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How does stress affect life satisfaction during the COVID-19 pandemic? Moderated mediation analysis of sense coherence and fear of coronavirus

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How does stress affect life satisfaction during the COVID-19 pandemic? Moderated mediation analysis of sense of coherence and fear of coronavirus

The aim of the present study was to determine the relationship between fear of COVID-19, stress, sense of coherence, and life satisfaction during the coronavirus pandemic. Participants were 907 Polish people (522 women and 385 men). We used the Perceived Stress Scale (PSS-10), Fear of COVID-19 Scale (FOC-6), Sense of Coherence Scale (SOC-29) and the Satisfaction with Life Scale. The relationship between stress and life satisfaction was mediated by the sense of coherence, and the relationship between stress and sense of coherence was moderated by fear of COVID-19. The fear of COVID-19 acted as a buffer in the relationship between stress and sense of coherence weakening the impact of stress on the sense of coherence. This study is the first to verify the proposed model of moderated mediation during the COVID-19 pandemic and was undertaken in a very large sample. This manuscript highlights the important role of the fear of COVID-19 and sense of coherence in our well-being. An individual's sense of coherence can affect their subjective well-being and help them to effectively manage stress and reduce anxiety.

Keywords: COVID-19; fear of coronavirus; stress, sense of coherence; life satisfaction

Introduction

The COVID-19 outbreak has caused widespread stress. Increasing numbers of confirmed cases and deaths, strict isolation measures and closures of schools and workplaces have been associated with significant levels of stress (Chen et al., 2020). A fear of COVID-19 is related to perceived stress (Dymecka, Gerymski, Machnik-Czerwik, 2021) and negatively affects mental health (Fardin, 2020; Su et al., 2007).

Infectious diseases trigger a wide range of emotional responses, but not everyone experiences the same fear or stress (Khalid et al., 2016). Individual characteristics enable a person to adapt efficiently to difficult circumstances (Bonanno, Rennie, Dekel, 2005). One of these characteristics is a sense of coherence, defined as the degree of meaningfulness, comprehensibility, and manageability that people feel in their life (Antonovsky, 1987). Sense of coherence seems to be an important resource for dealing with pandemic stress. It is particularly necessary when strong stressors affect the individual (Dymecka, 2018). A strong sense of coherence is negatively associated with fear and perceived stress (Eriksson, Lindström, 2006).

Sense of coherence is also a health resource that affects the quality of life (Eriksson, Lindström, 2006; Floyd et al., 2011). It plays a mediating role in the relationships between various variables (Braun-Lewensohn, Sagy, Roth, 2011; Tang et al., 2013; Wiesmann, Dezutter, Hannich, 2014; Krok, 2016), including those between adverse experiences and psychological well-being (Gana, 2001), and between stress (and coping with it) and life satisfaction (Rohani et al., 2015). People with a strong sense of coherence can adapt to stress despite adversity and maintain good health and quality of life (Mc Gee et al., 2018). Therefore, it can be assumed that sense of coherence will be a mediator of the relationship between perceived stress, which may be exacerbated by a fear of COVID, and life satisfaction during a global pandemic (see Figure 1).

[INSERT FIGURE 1 ABOUT HERE]

Materials and methods

Participants

Study participants were 907 Polish people (522 women and 385 men). The average age of respondents was 39.28 years. Most of the respondents had secondary (38%) or higher (51%) education, lived in towns (45%) and were professionally active (70%). The study participants were part of the general population. Participant characteristics are detailed in Table 1.

[INSERT TABLE 1 ABOUT HERE]

Procedure

Recruitment of the study participants was carried out between March and May 2020 via the Internet using the snowball method. The participants were informed their responses would be anonymous. All respondents gave their informed consent to participate in this study, which was carried out in accordance with the guidelines of the University of Opole Bioethics Committee.

Measures

Perceived stress was measured using the Perceived Stress Scale (PSS-10; Cohen, Kamarck, Mermelstein, 1983) adapted by Juczyński and Ogińska-Bulik (2009), which consists of 10 questions on a five-point scale. The scale shows good reliability (Cronbach's $\alpha = .78 - .86$; in the present study Cronbach's $\alpha = .86$).

