Journal of Affective Disorders 373 (2025) 429–437

Contents lists available at ScienceDirect

Journal of Affective Disorders

journal homepage: www.elsevier.com/locate/jad

Research paper

Somatic symptom disorder and the role of epistemic trust, personality functioning and child abuse: Results from a population-based representative German sample

Hanna Kampling [a,*], David Riedl [b,c], Astrid Lampe [b,d], Tobias Nolte [e,f], Elmar Brähler [g,h], Mareike Ernst [i], Jörg M. Fegert [j,k], Tobias Geisel [l], Nora Hettich-Damm [g], Andreas Jud [j], Sandra Zara [a], Johannes Kruse [a,l]

[a] Department of Psychosomatic Medicine and Psychotherapy, Justus Liebig University Giessen, Giessen, Germany
[b] Ludwig Boltzmann Institute for Rehabilitation Research, Vienna, Austria
[c] Department of Psychiatry, Psychotherapy, Psychosomatics and Medical Psychology, Medical University of Innsbruck, Innsbruck, Austria
[d] VAMED Rehabilitation Center, Schruns, Austria
[e] Anna Freud National Centre for Children and Families, London, United Kingdom
[f] Research Department of Clinical, Educational and Health Psychology, UCL, London, United Kingdom
[g] Department of Psychosomatic Medicine and Psychotherapy, University Medical Center of the Johannes Gutenberg University Mainz, Mainz, Germany
[h] Integrated Research and Treatment Center for Adiposity Diseases, Behavioral Medicine Research Unit, University Medical Center Leipzig, Leipzig, Germany
[i] Department of Clinical Psychology, Psychotherapy and Psychoanalysis, Department of Psychology, University of Klagenfurt, Klagenfurt am Wörthersee, Austria
[j] Department of Child and Adolescent Psychiatry/Psychotherapy, University of Ulm, Ulm, Germany
[k] German Center for Mental Health (DZPG), partner site Ulm, Germany
[l] Department for Psychosomatic Medicine and Psychotherapy, Medical Center of the Philipps University Marburg, Marburg, Germany

ARTICLE INFO

Keywords:
Child abuse
Somatic symptom disorder
Personality functioning
Epistemic trust
Structural equation modelling
Population-based representative data

ABSTRACT

Background: A growing body of evidence explored symptom burden of somatic symptom disorder (SSD) and its complex etiology involving psychosocial aspects. Child abuse has been linked to numerous psychopathologies including somatic symptoms as well as impaired personality functioning and disruptions in epistemic trust. This work aims to investigate personality functioning and epistemic trust in the association between child abuse and somatic symptom burden.

Methods: We conducted structural equation modelling (SEM) using representative data of the German population ($N = 2436$). Personality functioning (OPD-SQS) was applied as a mediator between retrospectively recalled child abuse (ICAST-R) and somatic symptom burden (SSS-8, SSD-12, 6 month time criterion), while epistemic trust was added as a predictor of personality functioning.

Results: 6.8 % ($n = 166$) of participants self-reported SSD. Prevalence of child abuse (53.6 % vs. 31.7 %; $\chi^2 = 33.44$, $p < .001$) was significantly higher among those with SSD. Child abuse was significantly associated with somatic symptom burden (criterion A: $\beta = 0.23$, 95 %-CI: 0.19–0.27, $p < .001$; criterion B ($\beta = 0.24$, 95 %-CI: 0.20–0.28, $p < .001$) and explained 6 % and 5 % of its variance respectively. Adding personality functioning as a mediator increased the explained variance to 28 % for both somatic symptom burden criterion A and B. Including epistemic trust further increased the explained variance of personality functioning (from 15 to 36 %).

Limitations: All assessments and results are based on self-report and cross-sectional data.

Conclusions: Impairments in personality functioning and disruptions in epistemic trust might play an important role in experiencing symptoms of SSD. Both domains thus present new avenues for treatment improvement and further research in patients with SSD.

* Corresponding author at: Department of Psychosomatic Medicine and Psychotherapy, Justus Liebig University, Giessen, Germany.
E-mail address: hanna.kampling@psycho.med.uni-giessen.de (H. Kampling).

https://doi.org/10.1016/j.jad.2024.12.096
Received 23 May 2024; Received in revised form 19 December 2024; Accepted 27 December 2024
Available online 28 December 2024

1. Introduction

As part of the fifth revision of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), diagnostic criteria and nomenclature of various diagnoses included in the DSM-IV like somatoform disorder, hypochondriasis, and pain disorders were re-conceptualized in order to better define them and to increase clinical utility, particularly in – but not confined to – primary care settings. Therefore, in 2013, the American Psychiatry Association (APA) introduced 'somatic symptom disorder' (SSD) as a new diagnosis in the DSM-5 (Dunphy et al., 2019; Löwe et al., 2022; Pinto et al., 2023). Diagnostic criteria of SSD comprise one or more somatic distressing or disabling symptoms (criterion A); one or more endorsed symptoms of excessive thoughts, feelings, and/or behaviors related to the somatic symptoms (criterion B) including a cognitive, affective, and a behavioral dimension; as well as criterion C, persistency for more than six months (Henningsen, 2018; Löwe et al., 2022). This new conceptualization explicitly allows for SSD to be diagnosed in addition to any comorbid somatic disease, and thereby, overcoming the preexisting mind−body dualism as well as the equating of medically/organically unexplained with psychogenic (Löwe et al., 2022). A recent scoping review summarized empirical evidence on SSD supporting the diagnostic criteria's reliability, validity, and clinical utility (Löwe et al., 2022). Moreover, a study based on qualitative data from focus groups with general practitioners reported the perceived advantages of the SSD criteria (Lehmann et al., 2019).

Since its introduction, a growing body of evidence assessed the prevalence and symptom burden of SSD. Even though prevalence studies based on structured clinical interviews are still lacking, self-report based prevalence rates are estimated to be 12.9 % in the general population (Löwe et al., 2022), and about 55 % in a clinical sample of patients in a psychosomatic outpatient clinic setting (Hüsing et al., 2018). Overall, the physical and psychological symptom burden of SSD is high, with SSD being associated with elevated suicide risk, all-cause mortality, functional impairment, psychiatric hospitalization, usage of psychiatric medication and analgesics, medical costs, comorbidities with anxiety and depressive disorders, as well as decreased quality of life (Löwe et al., 2022; Wu et al., 2023).

Yet, the etiology of SSD remains unclear. One risk factor that has long been associated with multimorbidity, chronic and severe somatic symptoms, or somatoform complaints in adulthood is a history of adverse childhood experiences (ACEs), comprising experiences of physical, sexual, or emotional abuse, as well as physical and emotional neglect (Atkinson et al., 2023; Beutel et al., 2017; Kurlansik and Maffei, 2016). A recent study demonstrated that more severe ACEs were linked to more somatic symptom burden, and moreover, that this link was driven by sexual and emotional abuse but not physical abuse or neglect (Eilers and Het Rot, 2023). Further studies demonstrated associations between ACEs more generally and sexual abuse more specifically with somatization disorder (Pinto et al., 2023; Spitzer et al., 2008), or sexual and emotional abuse as well as physical neglect with somatoform disorder (Piontek et al., 2021). Even though this data suggests a close association between ACEs and SSD, the underlying mechanisms remain elusive.

In order to better understand how ACEs confer risk for adult psychopathology, recent research has been considering the transdiagnostic role of impaired personality functioning and mentalizing. While personality functioning describes a person's abilities directed towards the self (identity perception, self-regulation) and others (empathy, intimacy) in four domains related to capacities of cognition/perception, regulation, communication, and attachment (Ehrenthal and Benecke, 2019), mentalizing refers to psychological capacities such as emotional awareness or the attribution of intentional mental states to experiences and behavior (Berens et al., 2021; Riedl et al., 2022). Given that experiences in early childhood are essential for the development of personality functioning and mentalizing (Beebe et al., 2010; Fonagy et al., 2019; Kernberg, 1993), disruptions through ACEs may explain impairments in later life. Impaired personality functioning and mentalizing have already been proposed as transdiagnostic risk factors by linking ACEs with various mental health difficulties such as depression and anxiety symptoms, dissociation, posttraumatic and complex posttraumatic stress disorder (PTSD) symptoms, body dysmorphic concerns, and self-harm (Ernst et al., 2022; Freier et al., 2022a, 2022b; Kampling et al., 2022; Krakau et al., 2021; Wagner-Skacel et al., 2022). A recent systematic review on SSD and somatization highlights that even though the discussion on correlations between personality disorders and somatization poses hardly a new issue with known overlaps between SSD and personality disorders from all clusters, dimensional personality models in relation to SSD are still in strong need (Macina et al., 2021).

