Received: 15 May 2023 | Accepted: 21 August 2023

DOI: 10.1111/bjc.12438

the british psychological society
promoting excellence in psychology

BRIEF REPORT

Beliefs about emotions predict psychological stress related to somatic symptoms

Klaus Michael Reininger[1,2] | **Hannah Marie Biel**[1,2] | **Timo Hennig**[3] | **Steffen Zitzmann**[4] | **Angelika Weigel**[1] | **Carsten Spitzer**[5] | **Anne Toussaint**[1] | **Bernd Löwe**[1,2]

[1]Department of Psychosomatic Medicine and Psychotherapy, University Medical Center Hamburg-Eppendorf, Hamburg, Germany

[2]Institute of Psychotherapy, University Medical Center Hamburg-Eppendorf, Hamburg, Germany

[3]Faculty of Human Sciences, Department of Inclusive Education, University of Potsdam, Potsdam, Germany

[4]Hector Research Institute of Education Sciences and Psychology, Eberhard-Karls-University of Tübingen, Tübingen, Germany

[5]Department of Psychosomatic Medicine and Psychotherapy, University Medical Center Rostock, Rostock, Germany

Correspondence
Klaus Michael Reininger, Department of Psychosomatic Medicine and Psychotherapy, University Medical Center Hamburg-Eppendorf, Martinistr. 52, W37, R6011, D-20246 Hamburg, Germany.
Email: m.reininger@uke.uni-hamburg.de

Funding information
Verbund norddeutscher Universitäten

Abstract

Background: Previous research has shown that the more people believe their emotions are controllable and useful (BECU), the less they generally report psychological distress. Psychological distress, in turn, impacts health outcomes, and is among the most frequently reported complaints in psychotherapeutic and psychosomatic practice.

Objective: We aimed to examine how BECU predicts psychological distress related to somatic symptoms in a prospective sample from the general population and to replicate this association in two cross-sectional samples of psychosomatic patients.

Methods: We applied a panel design with an interval of 2 weeks between T1 and T2 in general-population panel-participants ($N = 310$), assessing BECU and psychological distress related to somatic symptoms via validated self-report measures. Moreover, we cross-sectionally replicated the relationship between BECU and psychological distress in a clinical sample of psychosomatic outpatients diagnosed with somatoform disorders ($n = 101$) or without somatoform disorders ($n = 628$).

Results: BECU predicted over and above the lagged criterion panel-participants' psychological distress related to somatic symptoms, $\beta = -.18$, $p < .001$. BECU was also cross-sectionally related to psychological distress in our *clinical replication-sample* of psychosomatic outpatients diagnosed with somatoform disorders, $r_S(87) = -.33$, $p = .002$ and in those without, $r_S(557) = -.21$, $p < .001$.

Conclusions: BECU as a malleable way of thinking about emotions predicted psychological distress related to somatic symptoms in general-population panel-participants and correlated with the same in two clinical replication samples. BECU thus becomes a promising treatment target in psychotherapeutic approaches.

KEYWORDS

affective mentalization, beliefs about emotions, controllability, emotions, psychological distress, somatic symptoms, somatic symptom disorder, usefulness

BACKGROUND

Previous research has shown that the more people believe their emotions are controllable and useful (BECU), the less they generally report psychological distress (Becerra et al., 2020; Biel et al., 2023; Ford & Gross, 2019). Psychological distress, in turn, has been given a prominent role in psychosomatic research, for example, in the form of psychological symptom burden (Fava et al., 2017; Kellner, 1994; Porcelli & Guidi, 2015; Van der Feltz-Cornelis & Van Dyck, 1997), especially in the DSM-5-TR diagnosis of Somatic Symptom Disorder (SSD; American Psychiatric Association, 2022; see also: Desai & Chaturvedi, 2016; Dimsdale & Levenson, 2013; Henningsen et al., 2018; Huang & Liao, 2018; Van den Eede & Van der Feltz-Cornelis, 2018). Although distress has been identified to be the most frequently reported syndrome in psychosomatic medicine and psychotherapy as well as to impact and attenuate psychosomatic symptoms (Guidi et al., 2021), BECU has not yet systematically been studied in the context of somatic symptoms and somatoform disorders (Okur Güney et al., 2019, p. 16).

The notion that experiencing, naming and expressing (i.e. holding beliefs about) one's emotions relate to somatic symptoms is not new to psychosomatic research: Starting with Freud's idea that there might be an "enigmatic leap from the psychic into the physical" (1916/1917, p. 265), many scholars have noted the negative relation between a person's ability to experience and express emotions as controllable and useful on the one hand, and somatic symptoms and psychological distress thereof on the other hand in aetiological models, cross-sectional or quasi-experimental research-designs (e.g. Henningsen, 2020; Henningsen et al., 2018; Löwe et al., 2022; Seitz et al., 2022; Subic-Wrana et al., 2010; for a systematic review of studies showing that beliefs about emotions relate to psychological distress in somatic symptoms: Okur Güney et al., 2019, p. 17). Successful intervention-studies explicitly focus on the link between emotions and bodily sensations (Abbass et al., 2020; Arbeitskreis PISO, 2012; Kleinstäuber et al., 2019; Sattel et al., 2012) and might therefore be effective. However, there is a need to clarify the mechanisms between emotions and bodily sensations, that is, why we elucidate the relationship between BECU and psychological distress related to somatic symptoms. Specifically, we translated one particular belief with regard to the experience of emotions into the context of somatic symptoms and somatoform disorders: believing that (both negative and positive) emotions are controllable and useful (BECU) should result in low psychological distress related to somatic symptoms.

Ford and Gross (2019) note that BECU is crucial for psychological well-being. On the one hand, if emotions are experienced as *controllable*, more expectancy-based effort should be invested in their regulation, or goals should be set that involve emotion regulation. On the other hand, if emotions are experienced as *useful*, an individual might not want them to be "simply reduced" but to take them seriously in their (interpersonal and intrapsychic) meaning (Biel et al., 2023). For these theoretical reasons, we hypothesized that BECU predicts improvement of psychological distress related to somatic symptoms over time in participants from the general population and that BECU relates to reduced psychological distress related to somatic symptoms cross-sectional in patients with somatoform disorders.

METHOD

In our study, we first examined the relationship between BECU and psychological distress related to somatic symptoms in a panel with a 2-week interval in participants from the general population. Second, we cross-sectionally replicated the relationship between BECU and psychological distress related to somatic symptoms in a clinical sample of psychosomatic outpatients diagnosed with a somatoform disorder as well as additionally in psychosomatic outpatients diagnosed with a mental disorder other than somatoform. Both study protocols were reviewed and approved by Local Psychological Ethics Committee at the Center for Psychosocial Medicine (LPEK) at University Medical Center Hamburg-Eppendorf, approval numbers LPEK-0310 and LPEK-0334. The clinical replication study of this study was preregistered: https://trialsearch.who.int/Trial2.aspx?TrialID=DRKS00026016. In the panel-sample, informed consent was obtained online; in the clinical replication-sample, written informed consent was obtained from patients.

