

Justus-Liebig-Universität Gießen

Fachbereich Medizin

Klinik für Psychosomatik und Psychotherapie

**GESUNDHEITLICHE FOLGEN BELASTENDER
KINDHEITSERFAHRUNGEN BESSER VERSTEHEN:
DIE ROLLE DER PERSÖNLICHKEITSFUNKTIONEN**

Kumulative Habilitationsschrift

zur Erlangung der Lehrbefähigung für das Fach Psychosomatik
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VERZEICHNIS DER WISSENSCHAFTLICHEN PUBLIKATIONEN ZUR KUMULATIVEN HABILITATION

Verweise auf wissenschaftliche Arbeiten im Text, die die publikationsbasierte Habilitation konstituieren, sind jeweils durch Fettdruck und ein hochgestelltes Doppelkreuz (#) hinter der Jahreszahl gekennzeichnet

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Geteilte Erst- oder Letztautorenschaften sind durch ein (+) hinter dem Namen gekennzeichnet.

Nr.	Originalarbeit	Kapitel
(1)	Ehrenthal JC, 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. <i>Front Psychol</i> , 14:1248992. DOI: 10.3389/fpsyg.2023.1248992	4.1
(2)	Riedl D ⁺ & Kampling H ⁺ , Nolte T, Lampe A, Beutel ME, Brähler E, & Kruse J (2023). 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. <i>Diagnostics</i> 13(1), 135. DOI: 10.3390/diagnostics13010135	4.2
(3)	Freier A, Kruse J, Schmalbach B, Zara S, Werner S, Brähler E, Fegert JM, & Kampling H (2022). The Mediation Effect of Personality Functioning Between Different Types of Child Maltreatment and the Development of Depression/Anxiety Symptoms – a German Representative Study. <i>J Affect Disord</i> , 299, 408-15. DOI: 10.1016/j.jad.2021.12.020	4.3
(4)	Ernst M, Brähler E, Kampling H , Kruse J, & Beutel M (2022). Is the end in the beginning? Childhood adversity increases the risk of non-suicidal self-injury and suicide attempts in adulthood through impaired personality functioning. <i>Child Abuse Negl</i> 133:105870. DOI: 10.1016/j.chiabu.2022.105870	4.4
(5)	Wagner-Skacel J, Riedl D, Kampling H , Lampe A (2022). Mentalization and dissociation after adverse childhood experiences. <i>Sci Rep</i> , 12(1), 6809. DOI: 10.1038/s41598-022-10787-8.	4.5

- (6) **Kampling H**, Kruse J, Lampe A, Nolte T, Hettich N, Brähler E, Sachser C, Fegert JM, Gengelmaier S, Fonagy P, Krakau L, Zara S and 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. Psychiatry* 13:919191. DOI: 10.3389/fpsyt.2022.919191

4.6
 - (7) Riedl D, Rothmund M, Grote V, Fischer MJ, **Kampling H**, Kruse J, Nolte T, Labek K., & Lampe A (2023). Mentalizing and epistemic trust as critical success factors in psychosomatic rehabilitation – Results of a single center longitudinal observational study. *Frontiers Psychiatry* 14:1150422. DOI: 10.3389/fpsyt.2023.1150422

4.7
 - (8) Zara S, Brähler E, Sachser C, Fegert JM, Häuser W, Krakau L, & **Kampling H⁺** & Kruse J⁺ (2023). Associations of different types of child maltreatment and diabetes in adulthood – the mediating effect of personality functioning: Findings from a population-based representative German sample. *Ann Epidemiol* 78, 47-53. DOI: 10.1016/j.annepidem.2022.12.004

4.8
 - (9) **Kampling H⁺**, Köhler B⁺, Germerott I, Haastert B, Icks A, Kulzer B, Nowotny B, Hermanns N, & Kruse J (2022). An Integrated Psychosomatic Treatment Program for People with Diabetes (psy-PAD): Results of a Randomized Controlled Trial. *Dtsch Arztebl Int*, 119, 245-252. DOI: 10.3238/arztebl.m2022.0094

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1. EINFÜHRUNG

Psychopathologische Phänomene und deren Entstehung sowie deren enge Zusammenhänge mit einer Vielzahl von chronischen körperlichen Erkrankungen sind noch immer nicht vollständig verstanden. In den letzten Dekaden stellte sich damit zunehmend die Frage, ob sich für deren Pathogenese zugrundeliegende Pfade und Mechanismen identifizieren lassen, um die Entstehung von Krankheitsbildern besser zu verstehen, diese präventiv und therapeutisch nutzbar zu machen sowie damit letztlich neue Ansatzpunkte für evidenzbasierte Behandlungen zu identifizieren und die Versorgungsstrukturen zu verbessern.

Als theoretischer Rahmen zur Entstehung und Aufrechterhaltung von Krankheit hat sich das erweiterte *biopsychosoziale Modell* inzwischen fest etabliert, welche als beteiligte Wirkfaktoren *biologische*, *psychologische* und *soziale Phänomene* benennt und gleichzeitig die lange bestehende Dichotomisierung zwischen biologisch und psychologisch (Leib-Seele-Dilemma) aufzuheben versucht (siehe Abbildung 1) (Egger, 2005, 2015).

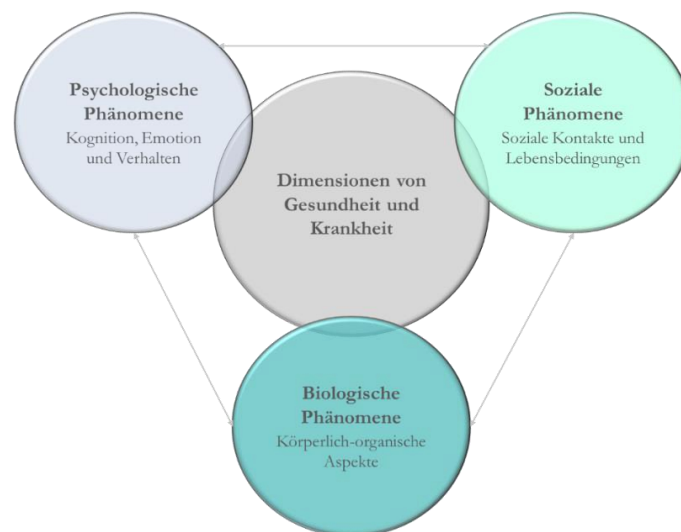


Abbildung 1: Biopsychosoziales Modell adaptiert nach Engel 1977 aus (Burch, 2021)

Forschungspraktisch werden die biologischen, psychologischen und sozialen Phänomene in der Regel mit einer eigenen Methodik erfasst und die Beziehungen und Interaktionen dieser Phänomene zueinander in Bezug gesetzt. Auch wenn die Beteiligung genetischer und neuroinflammatorischer Marker an der Entstehung psychischer Störungen immer wieder diskutiert wird (Costello et al., 2019; Smoller, 2016; Troubat et al., 2021), sind die *biologischen* Grundlagen weiterhin Gegenstand intensiver Forschung. Zahlreiche Forschungsergebnisse weisen jedoch darauf hin, dass verschiedene biologisch vermittelte bidirektionale Zusammenhänge zwischen einer Vielzahl chronischer körperlicher Erkrankungen und psychischen Störungen zu bestehen scheinen, sodass diese auch zukünftig Gegenstand des wissenschaftlichen Interesses bleiben wird (Craven & Bland, 2013; Jeppesen & Benros, 2019; Jones et al., 2021; Kvaalem et al., 2020; Voinov et al., 2013).

Hinsichtlich der *psychologischen Phänomene* und der Entstehung psychischer Störungen finden sich eine Vielzahl theoretischer und empirisch belegter Vorstellungen und Modelle. Während hier Studien u. a. aus den Bereichen der Verhaltenstherapie oder systemischen Therapie einen signifikanten Beitrag zur Forschungslandschaft liefern, kommt insbesondere den entwicklungspsychologischen und bindungstheoretischen Ansätzen eine tragende Rolle zu. Die psychodynamische orientierte Forschung blickt auf eine lange Tradition von Theorien und Konstrukten zu Psychopathologien und ätiologischen Zusammenhängen. Eine der Kernannahmen der Psychodynamik postuliert, dass frühe Erfahrungen in der Kindheit durch das Formen basaler mentaler Fertigkeiten und adaptiver Bewältigungsmechanismen essentiell für die Entwicklung zugrundeliegender Persönlichkeitsfunktionen (siehe hierzu auch 1.3) sind (Beebe et al., 2010; Kernberg, 1993). Grundvoraussetzungen für eine gesunde Entwicklung der Persönlichkeitsfunktionen in der frühen Kindheit stellen dabei sichere Beziehungen und Bindungen dar (Innamorati et al., 2017). Es wird angenommen, dass die Entwicklung mentaler Repräsentanzen innerer Zustände (siehe hierzu auch 1.4) durch emotionale Spiegelungsprozesse der Bezugspersonen im Säuglingsalter erfolgt und dass diese inneren mentalen Repräsentanzen die Grundlage für die wachsende kindliche Fähigkeit der eigenen Affektregulation darstellen. Ein relativ neues Kernkonzept, das mit einer sicheren Bindung und damit auch Mentalisierungsfähigkeit verbunden ist, stellt die Entwicklung des epistemischen Vertrauens dar (siehe hierzu auch 1.5), also der Fähigkeit einzuschätzen, ob Informationen einer anderen Person oder Quelle vertrauenswürdig, für einen selbst relevant und generalisierbar auf andere Kontexte sind (Fonagy & Allison, 2014). Dabei sind Individuen mit einem höheren Level epistemischen Vertrauens selektiv und angemessen offen für Gelegenheiten des sozialen Lernens in positiven sozialen Situationen (C. Campbell et al., 2021).

Das hochprävalente *soziale Phänomen* der belastenden Kindheitserfahrungen (Adverse Childhood Experiences (ACEs)), siehe hierzu auch 1.2) umfasst u. a. Erfahrungen von Missbrauch und Vernachlässigung in der Kindheit und stellt starke Störungen dieser Entwicklungsprozesse dar (Fonagy, Campbell, et al., 2017; Fonagy, Luyten, et al., 2017; Luyten et al., 2020; Maercker et al., 2021). Gleichwohl sind sie lange etablierte Risikofaktoren für eine Vielzahl physiologischer Gesundheitsprobleme (Hughes et al., 2017; Wöller & Reddemann, 2006) und psychischer Belastungen (Riedl et al., 2020) im Erwachsenenalter. Speziell auch für hochprävalente somatische Erkrankungsbilder wie beispielsweise den Diabetes mellitus rückt zunehmend ihre Bedeutung in den Fokus (Kruse & Ladwig, 2017), womit von ihnen eine besondere Vulnerabilität ausgeht (siehe hierzu auch 1.6).

1.1. ZIELSETZUNG DER HABILITATIONSSCHRIFT

Belastende Kindheitserfahrungen stellen ein hochprävalentes und weltweites Phänomen dar (Ajilian Abbasi et al., 2015), das mit biologischen, psychologischen und sozialen Folgen einhergeht. Es findet sich umfangreiche Evidenz sowohl aus prospektiven Studien als auch Querschnittsuntersuchungen, die eine enge Verbindung zwischen belastenden Kindheitserfahrungen und der Entwicklung psychischer Beeinträchtigungen und Störungen (Afifi et al., 2017; Carr et al., 2020; Gardner et al., 2019; Klinger-König et al., 2023; Krakau et al., 2021; M. Li et al., 2016a; Riedl et al., 2020) sowie chronischer körperlicher Erkrankungen und körperlicher Gesundheitsprobleme (Beutel et al., 2017; Ernst et al., 2019; Hughes et al., 2017; Klinger-König et al., 2023; Riedl et al., 2020) nahelegt. So zeigen beispielsweise neuere prospektive Studien auf, dass die Neuerkrankungsrate für einen Diabetes insbesondere bei Menschen mit emotionalen Missbrauchserfahrungen gegenüber Menschen ohne solche deutlich erhöht ist (Atasoy et al., 2022). Ziel der Habilitationsschrift ist es, über die Bedeutsamkeit der belastenden Kindheitserfahrungen als Risikofaktoren hinaus besser zu verstehen, inwieweit Facetten der Persönlichkeitsentwicklung diesen Zusammenhängen zugrunde liegen. Gleichzeitig erfolgt hierdurch ein wichtiger Beitrag zur Evidenzbasierung dieser transdiagnostischen und bisher überwiegend theoretisch und klinisch fundierten Konstrukte, wobei ein besonderer Stellenwert dem epistemischen Vertrauen zukommen wird, die ein Novum in diesem Bereich darstellt. Die besondere Bedeutung der Persönlichkeitsfunktionen soll auch in der Zusammenschau mit chronischen körperlichen Erkrankungen am Beispiel Diabetes mellitus näher betrachtet werden.

