

# Emotion regulation difficulties and interpersonal problems during the COVID-19 pandemic: predicting anxiety and depression


## Correspondence

**Cite this article:** Solbakken OA, Ebrahimi OV, Hoffart A, Monsen JT, Johnson SU (2023). Emotion regulation difficulties and interpersonal problems during the COVID-19 pandemic: predicting anxiety and depression. *Psychological Medicine* **53**, 2181–2185. <https://doi.org/10.1017/S0033291721001987>

Received: 14 April 2021  
Revised: 22 April 2021  
Accepted: 28 April 2021  
First published online: 6 May 2021

### Author for correspondence:

Ole André Solbakken,  
E-mail: [o.a.solbakken@psykologi.uio.no](mailto:o.a.solbakken@psykologi.uio.no)

Ole André Solbakken<sup>1</sup> , Omid V. Ebrahimi<sup>1,2</sup>, Asle Hoffart<sup>1,2</sup>, Jon T. Monsen<sup>1</sup> and Sverre Urnes Johnson<sup>1,2</sup>

<sup>1</sup>Department of Psychology, University of Oslo, Oslo, Norway and <sup>2</sup>Research Institute, Modum Bad Psychiatric Hospital, Oslo, Norway

The COVID-19 pandemic and social distancing protocols aimed to slow its transmission are having severe mental health consequences (Brooks et al., 2020; Ebrahimi, Hoffart, & Johnson, 2021; Hoffart, Johnson, & Ebrahimi, 2020; Holmes et al., 2020; Prati & Mancini, 2021; Salari et al., 2020; Xiong et al., 2020). Depending on peoples' typical ways of reacting to stressful circumstances, the pandemic will probably produce different mental health consequences. Among factors likely central to the exacerbation and persistence of psychological symptoms, personality-based processes such as difficulties in the experience and regulation of emotion (Solbakken, Hansen, & Monsen, 2011) and severity of interpersonal problems (Horowitz, Alden, Wiggins, & Pincus, 2000) are particularly salient candidates. Both factors are likely to be impacted by the pandemic and amelioration measures of societal lock-down and social distancing. As amelioration measures in turn are relaxed, this impact may presumably diminish, gradually returning these factors to pre-crisis levels. Difficulties in emotion regulation and interpersonal problems are, in turn, likely to predict symptoms of depression and anxiety throughout the pandemic and beyond, and early levels of these factors will presumably predict later developments in symptom status. Similarly, reductions in emotion regulation- and interpersonal difficulties during various phases of the outbreak will presumably coincide with reductions in psychological symptoms. Thus, emotion regulation difficulties and interpersonal problems are likely to be systematically predictive of the course of mental health problems during the pandemic.

In order to investigate this issue, we conducted an internet-based survey with 10 061 responders at time 1 (*T1* – a period of strict social distancing protocols) and 4936 (49.1%) at time 2 (*T2* – a period when the majority of distancing protocols were discontinued). We specifically investigated the following hypotheses:

Hypothesis 1 (H1): We postulate a significant decrease in emotion-regulation difficulties and interpersonal problems from *T1* to *T2*.

Hypothesis 2 (H2): We postulate that the *T1*-level and changes from *T1* to *T2* in emotion-regulation difficulties and interpersonal problems will predict changes from *T1* to *T2* in anxiety and depression during the pandemic above and beyond other relevant factors such as age, gender, and education.

In terms of methodology, the study was a longitudinal, internet-based observational survey of the general adult Norwegian population during the COVID-19 pandemic with 10 061 responders at the height of lock-down (*T1*). After social distancing measures had been eased (*T2*), 4936 responders completed the survey again. Emotion regulation difficulties were assessed by a subset of items from the Difficulties in Emotion Regulation Scale (DERS). Interpersonal problems were assessed by a subset of items from the Inventory of Interpersonal Problems-64 (IIP). Symptoms of depression were assessed by The Patient Health Questionnaire-9 (PHQ-9). Symptoms of anxiety were assessed by The Generalized Anxiety Disorder-7 (GAD-7). Statistical analyses were performed by hierarchical linear mixed models (see online Supplementary materials for details).