Power analysis

We based our power analysis of the *panel-sample* on the assumption that BECU impacts psychological distress (as lagged criterion) with a small effect ($r = .2$), which would be in the "zone of desired effects" (Hattie, 2009, p. 97). We applied this effect size to an a-priori power analysis for correlations in g*Power (Faul et al., 2007). The power analysis indicated that approximately 314 participants would be needed to achieve 95% power ($\alpha = .05$). To account for potential panel-sample study-dropouts (approximately 40%), we recruited 462 adults at T1. In our *clinical replication sample*, we recruited all patients who were available during the survey period.

Participants

In the prospective *panel-sample*, we administered two attention checks, one at each time point. Participants who failed an attention check were not admitted into any sample. Research participants were recruited online using Amazon's Mechanical Turk via TurkPrime. At T1, 432 participants completed the online questionnaire and were re-contacted 2 weeks later for a follow-up; 310 (71.76%) completed the T2-questionnaire. Thus, our final prospective *panel-sample* included 310 general population US-citizens ($M_{age} = 43.11$ years, $SD = 13.79$; 51% male; 67% had a college or university degree, more sociodemographic characteristics in Table 1). Comparisons between participants who had participated only at Time 1 ($n = 122$) and the final panel sample revealed that the proportions of women and other were higher in the panel sample (non-respondent-group: 58% male, 40% female, 2% other, $ps \leq .006$).

The *clinical replication sample* consisted of German psychosomatic outpatients with a clinical diagnosis of a somatoform disorder ($n = 101$) or with a mental disorder other than somatoform ($n = 628$). Participants underwent standardized diagnostic clinical assessments. Inclusion criteria were: Age between 18 and 90 years and a definite (i.e. given by a physician) diagnosis of (a) somatoform disorder(s) with one or more somatic symptom(s) that are distressing or result in significant disruption of daily life (i.e. ICD-10-coding: F45.0, F45.1, F45.3, F45.4, F45.8, F45.9; *clinical replication sample of patients diagnosed with somatoform disorders*), respectively, a definite F-diagnosis apart from these according to ICD-10 (*clinical replication sample of patients diagnosed with a mental disorder other than somatoform*). For distribution of diagnoses in both clinical replication samples, see Table 2; Tables A1 and A2.

In the *clinical replication sample* of patients diagnosed with somatoform disorders, participants' mean age was 47.39 years ($SD = 15.65$) and 68% were female. In the clinical replication sample of patients diagnosed with a mental disorder other than somatoform, participants' mean age was 38.43 years ($SD = 14.82$) and 66% were female (see Table 2).

TABLE 1 Panel-sample: Descriptive statistics, internal consistencies and correlations of beliefs about emotions as controllable and useful (BECU) and psychological distress related to somatic symptoms (SSD-12) in a general population US citizens sample ($N = 310$).

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9
1. SSD t1	2.84	1.65	$\alpha = .97$								
2. BECU t1	5.14	1.27	−.67***	$\alpha = .95$							
3. SSD t2	2.78	1.58	.86***	−.67***	$\alpha = .96$						
4. BECU t2	5.16	1.33	−.60***	.91***	−.64***	$\alpha = .96$					
5. Education[a]	4.70	1.30	.00	−.07	−.02	−.09	–				
6. Age	43.11	13.79	.17**	.25***	.13*	.22***	.01	–			
7. Political orientation[b]	5.04	2.70	−.14*	−.26***	−.13*	−.27***	.06	.09	–		
8. Gender	Male	50.6%	−.03	−.07	−.05	−.07	−.02	.01	−.06	–	
	Female	49.4%									
9. Annual income	67,096.77	48,428.36	.14*	.09	.12*	.11	.28***	.04	.10	−.09	–
10. Minority[c]	1.71	.46	.24***	−.27***	.20**	.26***	.00	.19**	.00	−.05	.09

Note. All participants responded to the questionnaire at time 1 (*t*1) and at time 2 (*t*2) with an interval of 2 weeks in between. BECU (Beliefs about Emotions as Controllable and Useful) was assessed with the inversed Emotion Beliefs Questionnaire (Becerra et al., 2020), Psychological Stress Related to Somatic Symptoms was assessed with the SSD-12 = Somatic Symptom Disorder-B Criteria Scale (Toussaint et al., 2016).

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

[a]Highest level of Education with (1) High-School diploma (7.7%); (2) Some College (13.2%); (3) Associate Degree (11.9%); (4) Bachelor's Degree (40.0%); (5) Master's Degree (22.3%); (6) Professional Degree or Doctorate Degree (4.8%).

[b]Political orientation on a 1-10-Likert-scale ranging from 1(extremely liberal) to 10 (extremely conservative).

[c]Self-consideration as a minority with 1 (yes) and 2 (no).

TABLE 2 Clinical replication sample: Dcearman's correlations of beliefs about emotions as controllable and useful (BECU) and psychological distress related to somatic symptoms (SSD-12) in a German psychosomatic outpatient-sample with somatoform disorders ($N = 101$) and in a German psychosomatic outpatient sample diagnosed mental disorders apart from somatoform disorders ($N = 628$).

Variable	*n*	*M*	*SD*	1	2	3	4
Patients with somatoform disorders[a] (*N* = 101)							
1. SSD	97	2.59	.83	$\alpha = .91$			
2. BECU	90	2.91	.81	−.33** (*df* = 87)	$\alpha = .87$		
3. Gender	100	Male	32%	−.07 (*df* = 94)	.03 (*df* = 87)	–	
		Female	68%				
4. Age	101	47.39	15.65	.07 (*df* = 95)	−.04 (*df* = 88)	.12 (*df* = 98)	–
5. Education[b]	98	3.70	1.92	−.00 (*df* = 93)	.37*** (*df* = 85)	−.03 (*df* = 95)	−.15 (*df* = 96)
Patients with diagnosed mental disorders apart from somatoform disorders[c] (*N* = 628)							
1. SSD	583	2.10	.92	$\alpha = .93$			
2. BECU	583	2.93	.65	−.21*** (*df* = 557)	$\alpha = .86$		
3. Gender	624	Male	34.13%	−.04 (*df* = 577)	.04 (*df* = 577)	–	
		Female	65.87%				
4. Age	628	38.43	14.82	.09* (*df* = 581)	−.02 (*df* = 581)	−.11* (*df* = 622)	–
5. Education[b]	614	4.25	1.63	−.21*** (*df* = 572)	.18*** (*df* = 574)	−.02 (*df* = 608)	.02 (*df* = 612)

Note. As we included all participant data, sample sizes and degrees of freedom vary. BECU (Beliefs about Emotions as Controllable and Useful) was assessed with the inversed Emotion Beliefs Questionnaire (Becerra et al., 2020, German version: Biel et al., 2023), Psychological Stress Related to Somatic Symptoms was assessed with the SSD-12 = Somatic Symptom Disorder-B Criteria Scale (Toussaint et al., 2016). Since both samples are not normally distributed, we used Spearman's correlations (r_s).