Die vorliegende Habilitationsschrift adressiert primär die Rolle der Persönlichkeitsfunktionen – insbesondere der psychodynamisch orientierten transdiagnostische Konzepte **Strukturniveau**, **Mentalisierungsfähigkeit** und **Epistemisches Vertrauen** – im Zusammenhang zwischen

- * **belastende Kindheitserfahrungen** und **psychischen Störungen** (siehe 2.2),
- * **belastende Kindheitserfahrungen** und **chronischen körperlichen Erkrankungen** am Beispiel **Diabetes mellitus** im Erwachsenenalter (siehe 2.3).

Basierend auf epidemiologischen Querschnittsuntersuchungen bevölkerungsrepräsentativer Daten sowie im klinischen Kontext von prä-post-Untersuchungen werden diese Zusammenhänge vertiefend betrachtet. Auch wenn letztlich longitudinale Untersuchungen erforderlich sind, um Kausalzusammenhänge abzubilden, sollen die hier vorgestellten Arbeiten einen ersten Ansatzpunkt zur Evidenzbasierung dieser Verbindungen darstellen und zukünftige Forschung inspirieren.

1.2. BELASTENDE KINDHEITSERFAHRUNGEN

Für die Einordnung belastender Kindheitserfahrungen finden sich national wie international engere und weitere Definitionen. Eine Definition im weiteren Sinne wurde wegweisend von Felitti und Kolleg:innen in den 1990er Jahren unter dem Oberbegriff *belastende Kindheitserfahrungen* zusammengefasst. Belastende Kindheitserfahrungen umfassen demnach primär Kindesmisshandlungen sowie zudem familiäre Störungen wie abwesende (z. B. im Gefängnis) oder hoch belastete (z. B. psychische Erkrankung, Abhängigkeitserkrankung) Eltern(teile) (Felitti et al., 1998; Witt et al., 2019). Im engeren oder auch spezifischeren Sinne definiert die Weltgesundheitsorganisation (WHO) den Begriff der Kindesmisshandlung (child maltreatment), der alle Formen körperlicher oder emotionaler Vernachlässigung sowie sexuellen, körperlichen oder emotionalen Missbrauchs in der Kindheit umfasst (World Health Organization, 1999). Traumatisierungen z. B. in Form von Missbrauchserfahrungen (abuse) stellen dabei eine besonders schwere Form der belastenden Kindheitserfahrungen dar. Konzeptuell umfassen belastende Kindheitserfahrungen demnach belastende Ereignisse der Kindheit, die in ihrer Schwere variieren und oft wiederholt auftreten, die sich in der Familie oder im sozialen Umfeld eines Kindes finden und die Schaden oder Leid verursachen (Kalmakis & Chandler, 2014). In Forschung und Wissenschaft werden methodisch in der Regel primär drei Konstrukte unterschieden: (1) Belastende Kindheitserfahrungen (Kindesmisshandlungen + familiäre Störungen), (2) Kindesmisshandlung sowie (3) als besonders belastende Form der Kindesmissbrauch. Dabei stellt sich methodisch die Herausforderung, dass der weit überwiegende Anteil der Studien die belastenden Kindheitserfahrungen retrospektiv erhebt. Auch wenn im Sinne der Inhaltsvalidität (Erinnerungsbias) nicht vollkommen ausgeschlossen werden kann, dass die Verwendung von retrospektiv erhobenen Selbstberichtsmaßen die Interpretierbarkeit einschränkt, findet sich Evidenz, dass retrospektiv und prospektiv erhobene belastende Kindheitserfahrungen das Risiko für Psychopathologien im Erwachsenenalter in gleichem Maße erhöhen (Scott et al., 2012). Darüber hinaus konnte gezeigt werden, dass Psychopathologien als Folge einer subjektiven Wahrnehmung und Verarbeitung belastender Kindheitserfahrungen entstehen, sodass diese in Form von Selbstberichten als gültiges Maß zur Erfassung der Auswirkungen belastenden Kindheitserfahrungen gelten (Danese & Widom, 2020).

Belastende Kindheitserfahrungen im weiteren Sinne stellen ein weltweites Phänomen dar (Ajilian Abbasi et al., 2015), von dem angenommen wird, dass allein in Europa über 55 Millionen Kinder (Sethi et al., 2018) und speziell in Deutschland etwa 44 % der Allgemeinbevölkerung (Witt et al., 2019) betroffen sind, was belastende Kindheitserfahrungen zu einem globalen und hoch

prävalenten Problem machen. Es findet sich umfangreiche Evidenz, die nahelegt, dass es eine enge Verbindung zwischen belastenden Kindheitserfahrungen und der Entwicklung psychischer Belastungen einschließlich psychischer Störungen im Erwachsenenalter gibt (Afifi et al., 2017; Carr et al., 2020; Gardner et al., 2019; Klinger-König et al., 2023; Krakau et al., 2021; M. Li et al., 2016a; Riedl et al., 2020). So zeigte eine Metaanalyse auf, dass Menschen mit belastenden Kindheitserfahrungen ein doppelt so hohes Risiko für depressive Störungen und ein 2,7-fach erhöhtes Risiko für Angststörungen haben (M. Li et al., 2016a). Unter den psychischen Störungen werden gehäuft posttraumatische Belastungsstörungen (PTBS) und Borderline Persönlichkeitsstörungen (BPS) mit einer Vorgeschichte von belastenden Kindheitserfahrungen in Verbindung gebracht (Bohus et al., 2020; Gilbert et al., 2009; Hailes et al., 2019; Hoeboer et al., 2021; Messman-Moore & Bhuptani, 2017). Besonders die spezifischen Symptome, die sich immer wieder bei Individuen mit PTBS sowie einer Vorgeschichte von belastenden Kindheitserfahrungen fanden, führten letztlich zu signifikanten konzeptuellen Veränderungen, sodass in der International Classification of Diseases (ICD)-11 die neue Diagnose der komplexen PTBS (kPTBS) aufgenommen wurde. Die kPTBS umfasst neben einer Vorgeschichte wiederholter oder langanhaltender hoch belastender Erlebnisse – insbesondere in der Kindheit – die diagnostischen Kriterien der PTBS (primär die Trauma-Trias Wiedererleben, posttraumatische Vermeidung und Hyperarousal). Darüber hinaus ist die kPTBS gekennzeichnet durch Störungen der Selbstorganisation: (1) Schwere und anhaltende Probleme bei der Affektregulierung, (2) Probleme mit dem Selbstwert und (3) selbsttherabsetzende Überzeugungen, Schwierigkeiten, Beziehungen aufrechtzuerhalten und sich anderen nahe zu fühlen (Cloitre, 2020; Deutschsprachige Gesellschaft für Psychotraumatologie DeGBT, 2023). Die Vielfalt der PTBS-Symptome (z. B. Wiedererleben, Vermeidung, Hyperarousal), zusätzliche spezifische kPTBS-Symptome (z. B. beeinträchtigte Affektregulation) sowie häufig auftretende Komorbiditäten (z. B. depressive Symptome oder Substanzmissbrauch) bedingen sehr heterogene Gruppen von Patient:innen mit kPTBS und erzeugen einen starken individuellen Leidensdruck, schwerwiegende Beeinträchtigungen sowie eine erhöhte Morbidität und Mortalität (Karatzias et al., 2019; Meier et al., 2016; Schlenger et al., 2015; Shalev et al., 2017; Sin et al., 2017). Durch die Einführung der kPTBS liegt erstmals eine Diagnose vor, die es ermöglicht, direkt die breiten negativen Auswirkungen einer Vorgeschichte wiederholter oder anhaltender belastender Kindheitserfahrungen zu kennzeichnen.

Neben den psychischen Belastungen finden sich auch zunehmend Belege für eine Verbindung zwischen belastenden Kindheitserfahrungen und der Entwicklung von körperlichen Gesundheitsproblemen und chronischen körperlichen Erkrankungen (Beutel et al., 2017; Ernst et al., 2019; Hughes et al., 2017; Klinger-König et al., 2023; Riedl et al., 2020). Für den Diabetes

mellitus konnte gezeigt werden, dass das Risiko, an einem solchen zu erkranken deutlich erhöht ist, wenn sich in der Vorgeschichte belastende Kindheitserfahrungen finden (Huang et al., 2015; Huffhines et al., 2016; Shields et al., 2016). Eine aktuelle Metaanalyse berichtet, dass bei mehr als vier belastenden Lebensereignissen in der Kindheit das Risiko für die Entwicklung eines Typ-2-Diabetes gegenüber Menschen, die keine solchen angaben, um 44 % anstieg (Zhu et al., 2022). Weiter erschwerend kommt hinzu, dass bei Patient:innen mit Diabetes und einer Vorgeschichte belastender Kindheitserfahrungen die Mortalitätsraten, der BMI, der HbA1c und die Prävalenzen psychischer Störungen wie depressive Störungen, Angststörungen und PTBS oder auch suizidaler Gedanken deutlich erhöht sind (J. A. Campbell et al., 2019; Ittoop et al., 2020; Kruse et al., 2023a; Zara et al., under review*).

Obwohl die direkten Zusammenhänge zwischen belastenden Kindheitserfahrungen und psychischen Störungen im Erwachsenenalter gut untersucht sind, verbleibt die Evidenz über die zugrundeliegenden Pfade, durch die belastende Kindheitserfahrungen später im Leben zu der Entwicklung von psychischen Störungen führen können, begrenzt. Bisher postulierte Mechanismen und beteiligte Strukturen, durch die belastende Kindheitserfahrungen das Risiko für Psychopathologien erhöhen, reichen von epigenetischen Prozessen und Genexpression bis hin zu neuroendokrinen, immunologischen und Neurotransmitter-Systemen, Gehirnstrukturen und –funktionen und sozialer Kognition (Cecil et al., 2020; Jaffee, 2017). Zuletzt rückte vermehrt auch die negative Bedeutsamkeit der belastenden Kindheitserfahrungen für die Persönlichkeitsentwicklung in den Fokus (Dagnino et al., 2020; Krakau et al., 2021), wobei insbesondere den Persönlichkeitsfunktionen eine zentrale Rolle zukommt.