See Table 1 for sample characteristics at *T1/T2*. Descriptive statistics for predictor and outcome variables at *T1/T2* are displayed in Table 2. Models testing H1 showed significant time effects for emotion regulation difficulties, interpersonal problems, anxiety, and depression (see Table 3). Figure 1 displays the effect sizes of changes.

Models testing H2 are shown in Tables 4 and 5. Addition of demographic variables and their interactions with time (model 1) showed that males, older persons, and the highly educated had lower depression at *T1*, males and older persons reported smaller reductions to *T2*. Similarly, males, older persons, and the highly educated had lower anxiety at *T1*, and males reported smaller reductions to *T2*.

**Table 1.** Demographic and social variables for the original sample at T1 and for the completer sample at T2

Characteristics	T1		T2	
	No.	%	No.	%
All participants	10 061	100	4936	100
Gender				
Female	7851	78	3911	79
Male	2184	22	1010	21
Transgender	22	0	13	0
Intersex	4	0	2	0
Age groups (years)				
18–30	4706	47	1711	35
31–44	2849	28	1610	33
45–64	2142	21	1347	27
65+	364	4	268	5
Educational level				
High school or lower	4417	44	2712	35
University degree	5644	56	3224	65
Partnership status				
Unmarried and not in a civil union	5310	53	2337	47
Married or in a civil union	4751	47	2599	53
Employment status				
Currently unemployed	1928	19	1156	23
Currently employed	8140	81	3780	77
Refugee status				
Refugee	574	6	302	6
Not refugee	9487	94	4634	94
Children				
Having children	4253	42	2420	49
Not having children	5808	58	2516	51
Psychological diagnosis				
Having a diagnosis	1721	17	890	18
Not having a diagnosis	8340	83	4046	82
Living status				
Living alone	–	–	1134	23
Living with others	–	–	4046	77
Home confinement				
Mostly stayed home	7952	79	3892	79
Not mostly stayed home	2109	21	1044	21
Employment and COVID-19				
Lost job due to COVID-19	1367	17	203	4
Not lost job due to COVID-19	8694	83	4733	96

Note. T1 = a period of 1 week (31st March to 7th April 2020) starting nearly 3 weeks after the implementation of strict social distancing protocols in Norway (12th March 2020). T2 = a period of 3 weeks (22nd June to 13th July 2020) starting 1 week after the strict social distancing protocols had been discontinued (15th June 2020).

**Table 2.** Descriptive statistics for the predictor and outcome variables across time

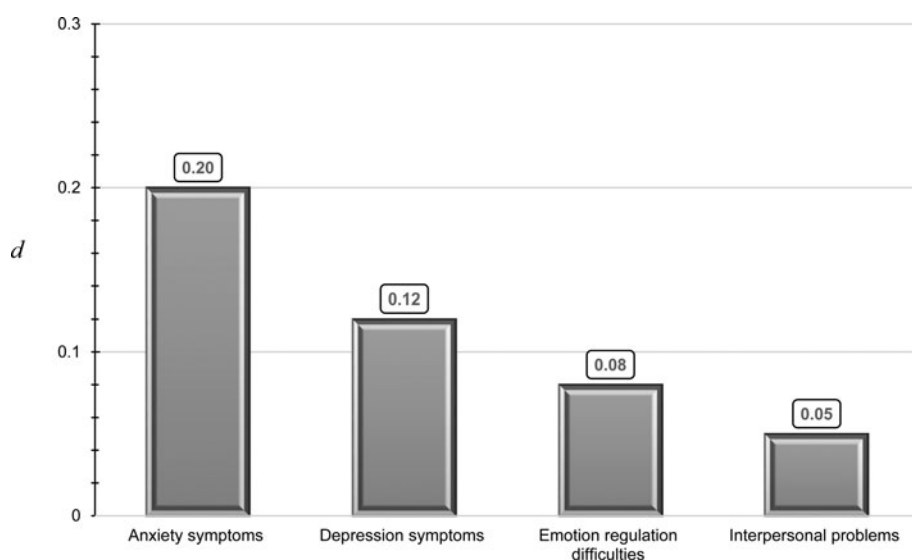
Variable (range)	T1		T2		<i>r</i>	$\alpha$
	<i>M</i>	s.d.	<i>M</i>	s.d.		
Emotion regulation difficulties (6–30)	12.64	4.30	12.22	4.27	0.73	0.75
Interpersonal problems (0–60)	22.92	9.21	22.53	9.65	0.80	0.82
Depression symptoms (0–27)	7.32	5.69	6.63	5.66	0.74	0.91
Anxiety symptoms (0–21)	5.55	4.62	4.66	4.37	0.69	0.90