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

[a]Diagnostic characteristics in the psychosomatic sample diagnosed with somatoform disorders ($n = 101$) according to the International Statistical Classification of Diseases and Related Health Problems 10th revision 5th edition (ICD-10; WHO, 2016): seven persons diagnosed with "Somatization disorder" (F45.0), two persons diagnosed with "Undifferentiated somatoform disorder" (F45.1), 15 persons diagnosed with "Somatoform autonomic dysfunction" (F45.3), 71 persons diagnosed with "Persistent somatoform pain disorder" (F45.4), five persons diagnosed with "Other somatoform disorder" (F45.8) and one person diagnosed with "Somatoform disorder, unspecified" (F45.9). Further diagnoses: "Mental and behavioural disorders due to psychoactive substance use" (F1; $n = 2$), "Mood [affective] disorders" (F3; $n = 71$), "Neurotic, stress-related and somatoform disorders" apart from somatoform disorders (F41, F43, F44; $n = 8$), "Behavioural syndromes associated with physiological disturbances and physical factors" (F5; $n = 14$), "Disorders of adult personality and behaviour" (F6; $n = 3$). Twenty-one persons were diagnosed with one diagnosis, 67 persons with two diagnoses, nine persons with three diagnoses and four persons with four diagnoses.

[b]Highest level of education with (1) still in school (1.3%); (2) elementary school (9.4%); (3) polytechnic high school (.5%); (4) secondary school (22.3%); (5) vocational diploma (12.3%); (6) high school (23.7%); (7) completed studies (28.3%).

[c]Diagnostic characteristics in the psychosomatic sample diagnosed apart from somatoform disorders ($n = 628$) according to the International Statistical Classification of Diseases and Related Health Problems 10th revision 5th edition (ICD-10; WHO, 2016): "Mental and behavioural disorders due to psychoactive substance use" (F1; $n = 32$), "Schizophrenia, schizotypal and delusional disorders" (F2; $n = 4$), "Mood [affective] disorders" (F3; $n = 448$), "Neurotic, stress-related and somatoform disorders" apart from somatoform disorders (F40, F41, F42, F43, F44, F45.2, F48; $n = 193$), "Behavioural syndromes associated with physiological disturbances and physical factors" (F5; $n = 274$), "Disorders of adult personality and behaviour" (F6; $n = 15$), "Disorders of psychological development" (F8; $n = 2$), "Behavioural and emotional disorders with onset usually occurring in childhood and adolescence" (F9; $n = 8$). In addition, 320 persons were diagnosed with one diagnosis, 276 persons with two diagnoses, 22 persons with three diagnoses and 10 persons with four diagnoses. For a more differentiated overview of the diagnoses see Appendix A (Tables A1 and A2).

Measures[1]

In all samples, we assessed BECU using the Emotion Beliefs Questionnaire[2] (EBQ [Becerra et al., 2020], in our *clinical replication* sample using the German Version [Biel et al., 2023]). BECU is a self-report instrument aiming to assess beliefs about positive and negative emotions as controllable and useful. This instrument captures three factors: experienced controllability of both positive and negative emotions (example item: "People cannot learn techniques to effectively control their positive emotions"), as well as the usefulness of negative emotions (example item: "Negative emotions are harmful") as well as the usefulness of positive emotions (example item: "There is very little use for positive emotions"). We also assessed psychological distress related to somatic symptoms using the Somatic Symptom Disorder-B Criteria Scale (SSD-12; Toussaint et al., 2016). This self-report scale aims to assess three psychological subcriteria using a total of 12 items based directly on the DSM-5 wording (four items for each subcriterion): perceptions of their symptom-related thoughts, feelings and behaviours using questions directly based on the DSM-5 criteria tapping on cognitive (example item: "I think that my physical symptoms are signs of a serious illness"), affective (example item: "I am very worried about my health") or behavioural aspects (example item: "My health concerns hinder me in everyday life") of psychological distress related to somatic symptoms (Toussaint et al., 2016, p. 9).

In the *panel-sample* the EBQ was assessed as predictor variable at T1, and the SSD-12 as lagged criterion at T1 and T2; both variables were rated on 7-point Likert scales ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). In *the clinical replication sample* both variables were rated on 5-point Likert-scales ranging from 0 (*never*) to 4 (*very often*). We also assessed sociodemographic information; psychometric properties can be found in Tables 1 and 2.

Analytic strategy

To test our hypothesis, we used structural equation modelling in *MPlus* with maximum likelihood estimation. We specified a model with Time 2 psychological distress related to somatic symptoms as outcome variable and Time 1 BECU as predictor. Time 1 psychological distress related to somatic symptoms (lagged outcome variable) was included as specific control variable.

We specified both psychological distress related to somatic symptoms and BECU as latent variables: The outcome variable as a general factor with specific residual correlations among items tapping on cognitive, affective or behavioural aspects of psychological distress related to somatic symptoms (Toussaint et al., 2016, p. 9). Loadings were constrained to be equal across the two time-points to ensure the same metric for the latent variables. In a similar vein, the predictor variable (i.e. BECU) was specified as a general factor capturing the three factors of general controllability, negative usefulness and positive usefulness (Becerra et al., 2020, p. 11, model 7). The residuals of the items were allowed to correlate across time (i.e. correlated uniqueness).

Gender, self-consideration as minority, annual income, highest level of education, political orientation and age were included as general control variables. In the *clinical replication sample*, we tested our hypothesis by calculating Spearman's *rho*.

The data that support the findings of this study are not publicly available due to their containing information that could compromise the privacy of research participants. However, on reasonable request, de-identified data are available from the corresponding author.

[1]At both time points, the questionnaire contained additional measures relevant to other research questions of a larger project. However, all data analyses reported in the article are novel and the findings have not been published elsewhere. The same applies to Study 2.

[2]In both studies, we inverse the EBQ-score, so that a high score indicates a participant's belief that positive and negative emotions are controllable and useful.

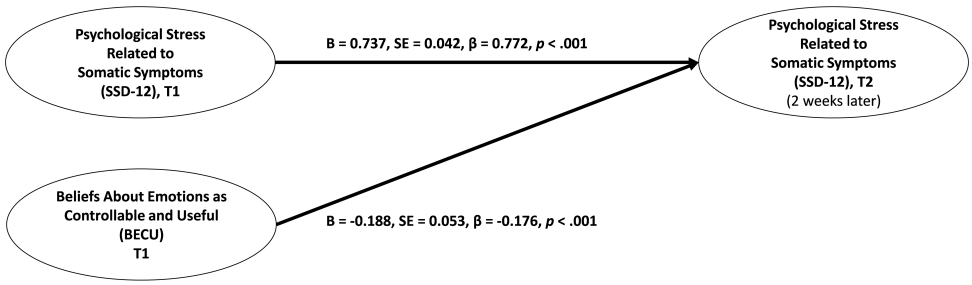
RESULTS

Panel-sample

The model exhibited a good fit (see Figure 1), $\chi^2 = 1764.64$, $df = 882$, $p < .001$, comparative fit index (CFI) = .939; Tucker-Lewis index (TLI) = .928; root mean square error of approximation (RMSEA) = .057, 90% confidence interval (CI) = [.053, .061]; standardized root mean square residual (SRMR) = .047. Supporting our hypothesis, Time 1 BECU negatively predicted Time 2 psychological distress related to somatic symptoms, $B = -.188$, $SE = .053$, $\beta = -.176$, $p < .001$. In addition, Time 1 psychological distress related to somatic symptoms (lagged criterion) was a significant and positive predictor, $B = .737$, $SE = .042$, $\beta = .772$, $p < .001$, no control variable reached statistical significance ($ps \geq .103$). All correlations can be found in Table 1.