Concerning the detrimental impact of ACEs, epistemic trust has attracted wide interest within the last few years. It has been proposed that secure attachment relationships are not only crucial for the development of personality functioning in infancy, but also for enabling social learning (Bo et al., 2017; Fonagy et al., 2017; Fonagy and Allison, 2014). The epistemic stance describes the position an individual takes regarding the openness towards social knowledge while considering the relation to oneself and others, both as 'providers of knowledge' and 'receivers of knowledge' (Fonagy and Allison, 2023). Healthy development results in the capacity for epistemic trust, and therefore, the willingness to consider new knowledge from another person as trustworthy, generalizable, and relevant to the self (social learning) (Fonagy and Allison, 2014). However, ACEs can disrupt this process, leading to epistemic mistrust (a tendency to consider all information sources as unreliable or ill-intended, accompanied by resistance to being influenced by others) or epistemic credulity (a lack of vigilance and discrimination between trustworthy and untrustworthy information, rendering individuals more vulnerable to misinformation and exploitation) (Campbell et al., 2021; Nolte et al., 2023). It has been suggested that many types of psychopathology could be characterized by temporary or permanent disruptions of epistemic trust and the social learning process it enables (Fonagy and Campbell, 2017). The resulting epistemic isolation alongside social trauma like child abuse is associated with ineffective mentalizing (e.g., in terms of inadequate affect perception) (Bateman, 2023), and thus, might be involved in the development of SDD. Considering disruptions in epistemic trust as a transdiagnostic factor in patients with SSD might help to better understand the considerable difficulties these patients encounter when they find themselves in need of placing their trust in their professional health network.

1.1. Aim of this study

The present study aims to clarify the role of epistemic trust and personality functioning in the association between child abuse and SSD. In line with previous research and theory, we hypothesize that (I) experiences of child abuse relate to higher rates of SSD in the general population, (II) child abuse corresponds to greater impairment in personality functioning and epistemic trust, and finally (III) personality functioning and epistemic trust mediate the association between child abuse and SSD.

2. Methods

Data was collected from July to October 2021 by the independent research institute USUMA GmbH Berlin. A representative sample of the German population was surveyed by applying a random route procedure. Households within 258 predefined regions were selected randomly, in households with multiple persons, the Kish-Selection-Grid (Kish, 1949) was applied. Inclusion criteria were sufficient German language skills, an age > 16 and informed consent before study participation. The data comprised $N = 2515$ eligible interviews. The study was conducted in accordance with the Declaration of Helsinki and fulfilled the ethical guidelines of the International Code of Marketing and Social Research

Practice of the International Chamber of Commerce and the European Society of Opinion and Marketing Research. Ethical approval was obtained from the Ethics Committee of the Medical Faculty of the University of Leipzig (no. 298/21-ek).

2.1. Child abuse – ICAST-R

Child abuse was assessed retrospectively with the self-report questionnaire ISPAN Child Abuse Screening Tools-Retrospective (ICAST-R). Consisting of 36 items, it covers experiences of sexual, physical and emotional child abuse and neglect with binary response options (yes/no). The ICAST-R is a valid and widely used epidemiological screening instrument with moderate to good reliability (Cronbach's α = 0.82 for sexual abuse, 0.61 for physical abuse and 0.63 for emotional abuse) (Dunne et al., 2009; Jarczok et al., 2023). In the present study, Cronbach's α was acceptable (sexual abuse: α = 0.78, physical abuse: α = 0.75, and emotional abuse: α = 0.73).

2.2. Personality functioning – OPD-SQS

Impairments in personality functioning were assessed with the Operationalized Psychodynamic Diagnosis Structure Questionnaire - Short Form (OPD-SQS). It is a self-report questionnaire comprising the subscales with four items each, 1) self-perception (e.g., 'I sometimes feel like a stranger to myself.', 2) interpersonal contact (e.g., 'I sometimes misjudge how my behaviour affects others.'), and 3) relationship model (e.g., 'If others know a lot about me I often feel somehow controlled or observed.'). Response options range from 0 = 'does not apply at all' to 4 = 'fully applies', resulting in a sum score ranging from 0 to 48, with higher scores indicating more severe deficits in personality functioning. Previous studies showed good internal consistency (α = 0.88) (Ehrenthal et al., 2015, 2023). In the present study, Cronbach's alpha was good for both the total scale and the subscales (total: α = 0.91, self-perception: α = 0.88, interpersonal contact: α = 0.82 and relationship model: α = 0.84). In the present study the OPD-SQS total score was used for all calculations if not clearly stated otherwise.

2.3. Epistemic trust, mistrust and credulity questionnaire

To assess epistemic trust, mistrust, and credulity, the Epistemic Trust, Mistrust and Credulity Questionnaire (ETMCQ) (Campbell et al., 2021; Nolte, n.d., under review) was used. It consists of 15 items with response options ranging from 1 = 'strongly disagree' to 7 = 'strongly agree', resulting in a sum score ranging from 15 to 105. High trust reflects a persons' openness to social learning, while people with high mistrust tend to treat information sources as unreliable and ill-intended and avoid being influenced by communication from others. High credulity refers to a persons' lack of clarity vis-à-vis their own position, tending to be more vulnerable to misinformation and exploitation. The ETMCQ has shown good reliability and validity (total scale: Cronbach's α = 0.71–0.78). In our sample, internal consistency was acceptable for the total scale (α = 0.73) and acceptable to good for trust (α = 0.83), mistrust (α = 0.82) and credulity (α = 0.70).

2.4. Somatic symptom burden and somatic symptom disorder – SSS-8 and SSD-12

The Somatic Symptom Scale-8 (SSS-8) was used to assess the A criterion during the last 7 days (Gierk et al., 2014). It is a shortened version of the Patient Health Questionnaire-15 (PHQ-15) (Kroenke et al., 2002), comprising 8 items with response options ranging from 0 = 'not at all' to 4 = 'very much'. With a sum score ranging between 0 and 32, higher scores indicate a greater symptom burden. Cut-off scores can be used to indicate minimal (0–3), low (4–7), medium (8–11), high (12–15), and very high (16–32) symptom burden. The SSS-8 has shown good validity and reliability (α = 0.81) (Gierk et al., 2014). In the present study, good internal consistency was observed (α = 0.85).

The B criterion can be assessed with the SSD B Criteria Scale-12 (SSD-12) (Toussaint et al., 2016). Addressing cognitive, affective and behavioral aspects with 4 items each, response options range from 0 = 'never' to 4 = 'very often', resulting in a sum score between 0 and 48. Higher values indicate higher burden. The SSD-12 showed excellent reliability with Cronbach's α = 0.95 (Toussaint et al., 2016). In the present study, the time criterion of 6 months (criterion C) was assessed with an additional item ('My somatic complaints have been with me most days of the last six months'). We observed excellent internal consistency (α = 0.96).

To efficiently screen for SSD, we combined criteria A, B and C by assessing the A and B criteria separately using the suggested best efficiency values of a cut-off of ≥ 9 in the SSS-8 and ≥ 23 in the SSD-12 and considering the 6-month time criterion C (Toussaint et al., 2019).

2.5. Statistical analyses

Demographics for the sample are presented with means (M) and standard deviations (SD). Participants with missing data for the SSS-8, SSD-12, and ICAST-R were excluded from the analysis. For the ETMCQ and OPD-SQS, patterns of missing data were analyzed using Little's test (Little, 1988) and in case of data missing completely at random (MCAR), data was imputed using the EM-algorithm.