Note. T1 = a period of 1 week (31st March to 7th April 2020) starting nearly 3 weeks after the implementation of strict social distancing protocols in Norway (12th March 2020). T2 = a period of 3 weeks (22nd June to 13th July 2020) starting 1 week after the strict social distancing protocols had been discontinued (15th June 2020). *r* = Pearson's *r*; *d* = Cohen's *d*;  $\alpha$  = Cronbach's  $\alpha$ .

**Table 3.** Fixed effects estimates (top) and variance-covariance estimates (bottom) for multilevel models of difficulties in emotion regulation, interpersonal problems, depressive symptoms, and anxiety symptoms from T1 to T2

	DERS Estimate	IIP Estimate	PHQ-9 Estimate	GAD-7 Estimate
Fixed effects				
Intercept	12.64* (0.04)	22.92* (0.09)	7.61* (0.06)	5.73* (0.05)
Time	−0.27* (0.04)	−0.44* (0.08)	−0.77* (0.06)	−0.95* (0.05)
	Estimate	Estimate	Estimate	Estimate
Random effects				
Variance intercept	13.36* (0.25)	69.59* (1.22)	23.83* (0.44)	13.85* (0.29)
Residual Tot/T1	5.03* (0.10)	15.18* (0.76)	8.51* (0.17)	7.52* (0.23)
Residual T2	–	20.40* (0.83)	–	5.23* (0.22)
AIC	82 542.82	104 477.2	90 835.14	84 793.99

DERS, difficulties in emotion regulation; IIP, overall interpersonal problems; PHQ-9, symptoms of depression; GAD-7, symptoms of anxiety; AIC, Akaike's information criterion. Note. Standard errors are given in parenthesis. Estimations were performed by the method of maximum likelihood (ML). \**p* < 0.01. Tot = total residual in models with homoscedastic error covariance structures. T1 = a period of 1 week (31st March to 7th April 2020) starting nearly 3 weeks after the implementation of strict social distancing protocols in Norway (12th March 2020). T2 = a period of 3 weeks (22nd June to 13th July 2020) starting 1 week after the strict social distancing protocols had been discontinued (15th June 2020).



**Fig. 1.** Effect sizes of changes from T1 to T2 in anxiety symptoms, depression symptoms, emotion regulation difficulties, and interpersonal problems. Note. T1 = a period of 1 week (31st March to 7th April 2020) starting nearly 3 weeks after the implementation of strict social distancing protocols in Norway (12th March 2020). T2 = a period of 3 weeks (22nd June to 13th July 2020) starting 1 week after the strict social distancing protocols had been discontinued (15th June 2020). *d* = Cohen's *d*.

The addition of initial emotion regulation difficulties, interpersonal problems, and interactions with time (model 2), showed that greater problem load in both domains was associated with more extensive anxiety and depression at T1. More extensive emotion

regulation difficulties at T1 predicted greater reductions in both symptom domains, more extensive interpersonal problems did not.