Clinical replication sample

In patients diagnosed with a somatoform disorder, we observed a cross-sectional association between BECU and psychological distress related to somatic symptoms of $r_S(87) = -.33$, $p = .002$, in patients diagnosed with a mental disorder other than somatoform of $r_S(557) = -.21$, $p < .001$.[3] Post-hoc power analyses indicated a satisfying power of 90% in the sample of patients diagnosed with a somatoform disorder and 99% in the sample with patients diagnosed with a mental disorder other than somatoform ($\alpha = .05$).



Included, non-significant control-variables:
gender ($p \geq .784$), self-consideration as minority ($p \geq .692$), annual income ($p \geq .729$), highest level of education ($p \geq .909$), political orientation ($p \geq .334$), and age ($p \geq .103$).

Model fit:
$\chi^2 = 1764.64$, $df = 882$, $p < .001$, comparative fit index (CFI) = 0.939; Tucker–Lewis index (TLI) = 0.928; root mean square error of approximation (RMSEA) = 0.057, 90% confidence interval (CI) = [0.053, 0.061]; standardized root mean square residual (SRMR) = 0.047.

FIGURE 1 Model showing the lagged prediction of psychological distress related to somatic symptoms (SSD-12) by beliefs about emotions as controllable and useful (BECU) with a time lag of 2 weeks ($N = 310$). *Note*. Included, non-significant control-variables: gender, self-consideration as minority, annual income, highest level of education, political orientation, age. Model fit: $\chi^2 = 1764.64$, $df = 882$, $p < .001$, comparative fit index (CFI) = .939; Tucker-Lewis index (TLI) = .928; root mean square error of approximation (RMSEA) = .057, 90% confidence interval (CI) = [.053, .061]; standardized root mean square residual (SRMR) = .047. BECU (Beliefs about Emotions as Controllable and Useful) was assessed with the inversed Emotion Beliefs Questionnaire (Becerra et al., 2020), Psychological Stress Related to Somatic Symptoms was assessed with the SSD-12 = Somatic Symptom Disorder-B Criteria Scale (Toussaint et al., 2016).

[3] In order to describe the cross-sectional prediction of SSD by BECU when the control variables of gender, age and education are also included (Table B1), we have presented the regression models for both clinical replication samples in the Appendix B. Importantly, for the sample of patients with somatoform disorder, the predictive correlation (including control variables) is $B = -.306$, $SE = .132$, $\beta = -.271$, $p = .023$. For the clinical sample of patients with mental disorder other than somatoform, the predictive correlation is $B = -.285$, $SE = .060$, $\beta = -.199$, $p < .001$ (including the control variables).

DISCUSSION

We present data on the directional relationship between a genuinely psychological (i.e. malleable) construct – the belief that emotions are controllable and useful – on the one hand, and psychological distress associated with somatic symptoms on the other. We observed in a non-clinical and in a clinical sample that BECU paves the way for and relates to psychological distress associated with somatic symptoms. With a temporal lag of 2 weeks, BECU longitudinally predicted over and above the expected strongest predictor, that is, the lagged criterion, psychological distress associated with somatic symptoms in a sample from the general population. Cross-sectional, BECU is also related to psychological distress associated with somatic symptoms in a clinical sample of patients with a somatoform disorder and in patients with a mental disorder other than somatoform. To the five cross-sectional and qualitative studies described so far (Okur Güney et al., 2019, p. 16), our study adds our observation that BECU predicts and relates to psychological distress in somatoform disorders independently of only one particular somatoform patient population, both in clinical patients (with and also without somatoform disorder) and in general population study participants in a longitudinal design.

Even though we observed the relation between BECU and psychological distress associated with somatic symptoms in a non-clinical and two clinical samples, we might want to take a deeper look – besides minor points such as using different Likert-scales in both samples – to three important limitations of these findings: First and second, we varied two contexts: the national context as well as research participants' health status. The latter one (i.e. the variation of research participants' health status) could be a clear strength of the article. The investigation of a mechanism that can be observed in subclinical as well as in clinical samples could, in the sense of the continuum hypothesis, point to a mechanism that is inherent to humans, not only in a pathological form. The same could be said about the variation of the national context, because if we observed the same association between BECU and psychological distress associated with somatic symptoms in both a clinical and a subclinical sample in a German as well as in a US context, this would even argue for the generalizability of this association at least across the two cultures. If we had observed variation between the two national contexts, we could relate this to other cross-cultural differences, such as the differing value orientations (Reininger et al., 2020; Schwartz, 2008, p. 555). Besides these possible differences due to the variation of the national context, in our case, however, we (unfortunately) varied both contexts (i.e. the national and the health status of the participants), which makes generalizability impossible and allows the results to be understood as only preliminary in any case.

A third relevant limitation of our study is that we exclusively investigated the association of BECU and psychological distress in the context of somatic symptoms without a possible influence of depression. The assumption that especially the development of psychological distress in connection with somatic symptoms is accompanied by negative thoughts about oneself, other people and the future, and that this in turn exerts a crucial influence on the perception of one's own emotions as controllable and useful, is hardly conceivable otherwise. Recent models of the development of somatoform disorders explicitly address the moderating and mediating influence of depression (Arbeitskreis PISO, 2012, p. 22; Duddu et al., 2006; Henningsen et al., 2018; Martin et al., 2007). In future studies, depression needs to be considered as a moderating and mediating factor in the mechanism of action of BECU on psychological distress in somatic symptoms; also our data suggest in an exploratory analysis that depression may play a crucial role.[4] In addition, future research could investigate whether (and when) this directional prediction reinforces the reverse development:

[4]A comorbid depressive disorder present alongside somatoform disorder was empirically associated with higher BECU scores and with lower SSD scores: by calculating a *t*-test in the somatoform clinical replication sample ($N = 101$) between patients having somatoform disorder without depression ($n = 33$) vs. with diagnosed depression ($n = 68$). And interestingly, we observed that these two groups indeed differed in both the extent of BECU, $t(79, 97) = -2.81$, $p = .006$, $d = 0.78$, and the severity of SSD, $t(95) = -4.59$, $p < .001$, $d = 0.75$, suggesting that patients with somatoform disorder and without depressive disorder are more likely to believe that their emotions are controllable and useful ($M = 3.20$, $SD = 0.56$) and to show less distress in relation to somatic symptoms ($M = 2.06$, $SD = 0.74$) than somatoform patients with depressive disorder (BECU: $M = 2.77$, $SD = 1.23$; SSD-12: $M = 2.82$, $SD = 0.76$).

