0.2180]; total effect (TE = 0.2996, 95% CI = [0.2765, 0.3227]), cognitive impairments (IE = 0.1654, 95% CI = [0.1380, 0.1932]; TE = 0.2808, 95% CI = [0.2765, 0.3227]), sleep problems (IE = 0.1679, 95% CI = [0.1370, 0.1992]; TE = 0.2946, 95% CI = [0.2584, 0.3309]), and somatic symptoms (IE = 0.1277, 95% CI = [0.1059, 0.1503]; TE = 0.2538, 95% CI = [0.2284, 0.2793]), the mediation model accounted for the highest percentage of variance: 65.45%, 58.90%, 56.99%, and 50.31%, respectively. The two other subscales of the GHQ: anxiety symptoms (IE = 0.1221, 95% CI = [0.1051, 0.1399]; TE = 0.3870, 95% CI = [0.3666, 0.4074]) and manic symptoms (IE = 0.0210, 95% CI = [0.0013, 0.0409]; TE = 0.1569, 95% CI = [0.1333, 0.1804]) in the simple model were explained respectively by 31.55% and 13.38% of its variance.

Discussion

The main goal of the present study was to answer the following question: how do threat to life and state anxiety disturb psychological functioning in the coronavirus

pandemic among Polish adults aged 18–65 years? The highest mean scores of psychological distress was obtained by the youngest participants aged 18–25. It could mean that the unexpected situation of epidemic outbreak had likely the strongest impact on them, although it was generally believed that the oldest citizens were at the highest risk of death of COVID–19. It may prove that the group of young people experienced different stressors, potentially overloading their emotional regulation capabilities (e.g., tendency to collect information from social media) [8]. Unfortunately, the GFQ tool used in the study is not normalized, so it is not possible to precisely relate the results to data from the general population. However, an estimated comparison of the average general results for the study groups with the results of mentally healthy Poles ($M = 1.73$) [19] suggests that adult Poles experienced increased mental suffering during the pandemic outbreak in April 2020. The present findings are in line with the outcomes of other studies from many countries [1–3, 8–13], including the Polish studies [14–17].

It was also examined how adult Poles experienced the COVID-19 pandemic in terms of emotional state. The youngest group (aged 18–25 years) compared to the older three groups of participants obtained significantly higher mean scores in the variable of threat to life. Their outcomes indicate that the youngest adults reacted to the pandemic situation with the stronger emotions. In all the age groups, the intensity order of a general threat to life dimensions was similar; the strongest was a threat to life of significant others, then less intense was a threat to world stability, and the least intense was a threat to one's own life. Even the oldest Poles declared the same order of experienced dimensions of threat to life. Thus, in the face of the COVID–19 pandemic, adult Poles focused mainly on the threat to life of their loved ones.

Anxiety as a crucial, emotional reaction in the first phase of the pandemic was quite severe in the whole research group. In order to detect clinically significant symptoms in the STAI–S, a cut-off point of 39–40 or 54–55 has been suggested [23]. Taking into consideration the lower cut-off point (>40), it was found that the majority of participants experienced the severity of state anxiety that bordered on clinical symptoms. Even at the higher level of cut-off point (>54) still a relatively large percentage of the participants (21.4%) suffered from severe anxiety as a probable reaction to the COVID–19 epidemic outbreak. These results are in line with the reports from China [8, 12] and European countries [11] that indicate an increase in anxiety symptoms in the first weeks of the coronavirus pandemic. Also they complement the reports from the Polish population study on increased generalized anxiety [15–18] with data on increased state anxiety.

The main purpose of this study was to test the hypothetical mediation model with two predictors of psychological distress: a general threat to life and state anxiety. As anticipated, the hypotheses derived from the model found support in that state anxiety mediated significantly the relationship between threat to life and psychological distress. It means that threat to live relevantly predicted an increase in state anxiety, which in turn made a significant impact on psychological distress amongst Polish adults aged 18–65 during the COVID–19 outbreak in April 2020. The present study provides some initial

insights into the crucial problem of the psychological mechanism behind the influence of the coronavirus pandemic. The COVID-19 mental consequences are, in particular: depressive symptoms, cognitive impairments, sleep problems, and somatic symptoms that could be predicted on the basis of a general threat to life (especially threat to life of significant others and threat to world stability) and even more precisely when the other variable (i.e., state anxiety) is taken into consideration. Therefore, the current findings indicate those areas of psychological functioning that should be strengthened. The concept of existential maturity as a source of resilience and protection against disorganizing anxiety may prove helpful in this case [4].

The present study manifests some limitations. First of all the cross-sectional design imposes limitations on the possibility to formulate a causal interpretation of the findings. Thus, the results of the mediation analysis must be treated with some caution. Second, despite a relatively large sample size, the limitations of the cross-sectional online study, including selection bias in recruiting participants, were not overcome. This tendency is manifested by a greater number of women in the study, of persons with higher education, coming from major Polish cities. These limitations undoubtedly reduce the representativeness of findings. Despite these limitations, the present study demonstrates some strengths. One of them is the large group of respondents who completed several time-consuming questionnaires covering many areas of their current (non-retrospective) pandemic experience. The use of the GFQ method provided a possibility of a multidimensional analysis of disturbances in psychological functioning in adult Poles. An innovative contribution of the present research appears to be two-fold: to highlight a sense of threat to life as an important predictor in the assessment of psychological distress, and to construct a reliable method for its assessment in the overall score and in subscales.

Conclusions

1. The conclusions from the study point to younger people as a risk group for psychological difficulties during the pandemic outbreak in Poland in the April of 2020.
2. Important variables in predicting the level of psychological difficulties were: state anxiety and threat to life with the main dimensions such as threat to life of significant others and threat to the world stability.
3. Threat to life positively correlated with state anxiety, which in turn had a positive correlation with psychological distress. Psychological distress as COVID-19 consequences, and especially depressive symptoms, cognitive impairments, sleep problems, and somatic symptoms, could be significantly predicted by the two kinds of emotional state such as threat to life and anxiety.

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