Addition of three-way interactions between emotion regulation difficulties, interpersonal problems, and time (model 3), indicated

**Table 4.** Fixed effects estimates (top) and variance-covariance estimates (bottom) for predictive multilevel models of depressive symptoms (PHQ-9) from T1 to T2

	Model 1	Model 2	Model 3	Model 4	
	Est.	Est.	Est.	Est.	t (df)
Fixed effects					
Intercept	7.95* (0.06)	7.84* (0.05)	7.83* (0.05)	7.89* (0.05)	168.46 (12 488.75)
Time	-0.88* (0.06)	-0.90* (0.06)	-0.99* (0.07)	-0.78* (0.06)	-12.01 (6501.68)
Age	-0.11* (0.01)	-0.04* (0.01)	-0.04* (0.01)	-0.03* (0.01)	-9.79 (12 488.75)
Gender	-1.57* (0.13)	-1.07* (0.11)	-1.07* (0.11)	-1.20* (0.10)	-11.74 (12 488.75)
Education	-0.60* (0.05)	-0.45* (0.05)	-0.45* (0.05)	-0.44* (0.05)	-9.54 (12 488.75)
Time × Age	0.02* (0.01)	0.01* (0.01)	0.01* (0.01)	0.02* (0.01)	5.24 (6140.00)
Time × Gender	0.72* (0.14)	0.61* (0.13)	0.60* (0.14)	0.65* (0.13)	4.91 (6273.98)
Time × Education	0.04 (0.08)	0.06 (0.06)	0.05 (0.06)	0.08 (0.06)	1.36 (6317.98)
DERS T1		0.68* (0.01)	0.68* (0.01)	0.52* (0.02)	26.14 (12 488.75)
IIP T1		0.10* (0.01)	0.11* (0.01)	0.10* (0.01)	9.67 (12 488.75)
Time × DERS T1		-0.13* (0.02)	-0.15* (0.02)	-0.37* (0.02)	-19.00 (5267.96)
Time × IIP T1		0.03* (0.01)	0.03* (0.01)	-0.10* (0.01)	-9.84 (5148.50)
Time × DERS T1 × IIP T1			0.01* (0.01)	0.01 (0.01)	1.25 (8210.69)
DERS T2				0.19* (0.02)	9.54 (12 488.75)
IIP T2				-0.01 (0.01)	-0.57 (12 488.75)
Time × DERS T2				0.42* (0.02)	20.96 (5267.58)
Time × IIP T2				0.11* (0.01)	10.82 (5102.91)
	Est.	Est.	Est.	Est.	Wald Z
Variance intercept	20.54* (0.39)	9.99* (0.25)	9.97* (0.25)	9.62* (0.24)	40.80
Residual	8.40* (0.17)	8.27* (0.16)	8.27* (0.16)	7.34* (0.15)	49.75
AIC	89 344.50	84 158.27	84 149.58	82 914.32	-

DERS, difficulties in emotion regulation; IIP, overall interpersonal problems; AIC, Akaike's information criterion.

Note. Standard errors and degrees of freedom are given in parenthesis. Estimations were performed by the method of maximum likelihood (ML) and with a homoscedastic error covariance structure. \* $p < 0.01$ . T1 = a period of 1 week (31st March to 7th April 2020) starting nearly 3 weeks after the implementation of strict social distancing protocols in Norway (12th March 2020). T2 = a period of three weeks (22nd June to 13th July 2020) starting 1 week after the strict social distancing protocols had been discontinued (15th June 2020). Degrees of freedom (df),  $t$  values, and Wald Z are given only for the final model.

that the effect of initial emotion regulation difficulties on symptom reduction was dependent on the level of interpersonal problems: more pervasive interpersonal problems reversed the effect of emotion regulation difficulties on symptom development.

The final step, adding T2 levels of the predictors (model 4) and their respective interactions with time, demonstrated that reductions in the predictor variables across time were strongly associated with reductions in symptoms.