1.3. STRUKTURNIVEAU

Die Persönlichkeitsfunktionen beschreiben die basalen psychischen Fähigkeiten, die zur Bewältigung unterschiedlichster Lebensanforderungen als notwendig erachtet werden. Dabei können sie als über die Zeit hinweg relativ stabile Kernkomponenten eines intrapsychischen Systems angesehen werden (Bender et al., 2011; Bender & Skodol, 2007). Die konzeptuellen Grundlagen zur Unterscheidung verschiedener Ebenen der Persönlichkeitsfunktionen wurden von Otto Kernberg gelegt, der ursprünglich den Begriff der Persönlichkeits*organisation* verwendete. Kernberg betonte früh die Relevanz frühkindlicher Beziehungserfahrungen (insbesondere durch die primären Bezugspersonen) für die Entwicklung grundlegender mentaler Fähigkeiten und beschrieb, dass sich Persönlichkeitsfunktionen als Folge komplexer Interaktionen mit Anderen sowie der zugehörigen Affekte dieser Interaktionen entwickeln (Kernberg, 1970, 1993). Die Persönlichkeits*funktionen* als solche wurden erstmals von Gerd Rudolf im Rahmen

Operationalisierten Psychodynamischen Diagnostik (OPD) (siehe unten) als *Strukturachse* konzipiert. Sie beschreiben basale Fähigkeiten in den vier Domänen Wahrnehmung, Regulation, Kommunikation und Bindung sowohl in Bezug auf das Selbst u. a. in den Dimensionen Selbstwahrnehmung und Selbstregulation, als auch mit Bezug auf andere – also im Sinne interpersonellen Verhaltens – u. a. in den Dimensionen Emotionale Kommunikation (Empathie) und Bindung (Ehrenthal & Benecke, 2019). Davon ausgehend, dass sich das Strukturniveau in der Regel in der frühen Kindheit auf der Grundlage der Interaktionen und Erfahrungen des Kindes mit seinen Bezugspersonen entwickelt (Beebe et al., 2010), stellen belastende Kindheitserfahrungen mitunter massive Störungen dieses Entwicklungsprozesses dar (Fonagy, Campbell, et al., 2017; Fonagy, Luyten, et al., 2017; Luyten et al., 2020; Maercker et al., 2021). Erfährt das Kind kein fürsorgliches und verlässlich responsives elterliches Verhalten, steigt die Wahrscheinlichkeit für Schwierigkeiten in der Bildung eines stabilen Selbstbildes und einer stabilen Identität sowie des Eingehens vertrauensvoller und enger Beziehungen im Erwachsenenalter (Fonagy et al., 2000). Heute wird daher angenommen, dass Beeinträchtigungen des Strukturniveaus unmittelbare Folge früher interpersoneller Störungen und Traumatisierungen sind (Back et al., 2021) und dass eine Vorgeschichte von belastenden Kindheitserfahrungen eng mit Beeinträchtigungen der eigenen Identitätswahrnehmung, interpersonellen Schwierigkeiten und einer gestörten Affektregulation assoziiert ist (Cloitre et al., 2019). Beeinträchtigungen des Strukturniveaus werden somit als eine wichtige Ursache für die Entstehung psychischer Störungen im Sinne eines generellen Risiko- oder Vulnerabilitätsfaktors angesehen (Bender et al., 2011; Bender & Skodol, 2007; Sharp & Cano, 2021). Aus psychodynamischer Perspektive unterscheiden sich Individuen dahingehend, wie gut das Strukturniveau integriert ist, wobei in Abstufungen zwischen gut, mäßig, gering bis hin zu desintegriert unterschieden wird. Individuen mit einem gut integrierten Strukturniveau verfügen demnach über die psychischen Fähigkeiten, ein kohärentes Selbstbild zu entwickeln, Affekte zu regulieren, zwischen dem Selbst und anderen zu unterscheiden und zwischenmenschliche Beziehungen einzugehen und aufrechtzuerhalten. Damit haben gut integrierte Individuen einen inneren Raum, um intrapsychische Konflikte zu verarbeiten, während Individuen mit einem geringer integrierten Strukturniveau dies nicht (ausreichend) gelingt und sie versuchen, intrapsychische Konflikte extern zu lösen. Ein desintegriertes Strukturniveau führt sogar dazu, dass Konflikte nicht als eigenzugehörig wahrgenommen werden und daher auf die äußere Welt projiziert werden müssen (Rudolf et al., 1995). Auch prägt das Strukturniveau das psychosoziale Funktionieren im täglichen Leben und ermöglicht es einer Person, sich flexibel an die Realität anzupassen. Ein geringer integriertes Strukturniveau hingegen steht in Zusammenhang mit Problemen in der Selbstwahrnehmung, der Affektregulation, den persönlichen Beziehungen und

der zwischenmenschlichen Kommunikation und bildet sich damit häufig im interaktionellen Verhalten ab.

Als transdiagnostisches und dimensionales Konstrukt gewann das Strukturniveau (im Englischen *personality functioning*) in den letzten Jahren zunehmend an Bedeutung in der klinischen und psychotherapeutischen Versorgung und Forschung. Die Erfassung des Strukturniveaus erlaubt es auf dimensionaler Ebene Persönlichkeitspathologien abzubilden (d. h. zeitlich stabile Muster der Wahrnehmung/Erfahrung, Emotion, Kognition und Verhalten, die verschiedene Situationen und Lebensbereiche überschreiten), anstatt Diagnosen von Persönlichkeitsstörungen als kategoriale Variablen zu betrachten. Damit unterscheidet es sich auch von Konstrukten wie den „Big Five“, die Dimensionen individueller Unterschiede benennt, bei denen zwar die extremen Pole jeder Kategorie als maladaptiv und pathologisch betrachtet werden, nicht jedoch die Variationen entlang des Kontinuums selbst (Coker et al., 2002). Im Vergleich hierzu beschreibt das Strukturniveau Fähigkeits- oder Beeinträchtigungsabstufungen, wobei die Position einer Person auf dem Kontinuum an sich eine bessere oder schlechtere Funktionalität/Flexibilität abbildet. Besondere Beachtung fand das Strukturniveau durch den Einschluss als dimensionales Maß in die jüngste fünfte Überarbeitung des Diagnostic and Statistical Manual of Mental Disorders (DSM-5) sowie die elfte Überarbeitung des ICD (ICD-11) (Morey & Hopwood, 2019; Tyrer et al., 2011; Zimmermann et al., 2019). Für die ICD-11 stellte dies eine bedeutsame Veränderung bei der Klassifikation von Persönlichkeitsstörungen dar, deren vorherige kategoriale Beschreibungen nun durch ein dimensionales Maß ersetzt wurden. Diagnosen von Persönlichkeitsstörungen werden nun auf zwei Ebenen erhoben, der (1) Erfassung des Schweregrades und (2) der Domänenmerkmale (Tyrer et al., 2019). Im DSM-5 findet sich mit dem „Alternative Model for the Assessment of Personality Disorders“, das die Skala zur Einschätzung des Strukturniveaus (Level of Personality Functioning Scale – LPFS) enthält, ebenfalls ein dimensionales Maß, das über Punktwerte eine Aussage über den Grad der Beeinträchtigung erlaubt (Bach & First, 2018; Tyrer et al., 2019). Dabei stellt die LPFS eine Skala dar, deren Entwicklung sich eng an der in Deutschland fest etablierten Strukturachse der zweiten Revision der OPD (OPD-2) orientiert hat (Arbeitskreis OPD, 2006). Die ursprüngliche OPD stellte das erste Klassifikationssystem dar, dass das Strukturniveau systematisch definierte und operationalisierte (Arbeitskreis OPD, 1996). Inzwischen liegt mit der OPD-3 die frisch erschienene dritte Revision vor (OPD, 2023), wobei die Neuerungen in der ICD-11 und dem DSM-5 sowie vorliegende Instrumente wie der OPD-Strukturfragebogen–Kurzform (OPD-SFK) (Ehrenthal et al., 2023[#]) auf der OPD-2 beruhen. Die OPD-2 umfasst ein multiaxiales System, das u. a. das Strukturniveau in den vier Domänen Wahrnehmung, Regulation, Kommunikation und Bindung erfassen kann. Dabei wird jede dieser

Domänen zu sich selbst und anderen in Bezug gesetzt, was letztlich die Erfassung acht basaler Funktionsbereiche mit verschiedenen Fähigkeiten und die Einschätzung eines desintegriert bis gut integrierten Strukturniveaus ermöglicht (erfasst werden können in diesen Bereichen z. B. Fähigkeiten der Affektdifferenzierung, Selbstwertregulierung, Empathie oder Bindungsfähigkeit) (Ehrenthal & Benecke, 2019; OPD Task Force, 2008; Wöller & Kruse, 2014). Beeinträchtigungen des Strukturniveaus sind dabei nicht nur eng mit psychischen Belastungen und Störungen wie beispielsweise depressiven Störungen (Dagnino et al., 2020) und Angststörungen (Gruber et al., 2020) oder auch grundlegenden Konstrukten wie Einsamkeit (Ernst et al., 2023*) oder dem Bindungsverhalten (Klein et al., 2022) verbunden, sie finden auch Anwendung als Kernelement der psychotherapeutischen Behandlungsplanung und Psychotherapieforschung (OPD Task Force, 2008; Zimmermann et al., 2012) oder stellen sogar einen eigenständigen Psychotherapie-Fokus dar (z. B. die strukturbezogene Psychotherapie (Ehrenthal & Benecke, 2019; Rudolf, 2020)).

1.4. MENTALISIERUNGSFÄHIGKEIT

Eine mit dem Strukturniveau eng verbundene Fertigkeit stellt das sozial-kognitive Konstrukt der Mentalisierungsfähigkeit dar (Rishede et al., 2021). Initial von Peter Fonagy und Anthony Bateman konzeptualisiert, um ein verbessertes Verständnis und bessere Behandlungsmöglichkeiten für Patient:innen mit BPS zu erreichen (Fonagy & Bateman, 2008), hat das transdiagnostische Konzept der Mentalisierung in der Psychotherapieforschung in den letzten Jahrzehnten zunehmend an Bedeutung gewonnen. Die Mentalisierungsfähigkeit wird als ein mentaler Prozess definiert, der Verständnis und Repräsentationen innerer mentaler Zustände in sich selbst und anderen ermöglicht, indem die eigenen Gedanken, Bedürfnisse, Emotionen, Wünsche und Sehnsüchte sowie die anderer berücksichtigt werden (Fonagy & Bateman, 2008; Taubner et al., 2019). Dieser Prozess ermöglicht es, einander und sich selbst zu verstehen, indem Überzeugungen über die eigenen mentalen Zustände sowie die der Interaktionspartner entwickelt werden (Fonagy, Luyten, et al., 2017). Mentalisierung kann als eine Erweiterung und Ergänzung der Forschung zur „Theory of Mind“ und zu anderen Ansätzen, die Kompetenzen des Perspektivenwechsels adressieren, eingeordnet werden, wobei insbesondere die Verarbeitung biografisch relevanter Beziehungserfahrungen berücksichtigt werden. Das klinische Konzept konzentriert sich dabei zentral auf den metakognitiven Zugang zu den eigenen Selbstzuständen, Bindungsrepräsentationen und Interaktionen in affektiven Kontexten (Taubner & Volkert, 2016). Mentalisierung als ein Kernaspekt der sozialen Kognition stellt eine äußerst komplexe Fähigkeit dar, die auf zwei Arten von expliziter und impliziter Mentalisierung basiert. *Implizite Mentalisierung* ist durch schnelle und intuitive, vorreflexive und nicht-verbale Informationsverarbeitung ohne bewusste Wahrnehmung

gekennzeichnet. *Explizite Mentalisierung* hingegen ist relativ langsam und stützt sich auf verbale und bewusste Informationsverarbeitung unter Einbezug kognitiver Fähigkeiten (Apperly & Butterfill, 2009). Damit erfolgen Interpretationen des Verhaltens anderer in Form von Absichten, Überzeugungen, Wünschen und Emotionen zutreffender und schneller als die detaillierte Verarbeitung eines solchen Verhaltens (Hill et al., 2023).

Die Mentalisierungsfähigkeit stellt eine dynamische und vielschichtige Fertigkeit dar, die besonders im Kontext von Bindungsbeziehungen von Bedeutung ist (Fonagy et al., 2019). Es wird angenommen, dass die Entwicklung mentaler Repräsentationen innerer Zustände durch positive emotionale und verlässliche Spiegelungsprozesse während der Kindheit ermöglicht werden, was die Grundlage für die aufkommende Fähigkeit des Kindes zur Regulation der eigenen Affekte bildet (Probst et al., 2018). Während sichere Bindungen und Beziehungen die Entwicklung adäquater Mentalisierungsfähigkeiten fördern (Innamorati et al., 2017), wird gleichzeitig angenommen, dass Störungen des Bindungssystems die Entwicklung adäquater Mentalisierungsfähigkeiten durch einen Mangel an verlässlichen affektiven Spiegelungen durch die Bezugspersonen kontrahieren (Ball Cooper et al., 2021). So erfährt beispielsweise ein Säugling, der mit seinen Bezugspersonen nur selten interagiert oder dessen Bezugspersonen eine unzureichende emotionale Verbundenheit zum Kind aufrechterhalten, nur wenig Rückmeldung und Input hinsichtlich der eigenen kindlichen und im Gegenüber elterlichen Emotionalität. Dieser Mangel an emotionalem Austausch führt dazu, dass das Kind nicht verstehen lernt, wie Affekte anderer (einschließlich der Affekte der Bezugspersonen) oder auch die eigenen interpretiert werden können, was zu beeinträchtigten Selbstwahrnehmungen und zwischenmenschlichen Interaktionsverständnissen führt (Ball Cooper et al., 2021) und die eigene Emotionsregulation beeinträchtigt (Fonagy & Target, 2002). Im Falle hoch belastender Kindheitserfahrungen findet sich für das Kind kaum Gelegenheit, die eigene innere Welt zu reflektieren, da es gezwungen ist, sich ausschließlich auf die hoch belastende Welt im Außen zu konzentrieren (Mikulincer & Shaver, 2012).