Does psychological distress related to somatic symptoms also pave the way for BECU and if so, *when* does psychological distress influence BECU? This idea seems theoretically reasonable, as BECU includes expectations relying on factual experiences (such as factual experiences of psychological distress patients with persistent somatic symptoms suffer from). In the same vein, future studies should pay attention to other independent variables such as social identity (Hayes et al., 2022) and to a further outcome: the reported physical complaints (as assessed by the PHQ-15; Kroenke et al., 2002).

From a clinical perspective, it might be more relevant to further develop interventions addressing therapists' (e.g. Yamin et al., 2023) but especially patients' BECU. A result of such interventions focussing on affect and the expression of patients' emotion (which is one distinctive feature of psychodynamic-interpersonal psychotherapy; Hilsenroth et al., 2005; Reininger et al., 2023) should be that patients realize that the way they think about their emotions is important, as it affects their level of psychological distress related to somatic symptoms. In psychosomatic care, it might be helpful to find reasons why and to effectively experience that feelings are controllable as one can perceive them, name them and reflect on them. Therefore, one can invest expectancy-based effort in their regulation or set goals that involve emotion regulation. Moreover, psychotherapists should facilitate experiencing emotions within the therapeutic relationship (e.g. Kline et al., 2023). If successful, patients might experience emotions as meaningful for themselves, their lives, their bodily sensations and therefore that emotions can be useful. The useful-meaningful aspect therefore corresponds to the emphasis of emotions and their meaningful relation to bodily sensations as suggested in psychotherapeutic manuals.

For example, the PISO Working Group (Arbeitskreis PISO, 2012, p. 49) recommends the following psychotherapeutic interventions corresponding to the primary treatment foci for patients who are highly focused on somatic symptoms and do not address interpersonal or psychosocial problems: "grasping and taking seriously complaints and grievances, empathically perceiving, mirroring and valuing the related distress of the patient who experiences himself as suffering from somatic symptoms, being interested in the patient and his fate, identifying stressful situations that develop, among other things, as a result of the symptomatology ('stress due to the illness'), and addressing, mirroring, valuing and differentiating the emotions that have arisen" (p. 49). Furthermore, for patients who report psychosocial problems related to the development of the somatic symptoms in addition to the somatic symptoms, the PISO Working Group (Arbeitskreis PISO, 2012, p. 50) recommends these psychotherapeutic interventions: "identify the psychosocial problem and clarify it in terms of its interpersonal meanings, work out psychosomatic explanation models with the patient that can provide a cognitive framework for the patient to develop an inner image of how psychosocial 'stress' and physical reactions may be related, address, mirror, value and differentiate the emotions associated with the psychosocial problem, slowly creating connections between emotions, interpersonal conflicts and somatic symptoms, taking into account the patient's emotions of shame and fear" (p. 50). Moreover, psychotherapeutic interventions can explicitly target the ability of *affective mentalization*. Affective mentalization, as one form of emotion regulation (Schultz-Venrath, 2021; Taubner, 2015, pp. 58–61), enables people to consciously experience and reflect on emotions, to attribute meaning to them both in the here and now and in relation to past experiences, and to control them. In short, these interventions aim to change beliefs about emotions by making them understandable and thus controllable, as well as meaningful and thus useful. In the psychotherapeutic process, three phases can be described to promote affective mentalization (Brockmann et al., 2022, pp. 105–114; Jurist, 2005; McFarquhar et al., 2023): (1) Identifying emotions, (2) Processing emotions and (3) Expressing emotions towards oneself and others. Especially in the identification of emotions, it seems to be important that the therapist adopts a "not-knowing stance" so that the patient can develop their own language for their emotions. Especially, not only the PISO-Manual (2012) but also other psychotherapeutic manuals have been shown to be effective in the treatment of somatoform disorders and somatic symptoms disorders (Abbass et al., 2020; Henningsen et al., 2018; Kleinstäuber et al., 2019; Sattel et al., 2012).

AUTHOR CONTRIBUTIONS

Klaus Michael Reininger: Conceptualization; methodology; data curation; investigation; validation; funding acquisition; formal analysis; supervision; project administration; visualization; writing – original draft; writing – review and editing; resources; software. **Hannah Marie Biel:** Methodology; data curation; formal analysis; project administration; writing – original draft; writing – review and editing. **Timo Hennig:** Conceptualization; methodology; writing – review and editing; writing – original draft. **Steffen Zitzmann:** Data curation; formal analysis; writing – original draft; writing – review and editing; software. **Angelika Weigel:** Investigation; data curation; project administration; writing – original draft; writing – review and editing. **Carsten Spitzer:** Conceptualization; funding acquisition; writing – review and editing; writing – original draft. **Anne Toussaint:** Conceptualization; writing – review and editing; writing – original draft; methodology. **Bernd Löwe:** Conceptualization; supervision; project administration; writing – review and editing; writing – original draft; methodology; resources; validation.

ACKNOWLEDGEMENTS

Data collection of the panel sample was sponsored by the Association of Northern German Universities [Verbund Norddeutscher Universitäten]. The clinical replication sample of this study was preregistered: https://trialsearch.who.int/Trial2.aspx?TrialID=DRKS00026016. Both study protocols were reviewed and approved by Local Psychological Ethics Committee at the Center for Psychosocial Medicine (LPEK) at University Medical Center Hamburg-Eppendorf, approval numbers LPEK-0310 and LPEK-0334. In the panel-sample, informed consent was obtained online; in the clinical replication-sample, written informed consent was obtained from patients. We thank all patients from our psychosomatic outpatient clinics who participated in the study. We also thank Katharina Schulze and Anna de Vries for the data input. Open Access funding enabled and organized by Projekt DEAL.

CONFLICT OF INTEREST STATEMENT

The authors have no conflict of interest to report.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request. The data are not publicly available due to privacy or ethical restrictions.

ORCID

Klaus Michael Reininger https://orcid.org/0000-0002-6671-0465

REFERENCES

Abbass, A., Town, J., Holmes, H., Luyten, P., Cooper, A., Russell, L., Lumley, M. A., Schubiner, H., Allinson, J., Bernier, D., De Meulemeester, C., Kroenke, K., & Kisely, S. (2020). Short-term psychodynamic psychotherapy for functional somatic disorders: A meta-analysis of randomized controlled trials. *Psychotherapy and Psychosomatics*, *89*(6), 363–370. https://doi.org/10.1159/000507738

American Psychiatric Association. (2022). *Diagnostic and statistical manual of mental disorders* (5th ed.), Text Revision. American Psychiatric Association Publishing.

Arbeitskreis PISO. (2012). *Somaforme Störungen – Psychodynamisch-Interpersonelle Therapie (PISO)*. Hogrefe.

Becerra, R., Preece, D. A., & Gross, J. J. (2020). Assessing beliefs about emotions: Development and validation of the emotion beliefs questionnaire. *PLoS One*, *15*(4), e0231395. https://doi.org/10.1371/journal.pone.0231395

Biel, H. M., Löwe, B., Briken, P., Hennig, T., Krott, N. R., Jungclaußen, I., Liebherz, S., Weigel, A., & Reininger, K. M. (2023). Affektive Mentalisierung als wahrgenommene Kontrollierbarkeit und Nützlichkeit von Emotionen. *Die Psychotherapie*, *68*(2), 128–136. https://doi.org/10.1007/s00278-022-00633-7

Brockmann, J., Kirsch, H., & Taubner, S. (2022). *Mentalisieren in der psychodynamischen und psychoanalytischen Psychotherapie–Grundlagen, Anwendungen, Fallbeispiele* (pp. 105–114). Klett-Cotta.