Problem load in all of the examined domains was significantly reduced, but with minor effect sizes. Thus, vaccination, mass immunity, and subsequent return to normal daily life may not in and of themselves lead to the desired rapid improvement of mental health in the population. As expected, greater problem load in both predictor domains was associated with more anxiety- and depressive symptoms across time. Improvements in predictor domains were associated with symptom reduction. Thus, focused interventions that target these processes may help remediate the mental health strain of COVID-19.

Contrary to hypothesis, more extensive emotion regulation difficulties initially predicted greater symptom reduction, whereas the opposite was true for interpersonal problems. Thus, participants with more extensive emotion regulation

difficulties became more similar to average responders in symptoms from T1 to T2, whereas those with more severe interpersonal problems became further removed from the average. We may speculate that those having greater difficulties tolerating unpleasant emotions were more negatively affected by the onset of the pandemic, and also experienced more relief when emotional pressures associated with COVID-19 somewhat dissipated with easing of social distancing protocols. Similarly, the negative effect of interpersonal problems on symptom improvement is meaningful, as entrenched, maladaptive interpersonal strategies presumably hinder constructive use of social contacts in the service of improving one's situation as social distancing was eased. These propositions are also consistent with the interaction between emotion regulation difficulties and interpersonal problems. In this case, additional relief afforded by reduced emotional pressure through eased amelioration measures for responders with low tolerance for emotions was offset by the presence of persistent maladaptive relational strategies. Our results suggest that poor tolerance of emotions and maladaptive relational strategies are targets of intervention worth pursuing for alleviating anxiety and depression during the pandemic.

**Table 5.** Fixed effects estimates (top) and variance-covariance estimates (bottom) for predictive multilevel models of anxiety symptoms (GAD-7) from T1 to T2

	Model 1	Model 2	Model 3	Model 4	
	Est.	Est.	Est.	Est.	t (df)
<b>Fixed effects</b>					
Intercept	6.08* (0.05)	5.97* (0.04)	5.97* (0.04)	5.99* (0.04)	148.33 (10 035.00)
Time	-1.01* (0.05)	-1.03* (0.05)	-1.10* (0.06)	-0.94* (0.05)	-17.43 (5972.01)
Age	-0.06* (0.01)	-0.01* (0.01)	-0.01* (0.01)	-0.01* (0.01)	-4.90 (10 035.00)
Gender	-1.67* (0.11)	-1.15* (0.09)	-1.15* (0.09)	-1.15* (0.09)	-13.06 (10 035.00)
Education	-0.60* (0.05)	-0.17* (0.04)	-0.17* (0.04)	-0.16* (0.04)	-4.11 (10 035.00)
Time × Age	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)	0.01 (0.01)	0.70 (5969.33)
Time × Gender	0.78* (0.12)	0.66* (0.12)	0.66* (0.12)	0.67* (0.11)	6.08 (5982.96)
Time × Education	0.05 (0.05)	0.01 (0.05)	0.01 (0.05)	0.04 (0.05)	0.71 (5984.17)
DERS T1		0.58* (0.01)	0.58* (0.01)	0.46* (0.02)	26.62 (10 035.00)
IIP T1		0.05* (0.01)	0.05* (0.01)	0.05* (0.01)	5.14 (10 035.00)
Time × DERS T1		-0.14* (0.01)	-0.15* (0.01)	-0.34* (0.02)	-19.86 (5509.21)
Time × IIP T1		0.03* (0.01)	0.03* (0.01)	-0.07* (0.01)	-7.48 (5399.94)
Time × DERS T1 × IIP T1			0.01* (0.01)	0.01 (0.01)	1.34 (4921.00)
DERS T2				0.16* (0.02)	8.96 (10 035.00)
IIP T2				-0.01 (0.01)	-0.65 (10 035.00)
Time × DERS T2				0.34* (0.02)	19.87 (5508.79)
Time × IIP T2				0.07* (0.01)	8.55 (5355.75)
	Est.	Est.	Est.	Est.	Wald Z
Variance intercept	12.36* (0.27)	6.50* (0.18)	6.49* (0.18)	5.87* (0.16)	36.39
Residual T1	7.28* (0.23)	6.24* (0.18)	6.25* (0.18)	6.76* (0.17)	40.16
Residual T2	5.35* (0.22)	6.14* (0.19)	6.12* (0.19)	4.33* (0.16)	27.48
AIC	83 621.91	78 987.70	78 979.62	77 825.80	-

DERS, difficulties in emotion regulation; IIP, overall interpersonal problems; AIC, Akaike's information criterion.