1.5. EPISTEMISCHES VERTRAUEN

Eine Kernkompetenz im Zusammenhang mit sicheren Bindungen, dem Strukturniveau und damit der Mentalisierungsfähigkeit ist die Entwicklung von epistemischem Vertrauen. Basierend auf den wegweisenden Arbeiten von Dan Sperber (Sperber et al., 2010; Wilson & Sperber, 2012) betonen Peter Fonagy und Elizabeth Allison, dass sichere Bindungsbeziehungen nicht nur für die Entwicklung des Strukturniveaus im Säuglingsalter, sondern auch für die Entwicklung der Fähigkeit des epistemischen Vertrauens von hoher Relevanz sind (Bo et al., 2017; Fonagy, Luyten,

et al., 2017; Fonagy & Allison, 2014). Epistemisches Vertrauen beschreibt dabei das Vertrauen in die Authentizität und persönliche Relevanz von zwischenmenschlich vermitteltem Wissen und darüber, wie das soziale Umfeld funktioniert und wie man sich am besten darin zurechtfindet (Fonagy, Campbell, et al., 2017). Oder mit anderen Worten, die Bereitschaft des Einzelnen neues Wissen von einer anderen Person als vertrauenswürdig, auf andere Kontexte verallgemeinerbar und für das Selbst relevant zu betrachten, im Kern also für soziales Lernen (Fonagy & Allison, 2014). Individuen mit einem höheren Maß an epistemischem Vertrauen sind dadurch charakterisiert, dass sie selektiv und angemessen offen für Möglichkeiten des sozialen Lernens unter günstigen sozialen Umständen sind (C. Campbell et al., 2021).

Bei einer Vorgeschichte mit belastenden Kindheitserfahrungen – insbesondere, wenn sie in schwerer und regelmäßiger Form auftraten – ist das frühe Umfeld eines Kindes charakterisiert durch unzuverlässige oder sogar schädliche Bezugspersonen, was Störungen des Lernens über die soziale Welt bedingen kann, und damit, einen Zusammenbruch oder eine Unterentwicklung des epistemischen Vertrauens (McGuire & Jackson, 2018; Nolte et al., 2023). Epistemisches Misstrauen löst Unsicherheit und eine anhaltende epistemische Wachsamkeit (epistemische Hypervigilanz) aus, die sich in einer Überinterpretation der Motive anderer Menschen äußern kann (Fonagy, Campbell, et al., 2017; Fonagy, Luyten, et al., 2017). In einem Zustand epistemischer Hypervigilanz besteht die Annahme, dass die Absichten des Anderen von den erklärten abweichen, wodurch die Informationsquelle – also das Gegenüber – in seiner Wichtigkeit herabgestuft und nicht respektiert wird, womit auch das vermittelte Wissen nicht oder nur kaum angenommen oder sogar als schädlich fehlinterpretiert wird (d. h. Widerstand gegen soziales Lernen) (Fonagy, Luyten, et al., 2017). Dabei kann ein solches Scheitern der sozialen Kommunikation auf epistemische Hypervigilanz, epistemisches Misstrauen oder sogar epistemisches Freezing zurückzuführen sein, wobei letzteres die Unfähigkeit beschreibt, anderen als Informationsquelle mit Wissen über die Welt und ihre Funktionsweisen zu vertrauen (Fonagy, Campbell, et al., 2017). Epistemisches Misstrauen manifestiert sich also in der Fehlattriution von Absichten und der Annahme schädlicher Motive hinter den Handlungen einer anderen Person, woraus eine epistemische Hypervigilanz diesen Personen gegenüber erfolgt. In einigen Fällen kann umgekehrt jedoch auch ein übermäßiges, unangemessenes epistemisches Vertrauen oder Leichtgläubigkeit entstehen (Fonagy, Luyten, et al., 2017). Epistemische Leichtgläubigkeit beschreibt einen ausgeprägten Mangel an Wachsamkeit und angemessener Unterscheidung zwischen vertrauenswürdigen und nicht vertrauenswürdigen Informationen, was zu einer erhöhten Anfälligkeit für Fehlinformationen und Ausbeutung führt (C. Campbell et al., 2021).

Fonagy und Kollegen legen nahe, dass epistemisches Misstrauen, epistemische Leichtgläubigkeit und epistemische Hypervigilanz Charakteristika vieler Patient:innen mit einer Vorgeschichte traumatischer Erfahrungen und von Persönlichkeitsproblemen sind, sodass von ihnen angenommen wird, dass viele Arten von Psychopathologien durch eine vorübergehende oder dauerhafte Störung des epistemischen Vertrauens und des dadurch beeinträchtigten sozialen Lernprozesses gekennzeichnet sind (Fonagy, Campbell, et al., 2017). Im Umkehrschluss bietet Psychotherapie eine Möglichkeit, durch die Entwicklung epistemischen Vertrauens – das die Möglichkeiten des sozialen Lernens innerhalb und außerhalb der therapeutischen Beziehung ermöglicht – den Teufelskreis epistemischen Misstrauens und epistemischer Leichtgläubigkeit zu durchbrechen (Fonagy et al., 2019; Fonagy & Allison, 2014; E. T. Li et al., 2022). Abbildung 2 gibt eine schematische Übersicht über das Entwicklungsmodell der Assoziationen zwischen Bindung, Mentalisierungsfähigkeit und dem epistemischen Vertrauen adaptiert nach Bo und Kolleg:innen (Bo et al., 2017).

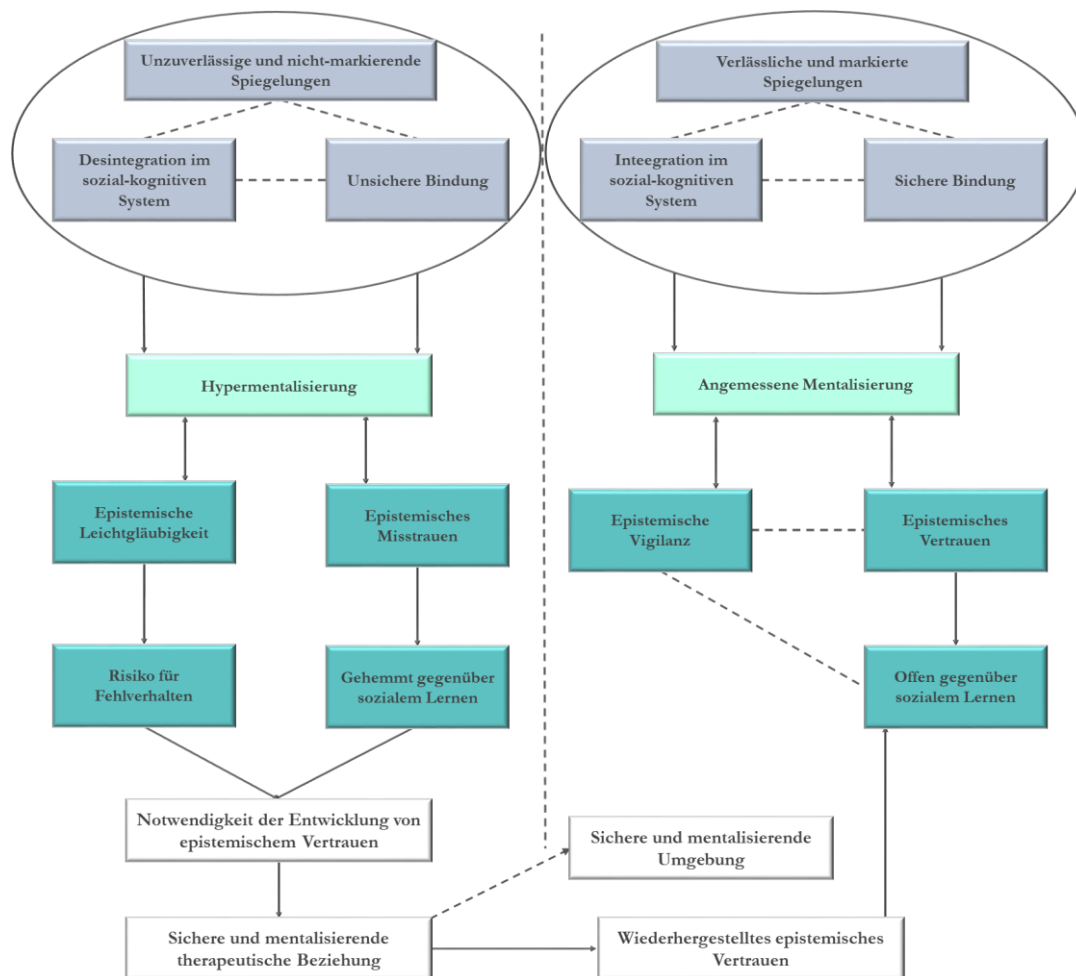


Abbildung 2: Entwicklungsmodell der Assoziationen zwischen Bindung, Mentalisierung und epistemischem Vertrauen adaptiert nach und Kolleg:innen (Bo et al., 2017).

1.6. ZUSAMMENHANG ZWISCHEN BELASTENDEN KINDHEITSERFAHRUNGEN UND CHRONISCHER KÖRPERLICHER ERKRANKUNG AM BEISPIEL DIABETES MELLITUS

Die zuvor beschriebenen Aspekte der Persönlichkeitsentwicklung entstammen in breiten Teilen der Forschung und klinischen Praxis zu Psychologie und Psychotherapie, sodass ihre unmittelbare Relevanz für die Entstehung psychischer Belastungen und Störungen naheliegend ist. In den vergangenen Jahren rückten psychosoziale Aspekte jedoch auch für eine Reihe chronischer körperlicher Erkrankungen in den Fokus. Nachfolgend soll am Beispiel Diabetes mellitus skizziert werden, welche Relevanz belastende Kindheitserfahrungen und das Strukturniveau für die Entstehung und das Behandlungsselbstmanagement haben.