Sociodemographic and clinical data of the excluded sample were compared to the study sample using independent *t*-tests and χ^2-tests. The size of group differences was estimated using Hedges g' for metric and ϕ for nominal data. Values of g' = 0.2/ϕ = 0.1, g' = 0.5/ϕ = 0.3 and g' = 0.8/ϕ = 0.5 represent small, medium and large effect sizes, respectively.

The relationships between child abuse, epistemic trust, personality functioning and somatic symptom burden criterion A and B were investigated with structural equation models (SEM; see Fig. 1). In step 1, the direct influence of child abuse on somatic symptom burden criterion A and B was tested. In step 2, personality functioning as operationalized by the OPD-SQS total score was added as a mediator for this relationship, and in step 3, the ETMCQ was added as predictor of personality functioning and somatic symptom burden criterion A and B. Since the model would result in 0 degrees of freedom, thus preventing AMOS (Analysis of Moment Structures, a comprehensive statistical software package designed for SEM) from calculating the model's fit indices, we decided to report the model without the non-significant paths.

To account for non-normal data distribution, bootstrapped confidence intervals (5,000 samples, 95 %-CI) were calculated to evaluate the statistical significance of all paths included in the SEM. To determine the model's goodness of fit, Pearson's chi-squared test (χ^2), the comparative fit index (CFI), Tucker-Lewis Index (TLI) and root mean square error of approximation (RMSEA) with lower and higher bounds of the 95 %-CI were calculated. To evaluate whether the empirical data closely fit the theoretical model, the *p*-value of Close Fit (PCLOSE) was calculated based on the RMSEA values, with values of $p > .05$ indicating close fit and $p < .05$ indicating worse than close model fit. The Bollen-Stine bootstrapping procedure was used to further test the correctness of the model hypothesis (Bollen and Stine, 1992). Acceptable goodness of fit was defined as RMSEA values of <0.08,CFI/TLI values >0.90 and Bollen-Stine $p > .05$. In all other instances *p*-values <.05 (two-sided) were considered statistically significant. Statistical analyses were performed with IBM SPSS (v22.0) and SPSS AMOS (v24.0).

3. Results

3.1. Sample characteristics

A total of $N = 2515$ persons participated in the study. Of these, $n = 79$ participants (3.1 %) were excluded because of missing data. The remaining $n = 2436$ participants were included in the final analysis. Participants' mean age was 50.1 years. A small majority were female

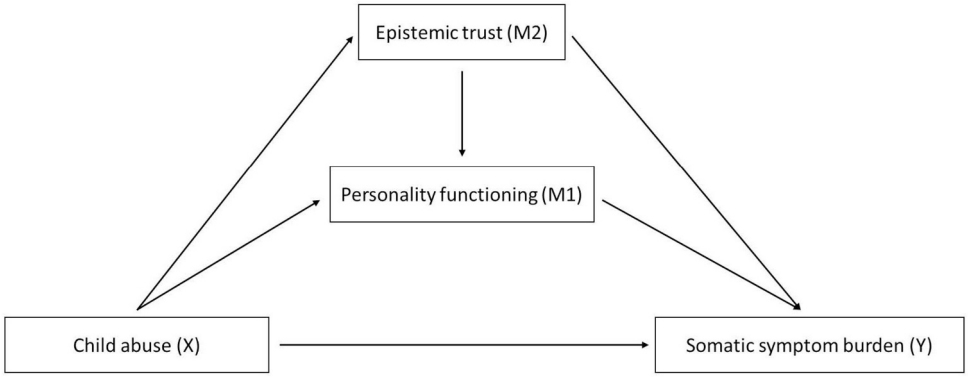

Fig. 1. Structural equation model to test the mediation effect of personality functioning and epistemic trust on the relationship between child abuse and somatic symptom burden in adulthood. Association of child abuse (X) and somatic symptom burden (Y), mediated by personality functioning (M1), which was predicted by epistemic trust (M2).

(51.8 %), married (41.2 %) or lived with a partner (51.4 %), had an education ranging from 10 to 13 years of school (58.7 %), and worked full-time (45.2 %). Most participants earned a net monthly household income between 1250 € and 2499 € (40.2 %). Participants with SSD (combined use of the SSS-8, SSD-12, and symptoms persisting for at least six months) were significantly older, less well educated, more likely to be divorced, widowed, or retired (see also age), and had a lower income compared to participants without SSD. In addition, significantly more participants with SSD reported physical and emotional abuse in childhood, impaired personality functioning, as well as higher epistemic mistrust and epistemic credulity. For more details, see Table 1.

3.2. Frequency and association of child abuse and somatic symptom burden in adulthood

A total of $n = 809$ (33.2 %) participants reported experiencing at least one form of child abuse. Emotional abuse was the most prevalent form (22.9 %), followed by physical abuse (21.1 %), and sexual abuse (9.4 %).

6.8 % ($n = 166$) of the participants fulfilled the criteria for SSD (and 7.6 % ($n = 186$)) based on SSS-8 and SSD-12 alone, omitting the time criterion). Experiences of any kind of child abuse were associated with a 2.5 times increased likelihood for SSD (OR = 2.49, 95 %-CI: 1.81–3.42, $p < .001$). Specifically, sexual abuse was not significantly associated with SSD (OR = 1.23, $p = .38$), while physical abuse was associated with a two-fold (OR = 1.93, 95 %-CI: 1.30–2.86, $p = .001$) and emotional abuse with a 1.8-times increased likelihood for SSD (OR = 1.81, 95 %-CI: 1.22–2.69, $p = .003$).

Significantly more participants with SSD than without reported child abuse, with a small effect size ($p < .001$, $\phi = 0.117$). Additionally, greater impairments in personality functioning with a large effect size ($p < .001$, g = 1.40), and epistemic trust with a moderate to large effect size ($p < .001$, g = 0.75) were reported by participants with SSD.

3.3. Personality functioning and epistemic trust as mediators of the association between child abuse and somatic symptom burden in adulthood

In a first step, the direct associations of child abuse with the somatic symptom burden criterion A and B were investigated by calculating a SEM (see Fig. 2). Child abuse significantly predicted somatic symptom burden criterion A (β = 0.23, 95 %-CI: 0.19–0.27, $p < .001$) and criterion B (β = 0.24, 95 %-CI: 0.20–0.28, $p < .001$), explaining 6 % and 5 % of the variance, respectively. Since the number of distinct sample moments was equal to the number of distinct parameters to be estimated (resulting in zero degrees of freedom), model fit indices could not be calculated.

In a second step, personality functioning (OPD-SQS total score) was added as a mediator of the relationship between child abuse and somatic symptom burden criterion A and B (see Fig. 3). The overall explained variance of somatic symptom burden substantially increased from 6 to 28 % and 5 % to 28 % respectively and the direct association of child abuse with somatic symptom burden criterion A was substantially reduced (β = 0.04, 95 %-CI: 0.004–0.082, $p = .033$) and no longer statistically significant with criterion B (β = 0.03, 95 %-CI: -0.006–0.073, $p = .11$). Personality functioning was significantly associated with child abuse (β = 0.39, 95 %-CI: 0.35–0.42, $p < .001$) and somatic symptom burden criterion A (β = 0.51, 95 %-CI: 0.47–0.55, $p < .001$) as well as criterion B (β = 0.51, 95 %-CI: 0.47–0.55, $p < .001$). Child abuse explained 15 % of the variance in personality functioning.

Finally, in step three, epistemic trust (ETMCQ total score) was added as an additional mediator for the relationship between child abuse and somatic symptom burden criterion A and B as well as a predictor of personality functioning (see Fig. 4). While epistemic trust was also significantly associated with somatic symptom burden criterion A (β = −0.05, 95 %-CI: −0.09–0.014, $p = .008$) the association with criterion B was not statistically significant (β = −0.04, 95 %-CI: −0.08–0.001, $p = .058$). Also, the overall explained variance did not increase. However, epistemic trust was also significantly associated with personality functioning (β = −0.47, 95 %-CI: −0.50–0.44, $p < .001$) and the explained variance of personality functioning increased from 15 to 36 %.