Desai, G., & Chaturvedi, S. K. (2016). Do diagnostic criteria for psychosomatic research explain diagnosis of medically unexplained somatic symptoms? *Psychotherapy and Psychosomatics*, *85*(2), 121–122. https://doi.org/10.1159/000441063

Dimsdale, J. E., & Levenson, J. (2013). What's next for somatic symptom disorder? *American Journal of Psychiatry*, *170*(12), 1393–1395. https://doi.org/10.1176/appi.ajp.2013.13050589

Duddu, V., Isaac, M. K., & Chaturvedi, S. K. (2006). Somatization, somatosensory amplification, attribution styles and illness behaviour: A review. *International Review of Psychiatry*, *18*(1), 25–33. https://doi.org/10.1080/09540260500466790

Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, *39*(2), 175–191. https://doi.org/10.3758/bf03193146

Fava, G. A., Cosci, F., & Sonino, N. (2017). Current psychosomatic practice. *Psychotherapy and Psychosomatics*, *86*(1), 13–30. https://doi.org/10.1159/000448856

Ford, B. Q., & Gross, J. J. (2019). Why beliefs about emotion matter: An emotion-regulation perspective. *Current Directions in Psychological Science*, *28*(1), 74–81. https://doi.org/10.1177/0963721418806697

Freud, S. (1916/1917). *Vorlesungen zur Einführung in die Psychoanalyse*. GW, Bd. XI. Fischer Verlag.

Guidi, J., Lucente, M., Sonino, N., & Fava, G. A. (2021). Allostatic load and its impact on health: A systematic review. *Psychotherapy and Psychosomatics*, *90*(1), 11–27. https://doi.org/10.1159/000510696

Hattie, J. A. C. (2009). *Visible learning – A synthesis of over 800 meta-analyses relating to achievement* (1st ed.). Routledge.

Hayes, S., Carlyle, M., Haslam, S. A., Haslam, C., & Dingle, G. (2022). Exploring links between social identity, emotion regulation, and loneliness in those with and without a history of mental illness. *British Journal of Clinical Psychology*, *61*(3), 701–734. https://doi.org/10.1111/bjc.12358

Henningsen, P. (2020). Körperbeschwerden als Herausforderung der Psychotherapie. *Psychodynamische psychotherapie. PDP*, *19*(4), 382–393. https://doi.org/10.21706/pdp-19-4-382

Henningsen, P., Zipfel, S., Sattel, H., & Creed, F. (2018). Management of functional somatic syndromes and bodily distress. *Psychotherapy and Psychosomatics*, *87*(1), 12–31. https://doi.org/10.1159/000484413

Hilsenroth, M. J., Blagys, M. D., Ackerman, S. J., Bonge, D. R., & Blais, M. A. (2005). Measuring psychodynamic-interpersonal and cognitive-behavioral techniques: Development of the comparative psychotherapy process scale. *Psychotherapy: Theory, Research, Practice, Training*, *42*(3), 340–356. https://doi.org/10.1037/0033-3204.42.3.340

Huang, W.-L., & Liao, S.-C. (2018). Subgrouping somatic symptom disorder: An analysis based on the diagnostic criteria for psychosomatic research. *Psychotherapy and Psychosomatics*, *87*(5), 316–318. https://doi.org/10.1159/000492227

Jurist, E. L. (2005). Mentalized affectivity. *Psychoanalytic Psychology*, *22*(3), 426–444. https://doi.org/10.1037/0736-9735.22.3.426

Kellner, R. (1994). Psychosomatic syndromes, somatization and somatoform disorders. *Psychotherapy and Psychosomatics*, *61*(1–2), 4–24. https://doi.org/10.1159/000288868

Kleinstäuber, M., Allwang, C., Bailer, J., Berking, M., Brünahl, C., Erkic, M., Gitzen, H., Gollwitzer, M., Gottschalk, J.-M., Heider, J., Hermann, A., Lahmann, C., Löwe, B., Martin, A., Rau, J., Schröder, A., Schwabe, J., Schwarz, J., Stark, R., … Rief, W. (2019). Cognitive behaviour therapy complemented with emotion regulation training for patients with persistent physical symptoms: A randomised clinical trial. *Psychotherapy and Psychosomatics*, *88*(5), 287–299. https://doi.org/10.1159/000501621

Kline, K. V., Hill, C. E., Lu, Y., & Gelso, C. J. (2023). Transference and client attachment to therapist in psychodynamic psychotherapy. *Psychotherapy*, 1–10. Advance online publication. https://doi.org/10.1037/pst0000492

Kroenke, K., Spitzer, R. L., & Williams, J. B. (2002). The PHQ-15: Validity of a new measure for evaluating the severity of somatic symptoms. *Psychosomatic Medicine*, *64*(2), 258–266. https://doi.org/10.1097/00006842-200203000-00008

Löwe, B., Andresen, V., Van den Bergh, O., Huber, T. B., von dem Knesebeck, O., Lohse, A. W., Nestoriuc, Y., Schneider, G., Schneider, S. W., Schramm, C., Ständer, S., Vettorazzi, E., Zapf, A., Shedden-Mora, M., & Toussaint, A. (2022). Persistent SOMAtic symptoms ACROSS diseases – From risk factors to modification: Scientific framework and overarching protocol of the interdisciplinary SOMACROSS research unit (RU 5211). *BMJ Open*, *12*(1), e057596. https://doi.org/10.1136/bmjopen-2021-057596

Martin, A., Buech, A., Schwenk, C., & Rief, W. (2007). Memory bias for health-related information in somatoform disorders. *Journal of Psychosomatic Research*, *63*(6), 663–671. https://doi.org/10.1016/j.jpsychores.2007.05.005

McFarquhar, T., Luyten, P., & Fonagy, P. (2023). A typology for the interpersonal affective focus in dynamic interpersonal therapy based on a contemporary interpersonal approach. *Psychotherapy*, *60*(2), 171–181. https://doi.org/10.1037/pst0000462

Okur Güney, Z. E., Sattel, H., Witthöft, M., & Henningsen, P. (2019). Emotion regulation in patients with somatic symptom and related disorders: A systematic review. *PLoS One*, *14*(6), e0217277. https://doi.org/10.1371/journal.pone.0217277

Porcelli, P., & Guidi, J. (2015). The clinical utility of the diagnostic criteria for psychosomatic research: A review of studies. *Psychotherapy and Psychosomatics*, *84*(5), 265–272. https://doi.org/10.1159/000430788

Reininger, K. M., Biel, H. M., Algner-Herzmann, D., Hennig, T., Liebherz, S., Kröger, C., Moritz, S., Briken, P., & Löwe, B. (2023). Validation of the German version of the Comparative Psychotherapy Process Scale (CPPS). *Psychotherapy*. https://doi.org/10.1037/pst0000510

Reininger, K. M., Schaefer, C. D., Zitzmann, S., & Simon, B. (2020). Dynamics of respect: Evidence from two different national and political contexts. *Journal of Social and Political Psychology*, *8*(2), 542–559. https://doi.org/10.5964/jspp.v8i2.1199

Sattel, H., Lahmann, C., Gündel, H., Guthrie, E., Kruse, J., Noll-Hussong, M., Ohmann, C., Ronel, J., Sack, M., Sauer, N., Schneider, G., & Henningsen, P. (2012). Brief psychodynamic interpersonal psychotherapy for patients with

multisomatoform disorder: Randomised controlled trial. *British Journal of Psychiatry*, *200*(1), 60–67. https://doi.org/10.1192/bjp.bp.111.093526

Schwartz, S. H. (2008). *Cultural value orientations: Nature and implications of national differences*. State University—Higher School of Economics Press.