Als Volkserkrankung mit steigender Prävalenz ist es von immenser wissenschaftlicher und klinischer Bedeutung, den Diabetes und dessen Behandlungsherausforderungen besser zu verstehen. Im Jahr 2020 waren in Deutschland mehr als acht Millionen Patient:innen an einem diagnostizierten Typ-2-Diabetes erkrankt. Bei etwa 32.000 Kindern und Jugendlichen und 340.000 Erwachsenen liegt ein diagnostizierter Typ-1-Diabetes vor (Tönnies, & Rathmann, 2021). Weitere Diabetes-Subtypen sind eher selten. Auch wenn in zahlreichen Studien die Subtypen des Diabetes nicht ausreichend differenziert werden, beziehen sich die nachfolgenden Aussagen primär auf Patient:innen mit Typ-2-Diabetes. Wesentlich für die rasch fortschreitende Entwicklung des Typ-2-Diabetes ist ein westlicher Lebensstil, wobei insbesondere Übergewicht, Bewegungsmangel und immunologische sowie genetische Faktoren dabei mit psychosozialen Faktoren interagieren (Kampling & Kruse, 2020*). So finden sich bei Patient:innen mit Diabetes oft deutlich erhöhte Prävalenzen psychischer Störungen im Vergleich zur Allgemeinbevölkerung, wobei dies insbesondere für den Typ-2-Diabetes gilt. Aktuelle Studien legen hinsichtlich des gleichzeitigen Auftretens eines Diabetes und beispielsweise depressiver Störungen bidirektionale Zusammenhänge nahe. So ist bei Patient:innen mit depressiver Symptomatik das Risiko für das Auftreten eines Typ-2-Diabetes um bis zu 48 % erhöht, bei einer schweren depressiven Episode sogar um bis zu 72 % (Deleskog et al., 2019). Dabei interagiert die Depression mit den somatischen Risikofaktoren. Insbesondere bei adipösen Menschen steigert die depressive Symptomatik das Risiko für die Entwicklung des Typ-2-Diabetes (Atasoy et al., 2018). Gleichzeitig zeigt sich bei Patient:innen mit Diabetes ein um 34 % erhöhtes Risiko für das Auftreten von depressiven Störungen (Chirch et al., 2019). Rund 28 % aller Patient:innen mit Typ-2-Diabetes weisen eine depressive Symptomatik auf (Khaledi et al., 2019). Eine aktuelle Metaanalyse berichtet doppelt so hohe Punktprävalenzen depressiver Störungen bei Patient:innen mit Diabetes (9,2 %) im Vergleich

zur Allgemeinbevölkerung ohne Diabetes (4,3 %) (Wang et al., 2019). Menschen mit Diabetes erkranken somit vermehrt an Depressionen und Menschen mit Depression entwickeln vermehrt einen Diabetes (Chireh et al., 2019; Kruse et al., 2023b*). Liegen der Diabetes und die depressive Störung dann gleichzeitig vor, finden sich u. a. deutliche Hinweise auf ein gesteigertes Risiko für diabetesassoziierte Folgeerkrankungen und eine erhöhte Mortalität (Wu et al., 2020). Zudem konnte gezeigt werden, dass beispielsweise Angststörungen einen Übergang von einem subklinischen Prädiabetes zu einem klinischen Typ-2-Diabetes begünstigen (Jiang et al., 2020). Auch Patient:innen mit PTBS haben ein deutlich erhöhtes Risiko, an Typ-2-Diabetes zu erkranken (Vancampfort et al., 2016). Nicht zuletzt aufgrund des häufig gleichzeitigen Vorliegens psychischer Störungen und dem Diabetes rücken damit zunehmend auch psychosoziale Belastungsfaktoren wie belastende Kindheitserfahrungen in den Blickpunkt.

Aktuelle Forschung beschäftigt sich zunehmend mit den negativen Auswirkungen einer Vorgeschichte von belastenden Kindheitserfahrungen und dem Diabetes, wobei belastende Kindheitserfahrungen mit einem deutlich erhöhten Risiko für Diabetes im Erwachsenenalter verbunden sind (Huang et al., 2015; Huffhines et al., 2016; Kruse & Ladwig, 2017; Shields et al., 2016). So fand sich nicht nur ein deutlich erhöhtes Risiko für die Entwicklung psychischer Störungen als Folge einer Vorgeschichte von belastenden Kindheitserfahrungen (M. Li et al., 2016a), es ließ sich vielmehr in einer aktuellen Metaanalyse ebenfalls zeigen, dass bei einer Vorgeschichte mit mehr als vier belastenden Lebensereignissen in der Kindheit das Risiko für das Vorliegen eines Typ-2-Diabetes gegenüber Menschen, die keine solchen angaben, um 44 % anstieg (Zhu et al., 2022). Insbesondere schwere und chronische Formen des sexuellen Missbrauchs sowie die Vernachlässigung scheinen insgesamt signifikant mit einem erhöhten Risiko an einem Typ-2-Diabetes zu erkranken assoziiert, wobei hier eine Dose-Response-Beziehung zu bestehen scheint (Kruse & Ladwig, 2017; Rich-Edwards et al., 2010). Auch wenn sich die Befundlage hierzu nicht immer ganz homogen präsentiert, bestätigen weitere aktuelle Studien und Metaanalysen diese Zusammenhänge weitestgehend (J. A. Campbell et al., 2018; Zhu et al., 2022). Auch neuere prospektive Studien zeigen auf, dass die Neuerkrankungsrate für einen Diabetes insbesondere bei Menschen mit emotionalen Missbrauchserfahrungen gegenüber Menschen ohne solche deutlich erhöht ist (Atasoy et al., 2022). Die besonders ungünstigen Auswirkungen einer Vorgeschichte von belastenden Kindheitserfahrungen bei Patient:innen mit Diabetes spiegeln sich insbesondere in den gesteigerten Mortalitätsraten, einem höheren BMI sowie einer problematischeren Blutzuckereinstellung (HbA1c) wider (J. A. Campbell et al., 2019; Ittoop et al., 2020), was die Relevanz eines besseren Verständnisses der zugrundeliegenden Zusammenhänge zwischen belastenden Kindheitserfahrungen und der Diabetes einmal mehr betont.

2. DISKUSSION

2.1. NORMIERUNG DER EINGESETZTEN INSTRUMENTE

Ziel der vorliegenden Habilitationsschrift ist es zu untersuchen, welche Rolle Beeinträchtigungen des Strukturniveaus in der Beziehung zwischen belastenden Kindheitserfahrungen mit psychischen Belastungen sowie chronischen körperlichen Erkrankungen am Beispiel des Diabetes mellitus spielen. Hierzu sollte das Strukturniveau zunächst als übergeordnetes Maß in Anlehnung an die OPD-2 erhoben sowie Facetten wie die Mentalisierungsfähigkeit und das epistemische Vertrauen näher beleuchtet werden. Insbesondere der Einbezug des epistemischen Vertrauens stellte hierbei einen signifikanten Beitrag zur aktuellen Forschungslandschaft dar, da auch aufgrund des Neuigkeitswertes des Konstruktes neben theoretischen Erwägungen bisher kaum empirische Forschung in diesem Bereich vorliegt. Sowohl für das Strukturniveau mit dem OPD-SFK (Ehrenthal et al., 2015), als auch die Mentalisierungsfähigkeit mit dem Mentalization Questionnaire (MZQ) (Hausberg et al., 2012) lagen deutsche Versionen der jeweiligen Instrumente bereits vor. Da Validierungen an der deutschen Allgemeinbevölkerung für beide Instrumente noch ausstanden, erfolgten im Rahmen der Habilitation neben umfänglichen Validitäts- und Reliabilitätsprüfungen auch das Erstellen deutscher Normen der Allgemeinbevölkerung sowohl für den OPD-SFK (4.1 – Publikation I) (Ehrenthal et al., 2023[#]), als auch den MZQ (4.2 – Publikation II) (Riedl et al., 2022[#]). Zur Erfassung des epistemischen Vertrauens in Forschung und Klinik findet der Epistemic Trust, Mistrust and Credulity Questionnaire (ETMCQ) Anwendung, ein Validierungspaper der deutschen 15-Item-Version findet sich derzeit in Vorbereitung.

Der OPD-SFK (siehe auch Anhang 4.1) ist ein 12-Item basierter Fragebogen mit Selbstangaben zu verschiedenen Aspekten des Strukturniveaus, der neben einem zu bevorzugenden Gesamtwert Rückschlüsse auf die drei Skalen *Selbstwahrnehmung*, *Kontaktgestaltung* und *Beziehungsmodell* mit jeweils vier Items ermöglicht. Die Antwortmöglichkeiten reichen dabei von 0 = „trifft gar nicht zu“ bis 4 = „trifft völlig zu“. Mit Summenwerten der jeweiligen Skalen zwischen 0 und 16 (Gesamtsummenwert zwischen 0 und 48), zeigen höhere Werte schwerere Beeinträchtigungen des Strukturniveaus an. Zur Überprüfung der Reliabilität erfolgten Untersuchungen der internen Konsistenz unter Einbezug von McDonald's ω . Prüfungen der Messinvarianz umfassten Geschlechts-, Alters- und Messzeitpunktvergleiche. Validitätsanalysen betrachteten die faktorielle und konvergente Validität. Der OPD-SFK war überwiegend messinvariant für Alter, Geschlecht und Erhebungszeitpunkt und zeigte eine gute bis zufriedenstellende Modellpassung sowie eine gute interne Konsistenz. Zudem liegen mit der aktuellen Originalarbeit erstmals OPD-SFK-Normen vor, die aufgrund der Messinvarianz für Geschlecht und Alter nicht weiter stratifiziert werden

mussten. Auch entwickelten wir erstmal Normen der deutschen Allgemeinbevölkerung für den OPD-SFK (Ehrenthal et al., 2023[#]).

Der MZQ (siehe auch Anhang 4.2) ist ein Fragebogen zur Einschätzung der Mentalisierungsfähigkeit basierend auf Selbstangaben. Er besteht aus 15 Items mit Antworten, die auf einer fünf-stufigen Likert-Skala von 1 = „stimme überhaupt nicht zu“ bis 5 = „stimme voll und ganz zu“ reichen. Die Summenwerte der Gesamtskala reichen von 15 bis 75, wobei höhere Werte auf eine geringere Mentalisierungsfähigkeit bzw. Mentalisierungsschwächen hinweisen. Um die Reliabilität des MZQ zu bewerten, wurden für alle Items korrigierte Item-Gesamtkorrelationen berechnet ($r < 0,3$ wurde dabei als schwacher Zusammenhang gewertet) und die interne Konsistenz (McDonald's ω) für den Gesamtwert sowie die Subskalen berechnet. Die Validitätsanalysen umfassten Untersuchungen der faktoriellen, konvergenten und diskriminanten Validität des MZQ. Die initial in einer klinischen Stichprobe postulierten vier Subskalen „Ablehnung von Selbstreflexion“ (4 Items), „emotionale Wahrnehmung“ (4 Items), „psychischer Äquivalenzmodus“ (4 Items) und „Affektregulation“ (3 Items) (Hausberg et al., 2012) konnten basierend auf bevölkerungsrepräsentativen Daten in Deutschland nicht bestätigt werden, sodass für die Nutzung in der Allgemeinbevölkerung der Einsatz der 15-Item Gesamtskala oder einer gekürzten 6-Item Gesamtskala empfohlen wird. Hierfür fanden sich eine gute interne Konsistenz sowohl für die 15-Item- als auch die 6-Item-Gesamtskala. Zudem entwickelten wir erstmal alters- und geschlechtsspezifische Normen der deutschen Allgemeinbevölkerung (Riedl et al., 2022[#]).

Da es sich beim epistemischen Vertrauen um ein sehr junges Konstrukt handelt, wurde ein Instrument zu dessen Erfassung in Form eines Fragebogens mit Selbstangaben erstmals 2021 von Campbell und Kolleg:innen veröffentlicht (C. Campbell et al., 2021). Der ETMCQ (siehe auch Anhang 4.3) umfasste in seiner ursprünglichen englischsprachigen Form 18 Items. Erste Analysen basierend auf Repräsentativdaten der deutschen Bevölkerung legten jedoch den Einsatz einer 15 Item Version nahe, die in den nachfolgend vorgestellten Analysen auch Eingang fand. Ein entsprechendes Paper, das die Ergebnisse der Validierung und Normierung vorstellt ist derzeit in Vorbereitung. In seiner 15-Item-Version erfasst der ETMCQ die Subskalen *epistemisches Vertrauen*, *epistemisches Misstrauen* und *Leichtgläubigkeit* auf einer sieben-stufigen Likert-Skala. Die Antwortmöglichkeiten reichen von 1 = „starke Ablehnung“ bis 7 = „starke Zustimmung“ und resultieren in einem Gesamtsummenwert zwischen 15 und 105, wobei hohe Werte ein hohes Vertrauen, Misstrauen oder Leichtgläubigkeit implizieren. Ein hohes epistemisches Vertrauen spiegelt die Fähigkeit einer Person wider, offen für Möglichkeiten des sozialen Lernens zu sein, während ein hohes Misstrauen impliziert, dass Informationsquellen tendenziell eher als

unzuverlässig wahrgenommen werden und es damit eher vermieden wird, durch äußere Kommunikationsquellen beeinflusst zu werden. Eine hohe Leichtgläubigkeit hingegen deutet an, dass Personen sich unsicher über den eigenen Standpunkt sind, was letztlich zu einer hohen Vulnerabilität für Fehlinformationen und das Ausnutzen durch andere führen kann (C. Campbell et al., 2021).

Mit den Gesamtskalen des OPD-SFK und des MZQ sowie den Subskalen des ETMCQ liegen damit für den deutschen Sprachgebrauch valide und reliable Instrumente zur Erfassung des Strukturniveaus, der Mentalisierungsfähigkeit sowie des epistemischen Vertrauens, epistemischen Misstrauens und der epistemischen Leichtgläubigkeit vor.