Since the number of paths resulted in zero degrees of freedom, calculation of fit indices was not possible. To get an estimation of the overall fit of the model, the non-significant paths (childhood abuse ➔ somatic symptom burden criterion A and B) were excluded and the model was run again. After excluding the non-significant paths, the final model showed a good fit ($\chi^2 = 5.188$, $p = .075$; CMIN/DF = 2.594; CFI = 0.99; TLI = 0.99; RMSEA = 0.026, 95 %-CI: 0.000–0.054; PCLOSE = 0.92; Bollen-Stine: $p = .104$). The remaining standardized estimates in the model did not differ with or without the non-significant path. For details, see Fig. 4.

3.4. Sensitivity analysis

For sensitivity analysis, age was added as an additional moderator of somatic symptom burden in the final model. Age was chosen as a moderator because it demonstrated the strongest association among all assessed sociodemographic variables, except for employment status, which was interpreted in this context as a derivative of age. While the regression estimates remained stable, the explained variance for somatic symptom burden criterion A and B increased to 38 % for both variables. Overall, the model fit indices remained good, except for the Bollen-Stine Bootstrap analysis, which no longer indicated a good model fit ($\chi^2 = 11.353$, $p = .010$; CMIN/DF = 3.784; CFI = 0.99; TLI = 0.99; RMSEA = 0.034, 95 %-CI: 0.015–0.056; PCLOSE = 0.88; Bollen-Stine: $p = .009$).

Table 1
Sociodemographic characteristics and proportion of child abuse (ICAST-R) as well as mean values of personality functioning (OPD-SQS) and epistemic stance (ETMCQ) for individuals with and without SSD.

	Total ($N = 2436$)		No SSD ($n = 2270$)		SSD ($n = 166$)				
	N	(%)	*N*	(%)	*N*	(%)	χ^2	*p*	*Φ / V*
sex							3.78	0.15	0.04
male	1173	48.2 %	1105	48.7 %	68	41.0 %			
female	1262	51.8 %	1164	51.3 %	98	59.0 %			
diverse	1	0.0 %	1	0.04 %	0	0.0 %			
age groups							133.09	<0.001	0.25
< 30	445	18.3 %	441	19.4 %	4	2.4 %			
30–39	312	12.8 %	303	13.3 %	9	5.4 %			
40–49	381	15.6 %	367	16.2 %	14	8.4 %			
50–59	499	20.5 %	471	20.7 %	28	16.9 %			
60–9	430	17.7 %	390	17.2 %	40	24.1 %			
>70	369	15.1 %	298	13.1 %	71	42.8 %			
years of education							76.70	<0.001	0.18
< 10 years	752	30.9 %	651	28.7 %	101	60.8 %			
10–13 years	1430	58.7 %	1370	60.4 %	60	36.1 %			
> 13 years	251	10.3 %	246	10.8 %	5	3.0 %			
missing	*3*	*0.1 %*	*3*	*0.1 %*	*0*	*0.0 %*			
relationship							57.61	<0.001	0.15
married	1004	41.2 %	947	41.8 %	57	34.3 %			
single	774	31.8 %	744	32.8 %	30	18.1 %			
divorced	397	16.3 %	362	16.0 %	35	21.1 %			
widowed	258	10.6 %	214	9.4 %	44	26.5 %			
missing	3	0.1 %	3	0.1 %	*0*	*0.0 %*			
with partner							10.72	0.005	0.07
no	1141	46.8 %	1044	46.0 %	97	58.4 %			
yes	1252	51.4 %	1187	52.3 %	65	39.2 %			
missing	*43*	*1.8 %*	*39*	*1.7 %*	*4*	*2.4 %*			
employment status							204.93	<0.001	0.29
full time	1100	45.2 %	1085	47.9 %	15	9.1 %			
part time	341	14.0 %	328	14.5 %	13	7.9 %			
unemployed	166	6.8 %	144	6.4 %	22	13.3 %			
in training	167	6.9 %	167	7.4 %	0	0.0 %			
retired	643	26.4 %	528	23.3 %	115	69.7 %			
missing	*7*	*0.3 %*	*12*	*0.5 %*	*0*	*0.0 %*			
monthly net household income							80.54	<0.001	0.18
<1250 €	302	12.4 %	251	11.1 %	51	30.7 %			
1250–2499 €	980	40.2 %	898	39.6 %	82	49.4 %			
2500–3499 €	537	22.0 %	523	23.0 %	14	8.4 %			
> 3500 €	574	23.6 %	556	24.5 %	18	10.8 %			
missing	*43*	*1.8 %*	*42*	*1.9 %*	*1*	*0.6 %*			
ICAST-R									
any kind of child abuse	809	33.2 %	720	31.7 %	89	53.6 %	33.436	<0.001	0.12
sexual child abuse	230	9.4 %	203	8.9 %	27	16.3 %	9.700	0.002	0.06
physical child abuse	515	21.1 %	448	19.7 %	67	40.4 %	39.473	<0.001	0.13
emotional child abuse	559	22.9 %	489	21.5 %	70	42.2 %	37.222	<0.001	0.12

	M	*(SD)*	*M*	*(SD)*	*M*	*(SD)*	*t*-value	*p*	*g*
age	50.1	(18.0)	49.0	(17.7)	65.0	(15.6)	12.665	<0.001	0.91
OPD-SQS									
total score	9.5	(8.4)	8.8	(7.8)	20.0	(10.2)	13.86	<0.001	1.40
self-perception	1.6	(2.6)	1.3	(2.2)	5.3	(4.1)	12.41	<0.001	1.68
interpersonal contact	3.2	(3.2)	2.9	(3.0)	6.6	(3.7)	12.83	<0.001	1.21
relationship model	4.8	(3.9)	4.6	(3.7)	8.0	(4.1)	11.25	<0.001	0.91
ETMCQ									
total score	58.7	(10.2)	59.2	(10.1)	51.7	(9.5)	9.29	<0.001	0.75
trust	23.7	(5.7)	23.8	(5.7)	22.5	(6.1)	2.86	0.004	0.23
mistrust	11.0	(4.9)	10.8	(4.8)	14.4	(5.5)	8.22	<0.001	0.74
credulity	9.8	(3.7)	9.7	(3.7)	12.3	(3.6)	8.86	<0.001	0.70

Note: SSD = Somatic Symptom Disorder according to the combined use of the Somatic Symptom Scale-8 (SSS-8) and the SSD B Criteria Scale 12 (SSD-12) as well as symptoms persisting for at least six months; ICAST-R = ISPAN Child Abuse Screening Tools-Retrospective; OPD-SQS = Operationalized Psychodynamic Diagnosis Structure Questionnaire-Short Form; ETMCQ = Epistemic Trust, Mistrust and Credulity Questionnaire.

For details, see efigure 1 and 2 in supplementary materials.

To address potential bias from data imputation, the models were also calculated using unimputed data. However, no notable differences were observed compared to the models with imputed data. For details, see eFigures 3–5 in the supplementary materials.

4. Discussion

Based on data of a representative survey of the German population, we examined the association between child abuse, epistemic trust, and personality functioning with somatic symptom burden and SSD in a cross-sectional study design.

Based on self-report and additionally considering symptom duration

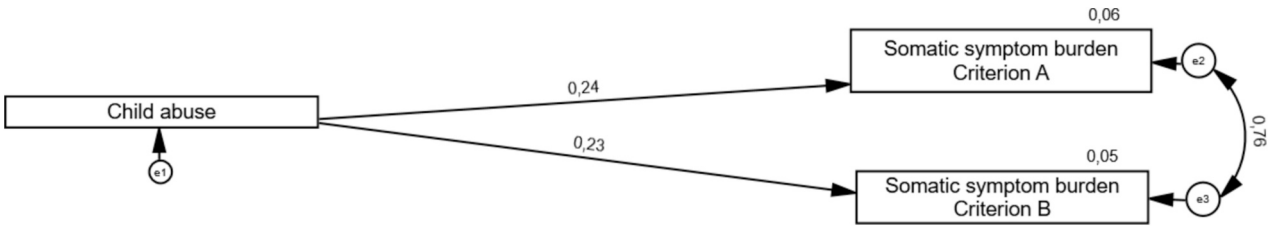

Fig. 2. Structural equation model step 1 – Direct association between child abuse (ICAST-R) and somatic symptom burden criterion A (sum score of the SSS-8) and somatic symptom burden criterion B (sum score of the SSD-12).
Note: Rectangles represent variables and circles represent error terms (e). Numbers next to arrows in the model represent standardized estimates, numbers next to factors represent the R^2, i.e. the explained variance.