Fear of coronavirus was measured using the Fear of COVID-19 Scale (FOC-6; Dymecka, Gerymski, Machnik-Czerwik, 2021), a six-item questionnaire with responses on a five-point scale. The scale shows good reliability in its psychometric properties (in the present study Cronbach's $\alpha = .83$).

We also used the Sense of Coherence Scale (SOC-29; Antonovsky, 1993) adapted by Koniarek et al. (1993), which consists of 29 questions on a seven-point scale. Only the global

score was used in this study. The scale shows good reliability (Cronbach's $\alpha = .74 - .91$; in present study Cronbach's $\alpha = .91$).

The Satisfaction with Life Scale (Diener et al., 1985) adapted by Czapinski (2004) consists of five questions on a seven-point scale. The scale shows good reliability in its psychometric properties (Cronbach's $\alpha = .87$; in the present study Cronbach's $\alpha = .87$).

Statistical analysis

The significance of the relationships was tested with Pearson's r . Moderated mediation analysis was performed using PROCESS v3.4 (Hayes, 2017). Power analysis was conducted using G*Power 3.1.9.7 (Faul et al., 2020). A significance level of $\alpha = .05$ was adopted as the threshold value for statistical significance.

Results

Correlation analysis

Stress was positively correlated with fear of COVID-19. Stress and fear of COVID-19 were negatively associated with sense of coherence and life satisfaction. Sense of coherence was positively correlated with life satisfaction (Table 2).

[INSERT TABLE 2 ABOUT HERE]

Moderated mediation analysis

The bootstrap analysis (5000 samples; Preacher, Hayes, 2008) was used in PROCESS 3.4 Model 7 (Hayes, 2017). The results of the analysis are presented in Figure 2.

[INSERT FIGURE 2 ABOUT HERE]

The index of moderated mediation indicated that fear of COVID-19 moderated the indirect effect of the sense of coherence in the relationship between stress and life satisfaction. The results suggest that COVID-19 buffered the relationship between stress and sense of coherence, weakening the impact of stress on the sense of coherence (see Figure 3). The indirect effect of sense of coherence in the relationship between stress and life satisfaction was significant at all three levels of the moderator (see Table 3).

[INSERT TABLE 3 ABOUT HERE]

[INSERT FIGURE 3 ABOUT HERE]

Power analysis

For a small effect size ($f^2 = .02$) and a significance of $\alpha = .05$, the obtained sample was sufficient for a power of .96.

Discussion

The present results show that in a situation of high stress (as during the pandemic), sense of coherence is higher in people with a strong fear of COVID-19. Previous studies have shown that severe isolation measures are associated with significant levels of stress in the general population (Chen et al., 2020; Lee et al., 2020; Polizzi, Lynn, Perry, 2020). It is likely that people with a weak fear of COVID-19 felt only the negative consequences of isolation and lack of freedom, whereas those with a strong fear of COVID-19 felt that isolation was reasonable. A feeling that restrictions are sensible can raise the level of meaningfulness, which increases the sense of coherence. Sullivan (1989) argued that a sense of coherence depends more on faith in the legitimacy and logic of a given event than on satisfying the needs of the individual. People with a strong fear of COVID-19 might also have a strong sense of coherence because following isolation rules brings clarity and order into their lives.

Several studies have shown that negative life events can reduce sense of coherence (Karlsson, Berglin, Larsson, 2000), particularly situations of uncertainty and risk of disease

compared to explicit situations (Basińska, 2001), which includes pandemics. There is a view that people whose sense of coherence is already low or moderate are especially liable to its reduction under the influence of negative life events. In contrast, people with a strong sense of coherence are more resistant to negative changes (Hochwalder, Forsell, 2011) and negative life events do not reduce sense of coherence (Hochwalder, Forsell, 2011).