2.2. BELASTENDEN KINDHEITSERFAHRUNGEN UND PERSÖNLICHKEITS-FUNKTIONEN BEI PSYCHISCHEN BELASTUNGEN UND STÖRUNGEN

Wie in 1.1 beschrieben stellen belastende Kindheitserfahrungen ein hochprävalentes weltweites Phänomen dar (Ajilian Abbasi et al., 2015; Sethi et al., 2018). Dabei gehen sie mit einem deutlich erhöhten Risiko für eine Vielzahl psychischer Belastungen und Störungen (Afifi et al., 2017; Carr et al., 2020; Gardner et al., 2019; Klinger-König et al., 2023; Krakau et al., 2021; M. Li et al., 2016a; Riedl et al., 2020) sowie chronischer körperlicher Erkrankungen (Beutel et al., 2017; Ernst et al., 2019; Hughes et al., 2017; Klinger-König et al., 2023; Riedl et al., 2020) – spezifisch dem Diabetes (Huang et al., 2015; Huffhines et al., 2016; Shields et al., 2016) – einher. Diese direkte Assoziation zwischen belastenden Kindheitserfahrungen und (a) psychischen Belastungen und Störungen sowie (b) chronischen körperlichen Erkrankungen ist auch noch einmal schematisch in Abbildung 3 dargestellt (für weitere Details zu den Zusammenhängen mit chronischen körperlichen Erkrankungen am Beispiel Diabetes siehe 2.3).

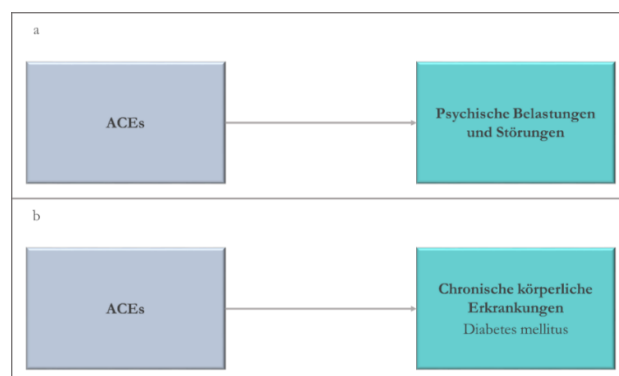


Abbildung 3 a und b: Schematische theoretische Darstellung der direkten Assoziation zwischen belastenden Kindheitserfahrungen und (a) psychischen Belastungen und Störungen sowie (b) chronischen körperlichen Erkrankungen.

Belastende Kindheitserfahrungen bedingen dabei langanhaltende negative Auswirkungen auf die psychische Gesundheit (Gilbert et al., 2009) und stehen als Risikofaktoren in unmittelbarem Zusammenhang mit einer Reihe von psychischen Störungen wie beispielsweise depressiven Störungen (M. Li et al., 2016b; Tan & Mao, 2023), Angststörungen (Bellis et al., 2019; M. Li et al., 2016b), kPTBS und PTBS (Ajilian Abbasi et al., 2015; Bohus et al., 2020; Cloitre, 2020; Hailes et al., 2019; Messman-Moore & Bhuptani, 2017), dissoziativen Störungen (Vonderlin et al., 2018), Persönlichkeitsstörungen wie der BPS (Porter et al., 2020) oder auch vermeidenden, abhängigen und zwanghaften Persönlichkeitsstörungen (Crisan et al., 2023), bipolare Störungen (Palmier-Claus et al., 2016) oder auch Essstörungen (Brewerton, 2022). Als Erklärungsansatz auf biologischer Ebene werden bidirektionale Zusammenhänge, die sowohl epigenetische Prozesse und Genexpression umfassen, aber auch neuroendokrine, immunologische und Neurotransmitter-Systeme sowie strukturelle und funktionelle Veränderungen des Gehirns, diskutiert (Cecil et al., 2020; Jaffee, 2017). Auf psychischer Ebene wird zunehmend postuliert, dass die ungünstigen Auswirkungen der belastenden Kindheitserfahrungen auf die adäquate Entwicklung der Persönlichkeitsfunktionen maßgeblich an der Entwicklung psychischer Störungen beteiligt sind. Entwicklungspsychologische Studien legen nahe, dass neben biologischen Prozessen die Persönlichkeitsfunktionen den Zusammenhang zwischen belastenden Kindheitserfahrungen und psychischen Belastungen vermitteln, womit das Strukturniveau, die Mentalisierungsfähigkeit und das epistemische Vertrauen potenzielle Mediatoren dieses Zusammenhangs darstellen (für eine schematische Darstellung siehe Abbildung 4).

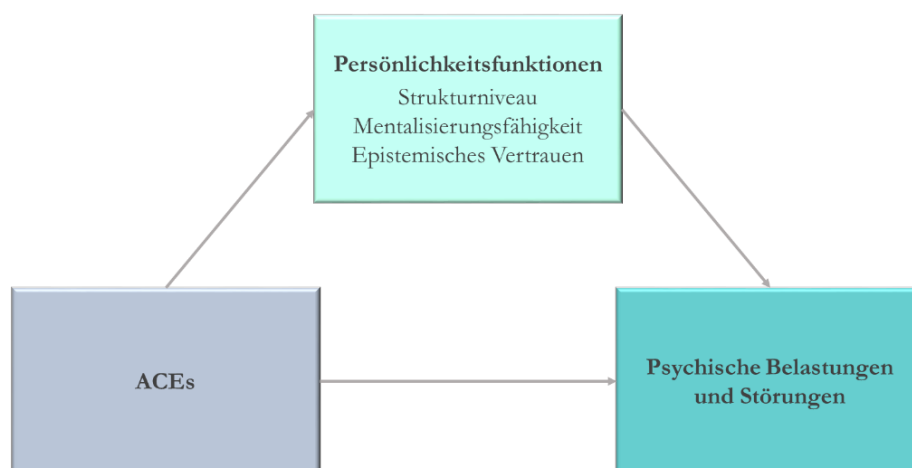


Abbildung 4: Schematische theoretische Darstellung des angenommenen Mediationseffekts der Persönlichkeitsfunktionen im Zusammenhang zwischen belastenden Kindheitserfahrungen und psychischen Belastungen.

In vier der Habilitationsschrift zugrundeliegenden Arbeiten konnte gezeigt werden, dass die direkten Zusammenhänge zwischen belastenden Kindheitserfahrungen und psychischen Belastungen in Form von Depressivität und Ängsten (4.3 – Publikation III) (**Freier et al., 2022b[#], 2022a^{*}**), nicht-suizidalen Selbstverletzungen und Suizidversuchen (4.4 – Publikation IV) (**Ernst et al., 2022[#]**), dissoziativen Symptomen (4.5 – Publikation V) (**Wagner-Skacel et al., 2022[#]**) sowie kPTBS- und PTBS-Symptomen (4.6 – Publikation VI) (**Kampling, Kruse, et al., 2022[#]**) durch die Persönlichkeitsfunktionen mediert wurden. Damit tragen diese Arbeiten zu der wachsenden Literatur bei (Dagnino et al., 2020; Krakau et al., 2021), die zeigt, dass ACE-vermittelte Veränderungen des Strukturniveaus einen Mechanismus in der Pathogenese verschiedener Psychopathologien darstellen können. Während die Persönlichkeitsfunktionen bisher überwiegend im Zusammenhang mit der Psychopathologie von Persönlichkeitsstörungen empirisch untersucht wurden (Doering et al., 2018), betonen die vorgestellten Arbeiten zudem deren Bedeutsamkeit für die allgemeine psychische Gesundheit nach einer Vorgeschichte mit belastenden Kindheitserfahrungen.

2.2.1. DEPRESSIVITÄT UND ÄNGSTE

Davon ausgehend, dass beispielsweise Störungen der Affektivität (u. a. Wahrnehmung, Differenzierung, Kommunikation) häufig Ausdruck eines beeinträchtigten Strukturniveaus sind und sich somit in Folge einer gestörten emotionalen Entwicklung nach einer Vorgeschichte mit belastenden Kindheitserfahrungen ergeben können (Harms et al., 2019), ist es naheliegend, diesen Mechanismus im Umgang mit z. B. depressiven Störungen und Angststörungen mitzudenken, bei denen Störungen der Affektivität ebenfalls eine entscheidende Rolle spielen. Freier und Kolleg:innen legen nahe, dass bis zu zwei Dritteln des Zusammenhangs von belastenden Kindheitserfahrungen mit Depressivität und Ängstlichkeit durch das Strukturniveau mediert werden, wobei schwerere belastende Kindheitserfahrungen mit höheren Beeinträchtigungen des Strukturniveaus und stärkeren Depressions- und Angstsymptomen einhergingen (**Freier et al., 2022b[#], 2022a^{*}**). Ähnliches fand sich für die schwer belastenden Symptome Suizidalität und Selbstverletzung – insbesondere erstere ist häufig mit schweren depressiven Episoden vergesellschaftet. Hier zeigten Ernst und Kolleg:innen erstmals, dass der medierende Effekt des Strukturniveaus 48,8 % des Gesamteffekts im Zusammenhang zwischen belastenden Kindheitserfahrungen und Suizidalität/Selbstverletzung ausmachte (**Ernst et al., 2022[#]**), und das, obwohl das genutzte Erhebungsinstrument OPD-SFK die mit Suizidalität und Selbstverletzungen assoziierte Facette Impulskontrolle nicht umfasst.

2.2.2. DISSOZIATIVE SYMPTOME

Eine weitere Arbeit untersuchte den Zusammenhang zwischen belastenden Kindheitserfahrungen und Dissoziationssymptomen, wobei hier insbesondere die Bedeutsamkeit der Mentalisierungsfähigkeit gezeigt werden konnte. Dissoziation beschreibt eine besonders schwere Störung, die es einer Person als mentalen Schutzprozess ermöglicht, schwer belastende Ereignisse zu ertragen, indem hochinkohärente oder überwältigende Gedanken, Erinnerungen und Gefühle abgespalten werden (Schimmenti, 2018). Solche Unterbrechungen der Integration von Bewusstsein, Gedächtnis, Identität, Emotion, Wahrnehmung, Körperrepräsentationen, motorischer Kontrolle und Verhalten können dabei alle Bereiche der Persönlichkeitsfunktionen und der Integration des Selbst betreffen (Heim & Nemeroff, 2001). Schwer belastende Kindheitserfahrungen werden als so intensiv schädigende Ereignisse betrachtet, dass sie es den Betroffenen unmöglich machen können, diese Erfahrung auf symbolischer Ebene zu integrieren, womit sie schwerste Beeinträchtigungen des Strukturniveaus verursachen (McGowan et al., 2009). Es wird angenommen, dass die frühen Bindungsstörungen zu Mentalisierungsschwächen führen, die die Zusammenhänge der belastenden Kindheitserfahrungen mit der dissoziativen Symptomatik bedingen (Sharp et al., 2020). Empirisch konnte dies erstmals aufgezeigt werden. Wagner-Skacel und Kolleg:innen zeigten, dass die Assoziation zwischen belastenden Kindheitserfahrungen und dissoziativer Symptomatik durch die Mentalisierungsfähigkeit mediiert wurde (**Wagner-Skacel et al., 2022#**). Mentalisierungsschwächen können hierbei als ein langfristig dysfunktionaler Anpassungsprozess an eine traumatische Umgebung verstanden werden, bei der dysfunktionale und nicht angepasste Bewältigungsstrategien die Stressreaktion beeinflussen und zu stressabhängigen Veränderungen von einem expliziten zu einem impliziten Mentalisierungsprozess führen (Taubner, 2020).