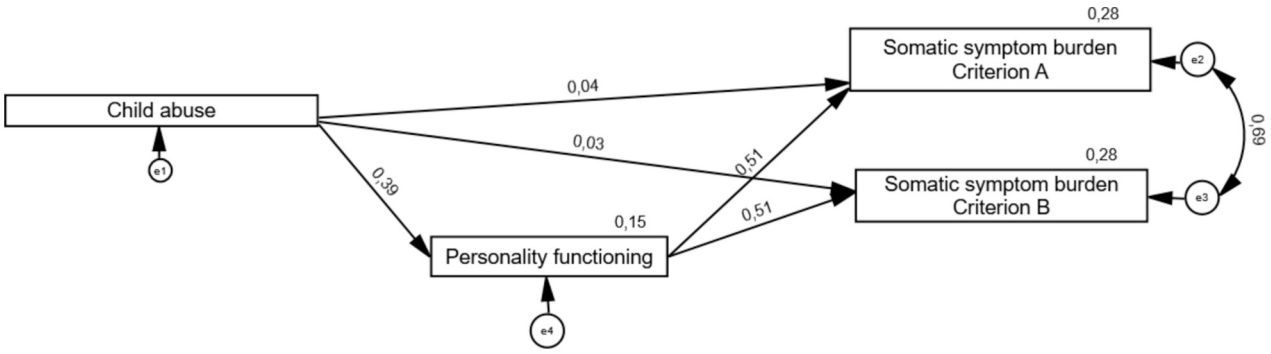

Fig. 3. Structural equation model step 2 – Mediating effect of personality functioning (OPD-SQS sum score) on the association between child abuse (ICAST-R) and somatic symptom burden criterion A (sum score of the SSS-8) and somatic symptom burden criterion B (sum score of the SSD-12).
Note: Rectangles represent variables and circles represent error terms (e). Numbers next to arrows in the model represent standardized estimates, numbers next to factors represent the R^2, i.e. the explained variance.

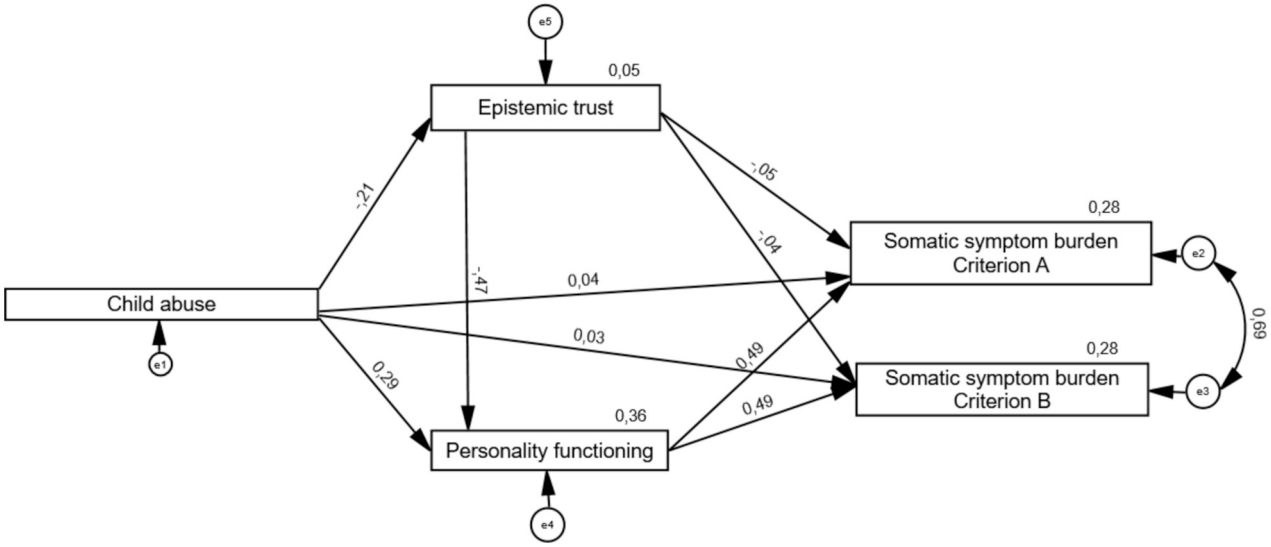

Fig. 4. Structural equation model step 3 – Mediating effect of personality functioning (OPD-SQS sum score) and epistemic trust (ETMCQ sum score) on the association between child abuse (ICAST-R) and somatic symptom burden criterion A (sum score of the SSS-8) and somatic symptom burden criterion B (sum score of the SSD-12) with personality functioning as mediator for the association between child abuse and somatic symptom burden criterion A and B and epistemic trust as a predictor of personality functioning.
Note: Rectangles represent variables and circles represent error terms (e). Numbers next to arrows in the model represent standardized estimates, numbers next to factors represent the R^2, i.e. the explained variance.

(criterion C), 6.8 % (7.6 % when omitting criterion C) of the general population fulfilled the criteria for SSD. This aligns with a recent systematic review reporting frequency rates between 6.7 and 17.4 % for the general population (Löwe et al., 2022) or an assessment of patients in general practice reporting that about 8 % fulfil the criteria of SSD (Lehmann et al., 2022). While about one third of participants reported at least one form of child abuse, rates were significantly higher in participants with SSD (53.6 % vs. 31.7 %), with rates for emotional abuse being the highest, followed by physical and sexual abuse. Overall, our data indicate that experiences of child abuse were associated with a 2.5

times increased likelihood of SSD. Moreover we found a direct association between child abuse and somatic symptom burden, highlighting the importance of having suffered from child abuse for the development of SSD. To our knowledge, this is the first study addressing child abuse in SSD. Concordantly with other investigations on somatization and somatoform disorder (Pinto et al., 2023; Piontek et al., 2021; Spitzer et al., 2008), our results demonstrated that a history of child abuse may pose a prominent risk factor for SSD as well.

In line with our hypothesis, participants with SSD not only showed more strongly impaired personality functioning than those without SSD, but impaired personality functioning was also directly associated with somatic symptom burden and child abuse. Moreover, our results indicate that personality functioning mediates the association between child abuse and somatic symptom burden, explaining 31 % of its variance. Respective research in SSD is still scarce but first studies suggest e.g., impairments in personality functioning to mediate the association between ACEs and somatization (Kerber et al., 2023). The potential of considering personality functioning in SSD becomes even more evident given the advantages of the new criteria compared to former diagnoses like somatoform disorder. The new B criterion allows for a focus on psychological maladaptive processes within one's personality functioning (Macina et al., 2021). Persons who have experienced ACEs often show impaired identity perception, altered affect regulation, or interpersonal difficulties (Cloitre et al., 2019). These disturbances in self-organization (DSO) may also foster somatic symptom maintenance or exacerbation more generally (Kuhar and Zager Kocjan, 2022). This corresponds to a recent systematic review on SSD and somatization also concluding that the self-domain – corresponding closely to overall personality functioning (Kerr et al., 2023) – plays an important part in SSD (Macina et al., 2021). Studies demonstrated that patients with SSD have more difficulties in identifying, describing and regulating their feelings than healthy controls (Erkic et al., 2018; Schnabel et al., 2022). A recent study by Berens and colleagues highlighted the effect of greater impairments in both personality functioning and mentalizing in patients with chronic gastrointestinal complaints and SSD compared to patients without SSD. They argue that general difficulties in personal functioning as well as mentalizing (specifically problems in attributing and interpreting feelings) are associated with a greater psychological burden due to somatic symptoms. Thereby, the inability to understand oneself and others as well as impaired self-regulation – both basic psychological capacities – might contribute to the development and maintenance of SSD (Berens et al., 2021). Even though more specific knowledge regarding participants' mentalizing capacities is necessary to fully support this line of thinking, our results suggest that impaired personality functioning might be crucial to consider in patients with SSD.