Schultz-Venrath, U. (2021). *Mentalisieren des Körpers – Mentalisieren in Klinik und Praxis*. Klett-Cotta.

Seitz, K. I., Ehler, N., Schmitz, M., Schmitz, S. E., Dziobek, I., Herpertz, S. C., & Bertsch, K. (2022). Affective and cognitive theory of mind in posttraumatic stress, major depressive, and somatic symptom disorders: Association with childhood trauma. *British Journal of Clinical Psychology*, *61*(3), 680–700. https://doi.org/10.1111/bjc.12357

Subic-Wrana, C., Beutel, M. E., Knebel, A., & Lane, R. D. (2010). Theory of mind and emotional awareness deficits in patients with somatoform disorders. *Psychosomatic Medicine*, *72*(4), 404–411. https://doi.org/10.1097/PSY.0b013e3181d35e83

Taubner, S. (2015). *Konzept Mentalisieren – Eine Einführung in Forschung und Praxis* (pp. 58–61). Psychosozial-Verlag.

Toussaint, A., Murray, A. M., Voigt, K., Herzog, A., Gierk, B., Kroenke, K., Rief, W., Henningsen, P., & Löwe, B. (2016). Development and validation of the somatic symptom disorder–B criteria scale (SSD-12). *Psychosomatic Medicine*, *78*(1), 5–12. https://doi.org/10.1097/psy.0000000000000240

Van Den Eede, F., & van der Feltz-Cornelis, C. (2018). The need to distinguish between bodily distress disorder and somatic symptom disorder. *Psychotherapy and Psychosomatics*, *87*(4), 234–235. https://doi.org/10.1159/000490731

Van der Feltz-Cornelis, C. M., & Van Dyck, R. (1997). The notion of somatization: An artefact of the conceptualization of body and mind. *Psychotherapy and Psychosomatics*, *66*(3), 117–127. https://doi.org/10.1159/000289121

World Health Organization. (2016). *International statistical classification of diseases and related health problems* (10th ed.). World Health Organization. https://icd.who.int/browse10/2016/en

Yamin, J. B., Cannoy, C. N., Gibbins, K. M., Krohner, S., Rapport, L. J., Trentacosta, C. J., Zeman, L. L., & Lumley, M. A. (2023). Experiential training of mental health graduate students in emotional processing skills: A randomized, controlled trial. *Psychotherapy*, 1–13. Advance online publication. https://doi.org/10.1037/pst0000495

How to cite this article: Reininger, K. M., Biel, H. M., Hennig, T., Zitzmann, S., Weigel, A., Spitzer, C., Toussaint, A., & Löwe, B. (2023). Beliefs about emotions predict psychological stress related to somatic symptoms. *British Journal of Clinical Psychology*, *62*, 699–716. https://doi.org/10.1111/bjc.12438

APPENDIX A

Psychiatric diagnoses in two German psychosomatic outpatient samples

TABLE A1 Psychiatric diagnosis in a psychosomatic outpatient sample diagnosed with somatoform disorders ($n = 101$).

Block according to chapter V, ICD-10	Subdivisions		*n*
F1: Mental and behavioural disorders due to psychoactive substance use			∑2
	F13: Mental and behavioural disorders due to use of sedatives or hypnotics	F13.2: Dependence syndrome	1
	F17: Mental and behavioural disorders due to use of tobacco	F17.2: Dependence syndrome	1
F3: Mood [affective] disorders			∑71
	F31: Bipolar affective disorder	F31.3: Bipolar affective disorder, current episode mild or moderate depression	1
	F32: Depressive episode	F32.0: Mild depressive episode	4
		F32.1: Moderate depressive episode	27
		F32.2: Severe depressive episode without psychotic symptoms	3
	F33: Recurrent depressive disorder		1
		F33.1: Recurrent depressive disorder, current episode moderate	27
		F33.2: Recurrent depressive disorder, current episode severe without psychotic symptoms	5
	F34: Persistent mood [affective] disorders	F34.1: Dysthymia	3
F4: Neurotic, stress-related and somatoform disorders			∑109
	F41: Other anxiety disorders	F41.1: Generalized anxiety disorder	3
		F41.9: Anxiety disorder, unspecified	1
	F43: Reaction to severe stress, and adjustment disorders	F43.1: Post-traumatic stress disorder	1
		F43.2: Adjustment disorders	2
	F44: Dissociative [conversion] disorders	F44.5: Dissociative convulsions	1
	F45: Somatoform disorders	**F45.0: Somatization disorder**	**7**
		F45.1: Undifferentiated somatoform disorder	**2**
		F45.3: Somatoform autonomic dysfunction	**15**
		F45.4: Persistent somatoform pain disorder	**71**
		F45.8: Other somatoform disorders	**5**
		F45.9: Somatoform disorder, unspecified	**1**

(Continues)

TABLE A1 (Continued)

Block according to chapter V, ICD-10	Subdivisions		*n*
F5: Behavioural syndromes associated with physiological disturbances and physical factors			∑14
	F50: Eating disorders	F50.1: Atypical anorexia nervosa	1
	F51: Non-organic sleep disorders	F51.0: Non-organic insomnia	2
	F54: Psychological and behavioural factors associated with disorders or diseases classified elsewhere		11
F6: Disorders of adult personality and behaviour			∑3
	F60: Specific personality disorders	F60.3: Emotionally unstable personality disorder	1
	F61: Mixed and other personality disorders		1
	F62: Enduring personality changes, not attributable to brain damage and disease	F62.0: Enduring personality change after catastrophic experience	1
		1 diagnosis	21
		2 diagnoses	67
		3 diagnoses	9
		4 diagnoses	4

Note. Diagnosis according to International Statistical Classification of Diseases and Related Health Problems 10th revision 5th edition (WHO, 2016; ICD-10; retrieved July 18th from https://apps.who.int/iris/bitstream/handle/10665/246208/9789241549165-V1-eng.pdf?sequence=1&isAllowed=y), Chapter V (Mental and behavioural disorders). Somatoform disorders ($n = 101$) in bold.

TABLE A2 Psychiatric diagnosis in a German psychosomatic outpatient sample diagnosed apart from somatoform disorders ($n = 628$).