Note. Standard errors and degrees of freedom are given in parenthesis. Estimations were performed by the method of maximum likelihood (ML) and a heteroskedastic error covariance structure. \* $p < 0.01$ . T1 = a period of 1 week (31st March to 7th April 2020) starting nearly 3 weeks after the implementation of strict social distancing protocols in Norway (12th March 2020). T2 = a period of 3 weeks (22nd June to 13th July 2020) starting 1 week after the strict social distancing protocols had been discontinued (15th June 2020). Degrees of freedom (df),  $t$  values, and Wald  $Z$  are given only for the final model.

**Supplementary material.** The supplementary material for this article can be found at <https://doi.org/10.1017/S0033291721001987>.

**Financial support.** The study was in its entirety funded internally by the University of Oslo, Norway.

**Conflict of interest.** The authors declare no conflict of interest.

## References

- Brooks, S. K., Webster, R. K., Smith, L. E., Woodland, L., Wessely, S., Greenberg, N., & Rubin, G. J. (2020). The psychological impact of quarantine and how to reduce it: Rapid review of the evidence. *The Lancet*, 395 (10227), 912–920. doi: 10.1016/S0140-6736(20)30460-8.
- Ebrahimi, O. V., Hoffart, A., & Johnson, S. U. (2021). Physical distancing and mental health during the COVID-19 pandemic: Factors associated with psychological symptoms and adherence to pandemic mitigation strategies. *Clinical Psychological Science*. <https://doi.org/10.1177/2167702621994545>
- Hoffart, A., Johnson, S. U., & Ebrahimi, O. (2020). Loneliness and social distancing during the COVID-19 pandemic: Risk factors and associations with psychopathology. *PsyArXiv*. doi:10.31234/osf.io/j9e4q.
- Holmes, E. A., O'Connor, R. C., Perry, V. H., Tracey, I., Wessely, S., Arseneault, L., ... Bullmore, E. (2020). Multidisciplinary research priorities for the COVID-19 pandemic: A call for action for mental health science. *The Lancet Psychiatry*, 7, 547–560. doi: 10.1016/S2215-0366(20)30168-1.
- Horowitz, L. M., Alden, L. E., Wiggins, J. S., & Pincus, A. L. (2000). *Inventory of interpersonal problems (IIP-32/IIP-64)*. London: Psychological Corporation.
- Prati, G., & Mancini, A. (2021). The psychological impact of COVID-19 pandemic lockdowns: A review and meta-analysis of longitudinal studies and natural experiments. *Psychological Medicine*, 51(2), 201–211. doi: 10.1017/S0033291721000015.
- Salari, N., Hosseini-Far, A., Jalali, R., Vaisi-Raygani, A., Rasoulpoor, S., Mohammadi, M., ... Khaledi-Paveh, B. (2020). Prevalence of stress, anxiety, depression among the general population during the COVID-19 pandemic: A systematic review and meta-analysis. *Globalization and Health*, 16(1), 57–57. doi: 10.1186/s12992-020-00589-w.
- Solbakken, O. A., Hansen, R. S., & Monsen, J. T. (2011). Affect integration and reflective function: Clarification of central conceptual issues. *Psychotherapy Research*, 21(4), 482–496. doi: 10.1080/10503307.2011.583696.
- Xiong, J., Lipsitz, O., Nasri, F., Lui, L. M., Gill, H., Phan, L., ... McIntyre, R. S. (2020). Impact of COVID-19 pandemic on mental health in the general population: A systematic review. *Journal of Affective Disorders*, 277, 55–64. doi: 10.1016/j.jad.2020.08.001.