As a novel approach, we also modeled the role of epistemic trust and social learning in our model. For one, disruptions in epistemic trust – namely elevated mistrust and credulity as well as reduced trust – were significantly higher in participants with SSD compared to those without SSD. This corresponds to previous evidence suggesting that patients with SSD might not only show a higher sensitivity for negative emotions, they also exhibit less trust in others (Erkic et al., 2018). Youth with SSD also showed a lack of trust in their treating physicians (Barak et al., 2023), which might pose a severe barrier to the treatment effectiveness. Still, in our model, the hypothesis that epistemic trust operates as a mediator did not receive support. Despite a significant association between epistemic trust and somatic symptom burden, the explained variance did not increase when adding epistemic trust as a mediator alongside personality functioning. However, consistent with a previous study on (complex) PTSD – a diagnosis strongly associated with prolonged, repeated or multiple traumatic stressors such as ACEs (Cloitre, 2020) – epistemic trust predicted personality functioning (Kampling et al., 2022). Hence, participants who trust less and mistrust more may be more likely to experience impaired personality functioning, pointing towards the transdiagnostic role of epistemic trust. This is an important finding regarding treatment success of patients with high somatic symptom burden and SSD, as especially psychotherapy requires an openness for social learning within the therapeutic relationship (Nolte et al., 2023), and thereby, epistemic trust. However, patients with SSD often suffer from a long history of ultimately unsuccessful treatments, leaving them frustrated, and in turn, perceived as difficult to treat by health care professionals (Henningsen, 2018) – a cycle of repeated experiences of stigmatization and further epistemic disruption. Given that health care professionals serve as the knowledge providers, a patient's epistemic stance shapes the reception of information provided by those in their professional helping network regarding disease and treatment (Riedl et al., 2023a). Certain aspects generally effectively treatable through psychotherapy like e.g. emotional awareness or emotion regulation (Saccaro et al., 2024) might become more challenging for patients that might exhibit an inherent trauma-related disturbance in epistemic trust and openness to social learning. Therefore, the significance of epistemic trust in the context of the health care system in general is particularly evident. Regarding psychosomatic rehabilitation, preliminary findings highlighted improvements in epistemic mistrust as key component in increasing mentalizing capacities (Riedl et al., 2023b). Moreover, an overall beneficial psychosomatic rehabilitation outcome (in terms of symptom reduction) was accompanied by increasing epistemic trust, while conversely, a negative outcome was associated with increasing epistemic mistrust and epistemic credulity (Riedl et al., 2023b). For patients with complex PTSD, improvements in epistemic trust were identified as a potential mechanism of substantial beneficial changes in trauma-related symptoms as well as somatization symptoms (Lampe et al., 2024). While these findings indicate the importance of epistemic trust as an underlying mechanism of psychopathology, future research has yet to establish it as a transdiagnostic factor.

5. Conclusion

In conclusion, this study is the first to examine the association between child abuse, personality functioning and epistemic trust with SSD and somatic symptom burden. We demonstrate that participants with SSD are highly burdened in terms of elevated frequency rates of emotional, physical and sexual abuse as well as impaired personality functioning and disruptions in epistemic trust. Impairments in personality functioning and disruptions in epistemic trust might play an important role in experiencing symptoms of SSD. This knowledge may contribute to better understanding the underlying pathways and transdiagnostic factors involved in psychopathology following child abuse. While the knowledge about the detrimental and far-reaching effects of child abuse poses a chance for increased prevention strategies, the issue of reduced epistemic trust alongside impaired personality functioning gives insight into new treatment angles for patients with SSD that future research and clinicians should consider.

5.1. Strength and limitations

The strengths of this study are the large representative data the analyses are based on. To our knowledge, the present one is one of the few studies not only assessing criterion A and B but also taking symptom duration (criterion C) into account, allowing for a more precise and comprehensive SSD diagnosis, although results rely on self-report and are not corroborated by clinicians' diagnosis. Employing the transdiagnostic concepts of personality functioning and epistemic trust in our analyses generates a perspective for understanding the pathways underlying the association between child abuse and SSD and their impact on help-seeking and therapeutic relationships. However, potential limitations should be considered when interpreting the study results. The study and its hypothesis were added post-hoc and have not been preregistered. The cross-sectional design does not allow for any conclusions regarding causality. Moreover, the interpretation of the results should consider the potential impact of other confounders and be considered in future research. In addition, all data were assessed via self-report

measures and the retrospective assessment of child abuse may be subject to recall bias. However, concerning child abuse, studies have shown retrospective assessment to be sufficiently accurate compared to prospectively assessed child abuse, underscoring the validity of self-report measures and especially the ICAST-R to assess child abuse (Meinck et al., 2023; Scott et al., 2012).

CRediT authorship contribution statement

Hanna Kampling: Writing – review & editing, Writing – original draft, Investigation, Conceptualization. **David Riedl:** Writing – review & editing, Writing – original draft, Methodology, Formal analysis, Conceptualization. **Astrid Lampe:** Writing – review & editing, Supervision, Conceptualization. **Tobias Nolte:** Writing – review & editing, Conceptualization. **Elmar Brähler:** Writing – review & editing, Data curation. **Mareike Ernst:** Writing – review & editing. **Jörg M. Fegert:** Writing – review & editing, Data curation. **Tobias Geisel:** Writing – review & editing. **Nora Hettich-Damm:** Writing – review & editing. **Andreas Jud:** Writing – review & editing, Data curation. **Sandra Zara:** Writing – review & editing. **Johannes Kruse:** Writing – review & editing, Supervision, Data curation, Conceptualization.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors. The necessary funding for the survey conducted by the USUMA GmbH come from internal budget.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgements

We thank the staff of the USUMA GmbH involved in data retrieval and management as well as all participants who took the time to partake in our study.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jad.2024.12.096.

Data availability

Written informed consent from the study participants of the representative surveys conducted by the USUMA GmbH does not allow public access to the data. Access to the local database of the representative survey is possible at any time upon reasonable request according to the ethics vote. This is in line with the local ethics concept approved by the local ethics committee of the Medical Faculty of the University of Leipzig, Germany. Interested scientists can make their request to the corresponding author of this study.

References

Atkinson, L., Joshi, D., Raina, P., Griffith, L.E., MacMillan, H., Gonzalez, A., 2023. Social engagement and allostatic load mediate between adverse childhood experiences and multimorbidity in mid to late adulthood: the Canadian longitudinal study on aging. Psychol. Med. 53, 1437–1447. https://doi.org/10.1017/S0033291721003019.

Barak, S., Landa, J., Gerner, M., Eisenstein, E., Arzoni Bardach, C., Silberg, T., 2023. A behavioral characteristics observational measure of youth with somatic symptom disorder during physical rehabilitation. Life (Basel) 13, 2078. https://doi.org/10.3390/life13102078.

Bateman, A., 2023. Mentalization Based Treatment – Trauma Focused (MBT-TF): Rationale of a Mentalizing Model for Treatment of People Who Have Experienced Developmental Trauma.

Beebe, B., Jaffe, J., Markese, S., Buck, K., Chen, H., Cohen, P., Bahrick, L., Andrews, H., Feldstein, S., 2010. The origins of 12-month attachment: a microanalysis of 4-month mother-infant interaction. Attach Hum. Dev. 12, 3–141. https://doi.org/10.1080/14616730903338985.

Berens, S., Schaefert, R., Ehrenthal, J.C., Baumeister, D., Gauss, A., Eich, W., Tesarz, J., 2021. The validity of somatic symptom disorder in patients with gastrointestinal complaints. J. Clin. Gastroenterol. 55, e66–e76. https://doi.org/10.1097/MCG.0000000000001505.

Beutel, M.E., Tibubos, A.N., Klein, E.M., Schmutzer, G., Reiner, I., Kocalevent, R.-D., Brähler, E., 2017. Childhood adversities and distress - the role of resilience in a representative sample. PLoS One 12, e0173826. https://doi.org/10.1371/journal.pone.0173826.