Block according to chapter V, ICD-10	Subdivisions		*n*
F1: Mental and behavioural disorders due to psychoactive substance			∑32
	F10: Mental and behavioural disorders due to use of alcohol	F10.1: Harmful use	8
		F10.2: Dependence syndrome	5
	F11: Mental and behavioural disorders due to use of opioids	F11.2: Dependence syndrome	1
	F12: Mental and behavioural disorders due to use of cannabinoids	F12.1: Harmful use	9
		F12.2: Dependence syndrome	6
	F13: Mental and behavioural disorders due to use of sedatives or hypnotics	F13.1: Harmful use	1
		F13.2: Dependence syndrome	1
	F17: Mental and behavioural disorders due to use of tobacco	F17.1: Harmful use	1
F2: Schizophrenia, schizotypal and delusional disorders			∑4
	F20: Schizophrenia	F20.0: Paranoid schizophrenia	3
	F29: Unspecified non-organic psychosis		1
F3: Mood [affective] disorders			∑448
	F31: Bipolar affective disorder	F31.4: Bipolar affective disorder, current episode severe depression without psychotic symptoms	1
	F32: Depressive episode	F32.0: Mild depressive episode	22
		F32.1: Moderate depressive episode	172
		F32.2: Severe depressive episode without psychotic symptoms	51
		F32.3: Severe depressive episode with psychotic symptoms	1
	F33: Recurrent depressive disorder	F33.0: Recurrent depressive disorder, current episode mild	16
		F33.1: Recurrent depressive disorder, current episode moderate	149
		F33.2: Recurrent depressive disorder, current episode severe without psychotic symptoms	27
		F33.4: Recurrent depressive disorder, currently in remission	1
	F34: Persistent mood [affective] disorders	F34.1: Dysthymia	7
	F38: Other mood [affective] disorders		1
F4: Neurotic, stress-related and somatoform disorders			∑193

(Continues)

TABLE A2 (Continued)

Block according to chapter V, ICD-10	Subdivisions		*n*
	F40: Phobic anxiety disorders	F40.0: Agoraphobia	12
		F40.1: Social phobias	6
		F40.2: Specific (isolated) phobias	7
	F41: Other anxiety disorders	F41.0: Panic disorder [episodic paroxysmal anxiety]	20
		F41.1: Generalized anxiety disorder	4
		F41.2: Mixed anxiety and depressive disorder	30
		F41.9: Anxiety disorder, unspecified	2
	F42: Obsessive-compulsive disorder	F42.0: Predominantly obsessional thoughts or ruminations	4
		F42.1: Predominantly compulsive acts [obsessional rituals]	7
		F42.2: Mixed obsessional thoughts and acts	9
	F43: Reaction to severe stress, and adjustment disorders	F43.1: Post-traumatic stress disorder	21
		F43.2: Adjustment disorders	55
		F43.8: Other reactions to severe stress	1
		F43.9: Reaction to severe stress, unspecified	1
	F44: Dissociative [conversion] disorders	F44.4: Dissociative motor disorders	1
		F44.5: Dissociative convulsions	1
		F44.9: Dissociative [conversion] disorder, unspecified	2
	F45: Somatoform disorders	F45.2: Hypochondriacal disorder	9
	F48: Other neurotic disorders	F48.1: Depersonalization-derealization syndrome	1
F5: Behavioural syndromes associated with physiological disturbances and physical factors			∑274
	F50: Eating disorders	F50.0: Anorexia nervosa	35
		F50.1: Atypical anorexia nervosa	20
		F50.2: Bulimia nervosa	15
		F50.3: Atypical bulimia nervosa	8
		F50.8: Other eating disorders	5
		F50.9: Eating disorder, unspecified	26
	F51: Non-organic sleep disorders	F51.0: Non-organic insomnia	5
		F51.5: Nightmares	1
	F52: Sexual dysfunction, not caused by organic disorder or disease	F52.2: Failure of genital response	1
	F54: Psychological and behavioural factors associated with disorders or diseases classified elsewhere		158

TABLE A2 (Continued)

Block according to chapter V, ICD-10	Subdivisions		*n*
F6: Disorders of adult personality and behaviour			∑15
	F60: Specific personality disorders	F60.0: Paranoid personality disorder	1
		F60.3: Emotionally unstable personality disorder	7
		F60.8: Other specific personality disorders	1
		F60.9: Personality disorder, unspecified	1
	F61: Mixed and other personality disorders		1
	F63: Habit and impulse disorders	F63.0: Pathological gambling	1
		F63.8 Other habit and impulse disorders	1
	F64: Gender identity disorders	F64.0: Transsexualism	1
F8: Disorders of psychological development			∑2
	F81: Specific developmental disorders of scholastic skills	F81.0: Specific reading disorder	1
	F84: Pervasive developmental disorders	F84.5: Asperger syndrome	1
F9: Behavioural and emotional disorders with onset usually occurring in childhood and adolescence			∑8
	F90: Hyperkinetic disorders	F90.0: Disturbance of activity and attention	7
	F95: Tic disorders	F95.0: Transient tic disorder	1
		1 diagnosis	320
		2 diagnoses	276
		3 diagnoses	22
		4 diagnoses	10

Note. Diagnosis according to International Statistical Classification of Diseases and Related Health Problems 10th revision 5th edition (WHO, 2016; ICD-10; retrieved 18 July from https://apps.who.int/iris/bitstream/handle/10665/246208/9789241549165-V1-eng.pdf?sequence=1&isAllowed=y), Chapter V (Mental and behavioural disorders).

APPENDIX B

Regression analysis

TABLE B1 Regression coefficients of beliefs about emotions being controllable and useful (BECU) on psychological distress related to somatic symptoms using both clinical replication samples and including control variables.

	Model 1			Model 2		
Variable	***B***	β	***SE***	***B***	β	***SE***
Patients with somatoform disorders (*n* = 101)						
Constant	2.28***		.15	2.15***		.43
BECU	.27*	.24	.12	.31*	.27	.13
Gender				−.04	−.03	.19
Age				−.00	−.00	.01
Education				.04	.08	.05
R^2	.06				.06	
Δ R^2					.01	
Patients with diagnosed mental disorders apart from somatoform disorders (*n* = 628)						
Constant	1.73***		.08	2.00***		.18
BECU	.33***	.23	.06	.29***	.20	.06
Gender				−.01	−.00	.08
Age				.00	.06	.00
Education				−.09***	−.15	.02
R^2	.05				.08	
Δ R^2					.03**	

Note. BECU (Beliefs about emotions as controllable and useful) was assessed with the inversed *Emotion Beliefs Questionnaire* (EBQ; Becerra et al., 2020, German version: Biel et al., 2023), psychological distress related to somatic symptoms was assessed with the *Somatic Symptom Disorder-B Criteria Scale* (SSD-12; Toussaint et al., 2016).

We examined the impact of BECU on psychological distress related somatic symptoms. In Model 1, we entered BECU (assessed with EBQ) as a predictor. In Model 2, we entered the control variables of gender, age and education in addition to BECU (assessed with EBQ) to predict psychological distress related to somatic symptoms (assessed with SSD-12).

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