2.2.3. SYMPTOME POSTTRAUMATISCHER UND KOMPLEXER POSTTRAUMATISCHER BELASTUNGSSTÖRUNGEN

Ein Zusammenhang zwischen belastenden Kindheitserfahrungen und Traumafolgestörungen gilt als fest etabliert, was insbesondere für die Diagnose der kPTBS, bei der wiederholte oder langanhaltende hoch belastende Erlebnisse – insbesondere in der Kindheit – zu den Diagnosekriterien zählen, auch mehr als naheliegend scheint (Gilbert et al., 2009; Hailes et al., 2019; McCutchen et al., 2022; Messman-Moore & Bhuptani, 2017). In klinischen Stichproben ist die kPTBS und die PTBS mit gesteigerten Depressions-, Angst- und Somatisierungssymptomen sowie Beeinträchtigungen des Strukturniveaus verbunden (Barbano et al., 2019; Lampe et al., under

review*; Möller et al., 2021), was u. a. den mit diesen Erkrankungsbildern einhergehenden hohen Leidensdruck mitbedingt. Auch Kampling und Kolleg:innen konnten direkte Zusammenhänge zwischen belastenden Kindheitserfahrungen und der PTBS sowie der kPTBS finden, die basierend auf deutschen bevölkerungsrepräsentativen Daten 8 % respektive 20 % der Varianz erklärten (**Kampling, Kruse, et al., 2022[#]**). Darüber hinaus konnte neben der mediiierenden Rolle des Strukturniveaus erstmals die hohe Bedeutsamkeit des epistemischen Vertrauens im Zusammenhang zwischen belastenden Kindheitserfahrungen und PTBS bzw. kPTBS empirisch aufgezeigt werden. Die Hinzunahme des Strukturniveaus als Mediator steigerte die Varianzaufklärung von 8 % auf 19 % für die PTBS und sogar von 20 % auf 47 % für die kPTBS, während sich die direkten Zusammenhänge verringerten. Die Hinzunahme des epistemischen Vertrauens als Prädiktor für das Strukturniveau steigerte zudem die erklärte Varianz des Strukturniveaus auf 41 % im Vergleich zu den belastenden Kindheitserfahrungen als alleinigem Prädiktor (**Kampling, Kruse, et al., 2022[#]**). Insbesondere für die kPTBS wird u. a. angenommen, dass frühe belastende Kindheitserfahrungen Störungen des epistemischen Vertrauens bedingen, die auch die Entwicklung der Mentalisierungsfähigkeit stark beeinträchtigen (Bo et al., 2017; Fonagy, Luyten, et al., 2017). Als Folge kann es u. a. zu einem vorübergehenden Aussetzen der Mentalisierungsfähigkeit kommen, wenn defensive Reaktionen (Fight-Flight-Freeze) aktiviert werden, um schneller auf unmittelbare Gefahrenreize reagieren zu können. Damit stellen aversive Kindheitserfahrungen eine doppelte Belastung dar, da sie sowohl die Entwicklung der Emotionsregulation als auch der Mentalisierungsfähigkeit beeinflussen (Ingenhoven, 2015) und sich damit letztlich in Beeinträchtigungen des Strukturniveaus äußern.

2.2.4. PSYCHOTHERAPEUTISCHE BEHANDLUNG

Diese Erkenntnisse, insbesondere auch zum epistemischen Vertrauen, können auch in der psychotherapeutischen Behandlung einer Vielzahl von Störungsbildern nutzbar gemacht werden. Obwohl sich das Strukturniveau im Laufe des Lebens konsolidiert und im Allgemeinen als eine Summe stabiler, mentaler Fähigkeiten betrachtet wird, kann es durch hilfreiche Erfahrungen z. B. im Rahmen psychotherapeutischer Behandlungen positiv beeinflusst werden (Ehrenthal & Benecke, 2019; Hörz et al., 2011; Kraus et al., 2021; Leichsenring et al., 2019). So zeigten verschiedene Untersuchungen beispielsweise positive Veränderungen im Kontext von Langzeittherapien (Leuzinger-Bohleber et al., 2019; Lindfors et al., 2019) oder auch im Rahmen von psychotherapeutischem mentalisierungsförderndem Arbeiten (Juil et al., 2021; Rossouw & Fonagy, 2012; Weijers et al., 2020). Interventionen mit dem Ziel, speziell das Strukturniveau zu verbessern, können bei Patient:innen mit belastenden Kindheitserfahrungen in der Vorgeschichte

und einem beeinträchtigten Strukturniveau Verbesserungen in den jeweiligen Symptombereichen erzielen. Zu den aus diesen Überlegungen abgeleiteten Interventionen zählen u. a. die mentalisierungsbasierte Psychotherapie (MBT), ein integrativer psychotherapeutischer Ansatz, der darauf abzielt, Patient:innen dabei zu unterstützen, Gefühle, Wünsche und Erwartungen an sich selbst und andere als Ursache von Handlungen wahrzunehmen und zu verstehen (A. W. Bateman & Fonagy, 2003; Stoffers-Winterling et al., 2022; Volkert et al., 2019) oder auch die strukturbezogene Psychotherapie (Ehrenthal & Benecke, 2019; Rudolf, 2020). Diese strukturbezogenen Verfahren sollen das Selbstwirksamkeitserleben und die Affektwahrnehmung und –regulation fördern (Schechter et al., 2019), die Differenzierung mentaler Repräsentationen von sich selbst und anderen unterstützen (Luyten et al., 2013) und zu nachhaltigen Verbesserungen des allgemeinen psychischen Gesundheitszustands, der globalen Funktionsfähigkeit und der Arbeitsfähigkeit führen (A. Bateman & Fonagy, 1999, 2008). Dem epistemischen Vertrauen kann hierbei eine ganz besondere Rolle zukommen. Bestehendes epistemisches Vertrauen kann dazu beitragen, den Erwerb und die Aufnahme neuer Informationen zu erleichtern und damit ein angemessenes soziales Funktionsniveau und Widerstandsfähigkeit gegenüber herausfordernden Informationen zu entwickeln (Fonagy et al., 2015). Es wird angenommen, dass das Konzept des epistemischen Vertrauens, Misstrauens und der Leichtgläubigkeit einen integralen Bestandteil der psychotherapeutischen Behandlung darstellt, da es die Fähigkeit des Einzelnen stützt, eine vertrauensvolle Beziehung zu den behandelnden Therapeut:innen aufzubauen und daraus resultierend eine Offenheit für den Wissenstransfer im weiteren Sinne zu erlangen, einschließlich des Erlernens unterschiedlicher Ansichten und Perspektiven, was letztlich Verbesserungen auch der Mentalisierungsfähigkeit bedingen kann.

Die Bedeutsamkeit des epistemischen Vertrauens im psychotherapeutischen Kontext konnte erstmals von Riedl & Kampling und Kolleg:innen im Rahmen einer interdisziplinären und multimodalen vollstationären psychosomatischen Rehabilitationsbehandlung gezeigt werden. Übereinstimmend mit vorangehenden Studien wurde eine verbesserte Mentalisierungsfähigkeit als potenziell kritischer Erfolgsfaktor für die psychosomatische Rehabilitation identifiziert (Peters et al., 2022). Neben einer Zunahme der erklärten Varianz von 47 % (direkter Effekt prä-post-stationäre Behandlung) auf 61 % durch die Hinzunahme der Mentalisierungsfähigkeit als Mediator, konnten Riedl & Kampling und Kolleg:innen zudem zeigen, dass eine der Kernkomponenten zur Verbesserung der Mentalisierungsfähigkeit eine Verbesserung des epistemischen Misstrauens darstellte (4.7 – Publikation VII) (**Riedl⁺ & Kampling⁺ et al., 2023[#]**). Bei einer guten Modellpassung und mit einer Zunahme der erklärten Varianz der Mentalisierungsfähigkeit von 9 %

auf 37 % prädizierten Verringerungen des epistemischen Misstrauens und der epistemischen Leichtgläubigkeit sowie Zunahmen des epistemischen Vertrauens signifikant Verbesserungen der Mentalisierungsfähigkeit. Aufbauend auf diesen Ergebnissen wurde in einer größeren Stichprobe die Rolle des epistemischen Vertrauens in Bezug auf die Symptomebene (unterteilt in die drei Gruppen starke, mittlere und geringe/keine Symptomreduktion) während der psychosomatischen rehabilitativen Behandlung betrachtet. Hier konnte gezeigt werden, dass eine hohe Symptomreduktion mit Verbesserungen im epistemischen Vertrauen einhergeht, während umgekehrt eine geringe bis keine Symptomreduktion (oder sogar Verschlechterung) mit Zunahmen im epistemischen Misstrauen und der epistemischen Leichtgläubigkeit verbunden ist. Eine durchschnittliche Symptomreduktion hingegen zeigte keinerlei Assoziationen mit dem epistemischen Vertrauen (Riedl et al., under review*). Eine weitere Studie im gleichen Setting untersuchte zudem gezielt die Auswirkungen der psychosomatischen Rehabilitationsbehandlung bei Patient:innen mit kPTBS. Hier zeigten Lampe und Kolleg:innen, dass die Behandlung nicht nur zu signifikanten Verbesserungen der kPTBS-Symptomatik führte (41 % erfüllten die diagnostischen Kriterien der kPTBS zu Rehabilitationsende nicht mehr), sondern dass diese durch Veränderungen des epistemischen Vertrauens erreicht werden konnte. Zunahmen des epistemischen Vertrauens und Reduktionen der epistemischen Leichtgläubigkeit waren zusammen mit einem geringeren Alter und niedrigeren Depressions-Baselinewerten signifikant mit Baseline-adjustierten Reduktionen der kPTBS-Symptome assoziiert (Lampe et al., under review*).

Es wird angenommen, dass es Verbesserungen im epistemischen Vertrauen sind, die den Aufbau einer vertrauensvollen therapeutischen Beziehung erleichtern (therapeutische Allianz) und eine Umgebung fördern, in der Offenheit für den Wissensaustausch (d. h. soziales Lernen) und die Exploration verschiedener Ansichten und Perspektiven im therapeutischen Prozess ermöglicht wird, während gleichzeitig die therapeutische Beziehung selbst zu Verbesserungen des epistemischen Vertrauens beitragen kann. Es wurde bereits hervorgehoben, dass ein entscheidender Faktor für eine erfolgreiche Psychotherapie darin bestehen kann, den Teufelskreis des epistemischen Misstrauens zu durchbrechen und epistemisches Vertrauen zu schaffen und somit soziales Lernen innerhalb und außerhalb der therapeutischen Beziehung zu fördern (Fonagy et al., 2019; Fonagy & Allison, 2014; E. T. Li et al., 2022). Da insbesondere rehabilitative Settings oft mit einer sozialmedizinischen Beurteilung der Arbeitsfähigkeit und des Funktionsniveaus der Patient:innen durch die Behandler:innen (einschließlich der Psychotherapeut:innen) verbunden sind, kann angenommen werden, dass es sich besonders schwierig gestaltet, in diesem Umfeld eine vertrauensvolle Beziehung aufzubauen. Gleichzeitig ist jedoch auch davon auszugehen, dass die

meisten Patient:innen viele verschiedene positive soziale Interaktionen mit Gesundheitsfachkräften und anderen Patient:innen haben, während sie gleichzeitig Verbesserungen sowohl der körperlichen als auch der psychischen Gesundheit erleben. Fonagy und Kolleg:innen betonen, dass kooperatives soziales Lernen und die Entwicklung von epistemischem Vertrauen innerhalb und außerhalb der therapeutischen Beziehung erfolgen müsse (E. T. Li et al., 2022). Die spezifische Umgebung der stationären psychosomatischen Rehabilitation mit ihrem interdisziplinären Team und der Möglichkeit zur Interaktion mit anderen Patient:innen bietet einen direkten und sicheren Übungsplatz für ein besseres Verständnis von sich selbst und anderen. Diese Erfahrungen können so in einen breiteren Kontext übertragen werden und nachhaltige salutogenetische Rückkopplungsschleifen erzeugen (Fonagy et al., 2022). Die Bedeutung von Vertrauen in der psychotherapeutischen Beziehung wird noch deutlicher, wenn Berücksichtigung findet, dass eine dysfunktionale – und möglicherweise nicht vertrauensvolle – therapeutische Allianz mit nachteiligen Behandlungsergebnissen in Verbindung gebracht wurde (Henn et al., 2021; Reuter et al., 2014). Die Erfahrung positiver – und im besten Falle vertrauenswürdiger – Interaktionen kann jedoch dazu beitragen, das epistemische Misstrauen zu reduzieren und das epistemische Vertrauen zu stärken. Dies wiederum kann den Patient:innen dabei helfen, für therapeutische Begegnungen zugänglicher zu werden und so neben der Psychotherapie z. B. auch die Erkundung der emotionalen und körperlichen Selbstwahrnehmung in der Physiotherapie oder den Entspannungsverfahren erreichen. Damit könnte neben der Mentalisierungsfähigkeit auch dem epistemischen Vertrauen eine Schlüsselrolle in der erfolgreichen psychotherapeutischen Behandlung verschiedener Störungsbilder zukommen.