Sense of coherence in the present study was also a mediator of the relationship between stress and life satisfaction. This is in line with other studies showing that a sense of coherence was a mediator between chronic stress and life satisfaction (Mc Gee et al., 2018). A sense of coherence can be a source of resilience. Many studies have confirmed the relationship between sense of coherence and well-being (Bruscia et al., 2008). Sense of coherence makes us perceive a disease as less threatening (Gerasimčik-Pulko et al., 2009) and less stressful (Gustavsson-Lilius et al., 2007), and it can act as a protective factor against the harmful effects of perceived stress (Koushede et al., 2012; Koushede et al., 2011). A strong sense of coherence is particularly important when an individual experiences very difficult situations (Dymecka, 2018). Longitudinal studies indicate that sense of coherence can have a positive impact on the response to upcoming challenges over time, and improve quality of life (Rohani et al., 2015). The mediation path of the sense of coherence in the context of the present study seems to be the key to understanding how a stronger sense of coherence as an internal resource can serve as a protective factor in psychological adaptation to difficult life events.

Limitations

The tested moderated mediation model suggests causal relationships, but the moderated mediation analysis is only a complementary tool that does not allow cause and effect relationships to be determined. A longitudinal study should be carried out to verify the suggested relationships. In addition, our results are based on the Polish population. International research should be carried out to confirm the proposed model.

Summary

This study is the first to verify the proposed model of moderated mediation during the COVID-19 pandemic. Analyses were conducted in a very large sample and highlight the important roles of the fear of COVID-19 and the sense of coherence in our well-being.

Acknowledgments

None.

Declaration of interest

Here are no relevant financial or non-financial competing interest to report.

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Table 1.

Characteristics of the studied sample (N=907)

	<i>M</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>
Age (all participants)	39.28	15.30	18.00	102.00
Age (women)	38.59	15.22	18.00	101.00
Age (men)	40.21	15.38	18.00	102.00
	<i>n</i>		%	
Gender				
Women	522		57.55 %	
Men	385		42.45 %	
Education				
Elementary School	28		3.09 %	
Vocational	65		7.17 %	
High School	347		38.26 %	
University	467		51.49 %	
Place of Residence				
Village	220		24.26 %	
Town	410		45.20 %	
City	277		30.54 %	
Professional Activity				
Unemployed	268		29.55 %	
Employed	639		70.45 %	

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Table 2.

Results of the Pearson's r correlation analysis (N=907)

	<i>M</i>	<i>SD</i>	1.	2.	3.	4.
1. Stress	20.57	5.87	-			
2. Fear of COVID-19	21.41	5.84	.34***	-		
3. Sense of Coherence	131.11	24.15	-.53***	-.14***	-	
4. Life Satisfaction	22.67	5.99	-.40***	-.10**	.61***	-

Note: ** $p < .01$; *** $p < .001$

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Table 3.

Detailed data of the results of the PROCESS Model 7 analysis (N=907)

Mediation							
Path			Symbol	β	SE	LLCI	ULCI
<i>X</i>	->	<i>M</i>	a	-.51	.03	-.573	-.453
<i>M</i>	->	<i>Y</i>	b	.53	.03	-.192	-.071
<i>X(M)</i>	->	<i>Y</i>	c'	-.13	.03	.465	.586
Indirect Effects							
		Low <i>W</i>	a ₁ *b	-.32	.03	-.381	-.262
		Moderate <i>W</i>	a ₂ *b	-.27	.02	-.319	-.226
		High <i>W</i>	a ₃ *b	-.22	.03	-.275	-.173
Moderation							
Path			Symbol	β	SE	LLCI	ULCI
<i>X</i>	->	<i>M</i>	a ₁	-.51	.03	-.573	-.453
<i>W</i>	->	<i>M</i>	a ₂	.06	.03	-.003	.116
<i>X * W</i>	->	<i>M</i>	a ₃	.10	.02	.039	.146
		IMM	-	.05	.01	.021	.077

Note: β – standardized coefficient; *X* – Stress; *W*– Fear of COVID-19; *M* – Sense of Coherence; *Y* – Life Satisfaction; IMM – Index of Moderated Mediation

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Figure 1. A proposed moderated mediation model.

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Figure 2. Results of the PROCESS Model 7 analysis

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Figure 3. Interaction of stress and fear of COVID-19 as predictors of the sense of coherence