Bo, S., Sharp, C., Fonagy, P., Kongerslev, M., 2017. Hypermentalizing, attachment, and epistemic trust in adolescent BPD: clinical illustrations. Personal. Disord. Theory Res. Treat. 8, 172–182. https://doi.org/10.1037/per0000161.

Bollen, K.A., Stine, R.A., 1992. Bootstrapping goodness-of-fit measures in structural equation models. Sociol. Methods Res. 21, 205–229. https://doi.org/10.1177/0049124192021002004.

Campbell, C., Tanzer, M., Saunders, R., Booker, T., Allison, E., Li, E., O'Dowda, C., Luyten, P., Fonagy, P., 2021. Development and validation of a self-report measure of epistemic trust. PLoS One 16, e0250264. https://doi.org/10.1371/journal.pone.0250264.

Cloitre, M., 2020. ICD-11 complex post-traumatic stress disorder: simplifying diagnosis in trauma populations. Br. J. Psychiatry 216, 129–131. https://doi.org/10.1192/bjp.2020.43.

Cloitre, M., Khan, C., Mackintosh, M.-A., Garvert, D.W., Henn-Haase, C.M., Falvey, E.C., Saito, J., 2019. Emotion regulation mediates the relationship between ACES and physical and mental health. Psychol. Trauma Theory Res. Pract. Policy 11, 82–89. https://doi.org/10.1037/tra0000374.

Dunne, M.P., Zolotor, A.J., Runyan, D.K., Andreva-Miller, I., Choo, W.Y., Dunne, S.K., Gerbaka, B., Isaeva, O., Jain, D., Kasim, M.S., Macfarlane, B., Mamyrova, N., Ramirez, C., Volkova, E., Youssef, R., 2009. ISPCAN child abuse screening tools retrospective version (ICAST-R): Delphi study and field testing in seven countries. Child Abuse Negl. 33, 815–825. https://doi.org/10.1016/j.chiabu.2009.09.005.

Dunphy, L., Penna, M., El-Kafsi, J., 2019. Somatic symptom disorder: a diagnostic dilemma. BMJ Case Rep. 12, e231550. https://doi.org/10.1136/bcr-2019-231550.

Ehrenthal, Dinger, Schauenburg, Horsch, Dahlbender, Gierk, 2015. Entwicklung einer zwölf-item-version des OPD-Strukturfragebogens (OPD-SFK)/development of a 12-item version of the OPD-structure questionnaire (OPD-SQS). Z. Psychosom. Med. Psychother. 61, 262–274.

Ehrenthal, J., Kruse, J., Schmalbach, B., Dinger, U., Werner, S., Schauenburg, H., Brähler, E., Kampling, H., 2023. Measuring personality functioning with the 12-item version of the OPD-structure questionnaire (OPD-SQS): reliability, factor structure, validity, and measurement invariance in the general population. Front. Psychol. 14, 1248992.

Ehrenthal, J.C., Benecke, C., 2019. Tailored treatment planning for individuals with personality disorders. In: Case formulation for personality disorders. Elsevier, pp. 291–314. https://doi.org/10.1016/B978-0-12-813521-1.00015-1.

Eilers, H., Aan Het Rot, M., Jeronimus, B.F., 2023. Childhood trauma and adult somatic symptoms. Psychosom. Med. 85, 408–416. https://doi.org/10.1097/PSY.0000000000001208.

Erkic, M., Bailer, J., Fenske, S.C., Schmidt, S.N.L., Trojan, J., Schröder, A., Kirsch, P., Mier, D., 2018. Impaired emotion processing and a reduction in trust in patients with somatic symptom disorder. Clin. Psychol. Psychother. 25, 163–172. https://doi.org/10.1002/cpp.2151.

Ernst, M., Brähler, E., Kampling, H., Kruse, J., Fegert, J.M., Plener, P.L., Beutel, M.E., 2022. Is the end in the beginning? Child maltreatment increases the risk of non-suicidal self-injury and suicide attempts through impaired personality functioning. Child Abuse Negl. 133, 105870. https://doi.org/10.1016/j.chiabu.2022.105870.

Fonagy, P., Allison, E., 2014. The role of mentalizing and epistemic trust in the therapeutic relationship. Psychotherapy 51, 372–380. https://doi.org/10.1037/a0036505.

Fonagy, P., Allison, E., 2023. Beyond Mentalizing: epistemic trust and the transmission of culture. Psychoanal. Q. 92, 599–640. https://doi.org/10.1080/00332828.2023.2290023.

Fonagy, P., Campbell, C., 2017. Mentalizing, attachment and epistemic trust: how psychotherapy can promote resilience. Psychiatr. Hung. 32, 283–287.

Fonagy, P., Gergely, G., Jurist, E.L., 2019. Affect Regulation. Routledge, London, Mentalization and the Development of the Self. https://doi.org/10.4324/9780429471643.

Fonagy, P., Luyten, P., Allison, E., Campbell, C., 2017. What we have changed our minds about: part 2. Borderline personality disorder, epistemic trust and the developmental significance of social communication. bord personal disord emot dysregul 4, 9. https://doi.org/10.1186/s40479-017-0062-8.

Freier, A., Kruse, J., Schmalbach, B., Zara, S., Werner, S., Brähler, E., Fegert, J.M., Kampling, H., 2022a. The mediation effect of personality functioning between different types of child maltreatment and the development of depression/anxiety symptoms – a German representative study. J. Affect. Disord. 299, 408–415. https://doi.org/10.1016/j.jad.2021.12.020.

Freier, A., Kruse, J., Schmalbach, B., Zara, S., Werner, S., Brähler, E., Fegert, J.M., Kampling, H., 2022b. Supplementary data for the mediation effect of personality functioning - gender differences, separate analyses of depression and anxiety symptoms and inferential statistics of the relationship between personality

functioning and different types of child maltreatment. Data Brief 42, 108272. https://doi.org/10.1016/j.dib.2022.108272.
Gierk, B., Kohlmann, S., Kroenke, K., Spangenberg, L., Zenger, M., Brähler, E., Löwe, B., 2014. The somatic symptom scale–8 (SSS-8): a brief measure of somatic symptom burden. JAMA Intern. Med. 174, 399. https://doi.org/10.1001/jamainternmed.2013.12179.
Henningsen, P., 2018. Management of somatic symptom disorder. Dialogues Clin. Neurosci. 20, 23–31.
Hüsing, P., Löwe, B., Toussaint, A., 2018. Comparing the diagnostic concepts of ICD-10 somatoform disorders and DSM-5 somatic symptom disorders in patients from a psychosomatic outpatient clinic. J. Psychosom. Res. 113, 74–80. https://doi.org/10.1016/j.jpsychores.2018.08.001.
Jarczok, M., Lange, S., Meinck, F., Witt, A., Clemens, V., Fegert, J.M., Jud, A., 2023. Widening epidemiological data on the prevalence of child maltreatment: validation of the German ICAST-R in a student sample and national household survey. Child Abuse Negl. 137, 106038. https://doi.org/10.1016/j.chiabu.2023.106038.
Kampling, H., Kruse, J., Lampe, A., Nolte, T., Hettich, N., Brähler, E., Sachser, C., Fegert, J.M., Gingelmaier, S., Fonagy, P., Krakau, L., Zara, S., Riedl, D., 2022. Epistemic trust and personality functioning mediate the association between adverse childhood experiences and posttraumatic stress disorder and complex posttraumatic stress disorder in adulthood. Front. Psychol. 13, 919191. https://doi.org/10.3389/fpsyt.2022.919191.
Kerber, A., Gewehr, E., Zimmermann, J., Sachser, C., M. Fegert, J., Knaevelsrud, C., Spitzer, C., 2023. Adverse childhood experiences and personality functioning interact substantially in predicting depression, anxiety, and somatization. Personal. Ment. Health 17, 246–258. https://doi.org/10.1002/pmh.1578.
Kernberg, O.F., 1993. Severe Personality Disorders: Psychotherapeutic Strategies, Rev ed Edition. ed. Yale University Press, New Haven.
Kerr, S., McLaren, V., Cano, K., Vanwoerden, S., Goth, K., Sharp, C., 2023. Levels of personality functioning questionnaire 12–18 (LoPF-Q 12–18): factor structure, validity, and clinical cut-offs. Assessment 30, 1764–1776. https://doi.org/10.1177/10731911221124340.
Kish, L., 1949. A procedure for objective respondent selection within the household. J. Am. Stat. Assoc. 44, 380–387. https://doi.org/10.1080/01621459.1949.10483314.
Krakau, L., Tibubos, A.N., Beutel, M.E., Ehrenthal, J.C., Gieler, U., Brähler, E., 2021. Personality functioning as a mediator of adult mental health following child maltreatment. J. Affect. Disord. 291, 126–134. https://doi.org/10.1016/j.jad.2021.05.006.
Kroenke, K., Spitzer, R.L., Williams, J.B.W., 2002. The PHQ-15: validity of a new measure for evaluating the severity of somatic symptoms. Psychosom. Med. 64, 258–266. https://doi.org/10.1097/00006842-200203000-00008.
Kuhar, M., Zager Kocjan, G., 2022. Adverse childhood experiences and somatic symptoms in adulthood: a moderated mediation effects of disturbed self-organization and resilient coping. Psychol. Trauma 14, 1288–1298. https://doi.org/10.1037/tra0001040.
Kurlansik, S.L., Maffei, M.S., 2016. Somatic symptom disorder. Am. Fam. Physician 93, 49–54.
Lampe, A., Riedl, D., Kampling, H., Nolte, T., Kirchhoff, C., Grote, V., Fischer, M., Kruse, J., 2024. Improvements of complex posttraumatic stress disorder (CPTSD) symptoms during a multimodal psychodynamic inpatient rehabilitation treatment – results of an observational single center pilot study. Eur. J. Psychotraumatol. https://doi.org/10.1080/20008066.2024.2333221.
Lehmann, M., Jonas, C., Pohontsch, N.J., Zimmermann, T., Scherer, M., Löwe, B., 2019. General practitioners' views on the diagnostic innovations in DSM-5 somatic symptom disorder - a focus group study. J. Psychosom. Res. 123, 109734. https://doi.org/10.1016/j.jpsychores.2019.109734.
Lehmann, M., Pohontsch, N.J., Zimmermann, T., Scherer, M., Löwe, B., 2022. Estimated frequency of somatic symptom disorder in general practice: cross-sectional survey with general practitioners. BMC Psychiatry 22, 632. https://doi.org/10.1186/s12888-022-04100-0.
Little, R.J.A., 1988. A test of missing completely at random for multivariate data with missing values. J. Am. Stat. Assoc. 83, 1198–1202. https://doi.org/10.1080/01621459.1988.10478722.
Löwe, B., Levenson, J., Depping, M., Hüsing, P., Kohlmann, S., Lehmann, M., Shedden-Mora, M., Toussaint, A., Uhlenbusch, N., Weigel, A., 2022. Somatic symptom disorder: a scoping review on the empirical evidence of a new diagnosis. Psychol. Med. 52, 632–648. https://doi.org/10.1017/S0033291721004177.
Macina, C., Bendel, R., Walter, M., Wrege, J.S., 2021. Somatization and somatic symptom disorder and its overlap with dimensionally measured personality pathology: a systematic review. J. Psychosom. Res. 151, 110646. https://doi.org/10.1016/j.jpsychores.2021.110646.
Meinck, F., Neelakantan, L., Steele, B., Jochim, J., Davies, L.M., Boyes, M., Barlow, J., Dunne, M., 2023. Measuring violence against children: a COSMIN systematic review of the psychometric properties of child and adolescent self-report measures. Trauma Violence Abuse 24, 1832–1847. https://doi.org/10.1177/15248380221082152.
Nolte, T., Under review. Epistemic trust, Mistrust and Credulity Questionnaire (ETMCQ).
Nolte, T., Hutsebaut, J., Sharp, C., Campbell, C., Fonagy, P., Bateman, A., 2023. The role of epistemic trust in mentalization-based treatment of borderline psychopathology. J. Personal. Disord. 37 (5), 633–659. https://doi.org/10.1521/pedi.2023.37.5.633.
Pinto, R.J., Vieira de Castro, M., Correia-Santos, P., Jongenelen, I., Maia, Â.C., Levendosky, A., 2023. The mediating role of posttraumatic stress symptoms on somatization in adolescents: a two-wave longitudinal study. Psychol. Trauma 15, S47–S54. https://doi.org/10.1037/tra0001331.
Piontek, K., Wiesmann, U., Apfelbacher, C., Völzke, H., Grabe, H.J., 2021. The association of childhood maltreatment, somatization and health-related quality of life in adult age: results from a population-based cohort study. Child Abuse Negl. 120, 105226. https://doi.org/10.1016/j.chiabu.2021.105226.
Riedl, D., Kampling, H., Kruse, J., Nolte, T., Labek, K., Kirchhoff, C., Grote, V., Fischer, M.J., Knipel, A., Lampe, A., 2023a. Epistemic trust is a critical success factor in psychosomatic rehabilitation-results from a naturalistic multi-center observational study. J. Clin. Med. 13, 177. https://doi.org/10.3390/jcm13010177.
Riedl, D., Kampling, H., Nolte, T., Lampe, A., Beutel, M.E., Brähler, E., Kruse, J., 2022. Measuring impairments of Mentalization with the 15-item Mentalization questionnaire (MZQ) and introducing the MZQ-6 short scale: reliability, validity and norm values based on a representative sample of the German population. Diagnostics (Basel) 13, 135. https://doi.org/10.3390/diagnostics13010135.
Riedl, D., Rothmund, M.S., Grote, V., Fischer, M.J., Kampling, H., Kruse, J., Nolte, T., Labek, K., Lampe, A., 2023b. Mentalizing and epistemic trust as critical success factors in psychosomatic rehabilitation: results of a single center longitudinal observational study. Front. Psychol. 14, 1150422. https://doi.org/10.3389/fpsyt.2023.1150422.
Saccaro, L.F., Giff, A., De Rossi, M.M., Piguet, C., 2024. Interventions targeting emotion regulation: a systematic umbrella review. J. Psychiatr. Res. 174, 263–274. https://doi.org/10.1016/j.jpsychires.2024.04.025.
Schnabel, K., Schulz, S.M., Witthöft, M., 2022. Emotional reactivity, emotion regulation, and regulatory choice in somatic symptom disorder. Psychosom Med Publish Ahead of Print. https://doi.org/10.1097/PSY.0000000000001118.
Scott, K.M., McLaughlin, K.A., Smith, D.A.R., Ellis, P.M., 2012. Childhood maltreatment and DSM-IV adult mental disorders: comparison of prospective and retrospective findings. Br. J. Psychiatry 200, 469–475. https://doi.org/10.1192/bjp.bp.111.103267.
Spitzer, C., Barnow, S., Gau, K., Freyberger, H.J., Grabe, H.J., 2008. Childhood maltreatment in patients with somatization disorder. Aust. N. Z. J. Psychiatry 42, 335–341. https://doi.org/10.1080/00048670701881538.
Toussaint, A., Hüsing, P., Kohlmann, S., Löwe, B., 2019. Detecting DSM-5 somatic symptom disorder: criterion validity of the patient health Questionnaire-15 (PHQ-15) and the somatic symptom Scale-8 (SSS-8) in combination with the somatic symptom disorder – B criteria scale (SSD-12). Psychol. Med. 50, 324–333. https://doi.org/10.1017/S003329171900014X.
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). Psychosom. Med. 78, 5–12. https://doi.org/10.1097/PSY.0000000000000240.
Wagner-Skacel, J., Riedl, D., Kampling, H., Lampe, A., 2022. Mentalization and dissociation after adverse childhood experiences. Sci. Rep. 12, 6809. https://doi.org/10.1038/s41598-022-10787-8.
Wu, C.-S., Chen, T.-T., Liao, S.-C., Huang, W.-C., Huang, W.-L., 2023. Clinical outcomes, medical costs, and medication usage patterns of different somatic symptom disorders and functional somatic syndromes: a population-based study in Taiwan. Psychol. Med. 1–9. https://doi.org/10.1017/S0033291723003355.