2.3. BELASTENDE KINDHEITSERFAHRUNGEN UND PERSÖNLICHKEITSFUNKTIONEN BEIM DIABETES MELLITUS

Verschiedene Studien zeigen Zusammenhänge zwischen belastenden Kindheitserfahrungen und dem Diabetes mellitus, insbesondere dem Typ-2-Diabetes (Huang et al., 2015; Huffhines et al., 2016; Kruse & Ladwig, 2017; Shields et al., 2016). Vermittelt über neurobiologische Faktoren, eine gestörte Selbstfürsorge oder auch ungünstige Lebensweisen im Bereich Ernährung und Bewegung scheint insbesondere das Selbstmanagement des Diabetes bei einer Vorgeschichte belastender Kindheitserfahrungen beeinträchtigt (Kruse et al., 2018). Ein ungesunder meist westlicher Lebensstil – einschließlich Rauchen, Bewegungsmangel und Übergewicht – stellt einen der wesentlichen Prädiktoren für die Entstehung eines Typ-2-Diabetes dar (La Sala & Pontiroli, 2020; Maddatu et al., 2017). Es finden sich inzwischen eine Vielzahl von Studien, die einen Zusammenhang von belastenden Kindheitserfahrungen mit den Diabetes-Risikofaktoren Nikotin-

und Alkoholabhängigkeit sowie Adipositas und Bewegungsmangel belegen (Hughes et al., 2017; Kruse et al., 2023a*). Offen bleibt, über welchen Mechanismus belastende Kindheitserfahrungen dieses Risikoverhalten letztlich begünstigen, sowohl in der Allgemeinbevölkerung als auch spezifisch bei Patient:innen mit Diabetes. Es kann angenommen werden, dass Beeinträchtigungen des Strukturniveaus hier eine Rolle spielen, wobei beispielsweise der Einsatz von Mittel wie Nikotin, Alkohol oder hochkalorischem Essen sowie der Rückzug aus sozialen Beziehungen einer nicht anders möglichen Bewältigung von Stress, undifferenzierten Spannungszuständen und Affekten oder auch Selbstwertkrisen dienen (Kampling & Kruse, 2020*). Diesem Gedankengang folgend wäre das erkrankungsfördernde Verhalten (Bewegungsmangel, hochkalorische Ernährung, etc.) eher als Symptom zu verstehen, dessen Ursache in den mangelnden Fertigkeiten der eigenen Selbstfürsorge oder auch Affektregulation (Schlagwort Stressessen) bestände. In diesem Zusammenhang ist es dann auch nicht verwunderlich, dass belastende Kindheitserfahrungen insbesondere dann die Entwicklung eines Diabetes begünstigen, wenn sich in der Folge psychische Störungen in Form der (k)PTBS, depressiver Störungen oder Angststörung entwickelten (Atasoy et al., 2022) oder das Diabetesrisiko bei Patient:innen mit PTBS abnimmt, wenn die PTBS-Symptomatik (z. B. durch Psychotherapie) reduziert werden kann (Scherrer et al., 2019). Die Rolle des Strukturniveaus im Zusammenhang zwischen belastenden Kindheitserfahrungen und Diabetes konnte erstmals von Zara und Kolleg:innen in einer aktuellen Studie, die auch der Habilitationsschrift zugrunde liegt, nachgewiesen werden. So konnte basierend auf bevölkerungsrepräsentativen Daten gezeigt werden, dass Patient:innen mit Diabetes deutlich häufiger als die restliche deutsche Bevölkerung (32,0 % vs. 19,4 %) eine Vorgeschichte mit belastenden Kindheitserfahrungen mindestens mittleren Schweregrades aufwiesen. Gleichzeitig fand sich, dass der Zusammenhang zwischen Diabetes und belastende Kindheitserfahrungen partial durch ein beeinträchtigtes Strukturniveau mediiert wurde (4.8 – Publikation VIII) (Zara, Brähler, et al., 2023a[#], 2023b*). Damit zeigte sich erstmals, dass ein beeinträchtigtes Strukturniveau bei Patient:innen mit Diabetes und einer Vorgeschichte von belastenden Kindheitserfahrungen beteiligt scheint.

2.3.1. DIABETES-SELBSTMANAGEMENT, PSYCHISCHE BESCHWERDEN UND DIABETESBEZOGENE BELASTUNGEN

Noch deutlicher wird die Rolle des Strukturniveaus, wenn die großen Herausforderungen vieler Patient:innen mit dem Diabetes-Selbstmanagement näher betrachtet werden. Trotz großer technischer Fortschritte wie dem Continuous Glucose Monitoring (CGM) oder der Insulinpumpe, der Einführung von Disease-Management-Programmen (DMP) sowie spezifischen Diabetes-

Schulungs- und Trainingsprogrammen gelingt es einem großen Anteil der Patient:innen nicht, ihren Blutzucker (HbA_{1c}) entsprechend ihren eigenen Zielen einzustellen. Laut dem DMP-Bericht Nordrhein (2019) erreichen 58,4 % aller Patient:innen mit Typ-1-Diabetes und 40,4 % mit Typ-2-Diabetes die vereinbarten Glukosezielwerte nicht (Nordrheinische Gemeinsame Einrichtung, Disease-Management-Programme GbR, 2019). Im Umgang mit dem Diabetes und zur Verhinderung diabetesassoziierter Folgeerkrankungen ist die Blutzucker- (HbA_{1c}) und Blutdruckeinstellung von hoher Relevanz für die Diabetesbehandlung, bei der insbesondere das Selbstbehandlungsverhalten der Patient:innen eine zentrale Rolle spielt. Gründe für ein ungünstiges Selbstbehandlungsverhalten können patient:innenbezogen (z. B. fehlende Risikowahrnehmung, Schwierigkeiten bei der Therapieumsetzung), behandler:innenbezogen (z. B. heterogene Therapieziele) oder umfeldbezogen (z. B. fehlende soziale Unterstützung) sein, sodass in der Behandlung des Diabetes zunehmend auch psychosoziale Aspekte in den Fokus rücken (Kampling & Kruse, 2020*; Kruse et al., 2011, 2018; Kulzer et al., 2013a, 2013b). Diabetesbezogene psychosoziale Belastungen wie allgemeine emotionale Belastungen und spezifische, diabetesbezogene Sorgen (z. B. Angst vor Hypoglykämien) sowie psychische Beschwerden, insbesondere depressive Symptome und Ängste, sind gehäuft bei Patient:innen mit Diabetes anzutreffen und gehen mit einem problematischen Diabetesselbstmanagement, einer geringeren Lebensqualität sowie einer schlechteren Stoffwechseleinstellung einher (Azami et al., 2019; Kampling et al., 2017*, 2018; Snoek et al., 2015). Darüber hinaus führen sie zu einem erhöhten Risiko für Folgeerkrankungen (Ismail et al., 2017) und Mortalität (Hofmann et al., 2013; Kulzer et al., 2018) sowie zu deutlich gesteigerten Kosten für das Gesundheitssystem (Brüne et al., 2021; Hutter et al., 2010). Auch konnte in einer aktuellen Studie gezeigt werden, dass diabetesbezogene Belastungen eng mit einer negativen Emotionalität sowie Problemen der Emotionsregulation zusammenhängen (Coccaro et al., 2021). Damit ergibt sich unter psychosozialen Aspekten für Patient:innen mit Diabetes ein besonderer Versorgungsbedarf, der zum einen das Erreichen einer adäquaten Blutzuckereinstellung ($\text{HbA}_{1c} \leq 7,5 \%$) und zum anderen die Bewältigung bestehender psychischer Beschwerden und diabetesbezogener psychosozialer Belastungen sowie damit verbundenen Beeinträchtigungen des Selbstbehandlungsverhaltens umfassen. Auch aufgrund des gehäuft gemeinsamen Auftretens problematischer Stoffwechseleinstellungen sowie psychischer Belastungen (Kampling et al., 2017*, 2018*; Snoek et al., 2015) rückten daher neben den somatischen Behandlungen in den letzten Jahren zunehmend auch psychotherapeutische und psychopharmakologische Behandlungen in den Fokus, mit dem Ziel, über Reduzierungen der psychischen Beschwerden auch Verbesserungen der Blutzuckereinstellung (HbA_{1c}) zu erreichen

(letzteres u. a. durch Steigerung der Behandlungadhärenz und der Selbstfürsorge oder Verbesserungen des allgemeinen Lebensstils). Trotz einer weiterhin bestehenden Unterversorgung an ambulanten psychotherapeutischen Behandlungsangeboten (Zara, Kampling, et al., 2023*) konnten verschiedene Studien jedoch zeigen, dass psychotherapeutische und psychopharmakologische Behandlungen mit signifikanten Verbesserungen der psychischen Beschwerden einhergehen und damit einen relevanten Therapiebaustein der Diabetes-Behandlung darstellen sollten. Hinsichtlich deren Auswirkungen auf die Blutzuckereinstellung (HbA_{1c}) finden sich jedoch sehr heterogene Ergebnisse. Die Erwartung, die Behandlung psychischer Belastungen allein würde sich allgemein günstig auf die Reduktion des HbA_{1c} auswirken, konnte in verschiedenen Studien nicht erfüllt werden (Baumeister et al., 2012; Petrak, Baumeister, et al., 2015; Petrak, Herpertz, et al., 2015). Der aktuelle Forschungsstand legt nahe, dass in der Hochrisikogruppe von Patient:innen mit Diabetes, bei denen gleichzeitig eine problematische Stoffwechseleinstellung und psychische Belastungen vorliegen, das Therapieziel einer adäquaten Blutzuckereinstellung *nicht* ausschließlich durch somatisch-fokussierte oder psychisch-fokussierte Behandlungen zu erreichen ist. Zudem zeigen neuere Studien, dass es neben psychischen Beschwerden vielmehr auch diabetesbezogene psychosoziale Belastungen sind, die sich bei Patient:innen mit Diabetes ungünstig auf das Selbstmanagement auswirken und daher gezielt adressiert werden sollten (Gonzalez et al., 2011; Lloyd et al., 2010; Snoek et al., 2015).

In diesem Zusammenhang auch die Persönlichkeitsfunktionen zu berücksichtigen ist kein vollständig neuer Ansatz. Dabei wurden insbesondere spezifische Persönlichkeitsaspekte mit diabetesbezogenen Belastungen, der Behandlungadhärenz und der Selbstfürsorge assoziiert (Hazrati-Meimaneh et al., 2020; Sanatkar et al., 2020; Woon et al., 2020). Dabei lag der Forschungsfokus beim Diabetes jedoch eher bei spezifischen Konstrukten der Persönlichkeit anstatt die Persönlichkeitsfunktionen als übergeordnete Mechanismen zu betrachten. Insbesondere die Emotionsregulation in Bezug auf ihren Einfluss auf das Gesundheitsverhalten und das Selbstmanagement hat in diesem Zusammenhang viel Aufmerksamkeit erhalten (Ehrenthal & Benecke, 2019). So finden sich beispielsweise Studien, die eine beeinträchtigte Emotionsregulation mit emotionalem Essen, einem sitzenden Lebensstil und reduzierter körperlicher Aktivität bei Kindern in Verbindung bringen (Aparicio et al., 2016), was letztlich Übergewicht begünstigen kann, welches einen etablierten Risikofaktoren für Typ-2-Diabetes darstellt (Twig et al., 2014; Venables & Jeukendrup, 2009). Mit unmittelbarem Bezug auf das Strukturniveau konnte eine aktuelle Arbeit zudem erstmals zeigen, dass auch das bei Patient:innen mit Diabetes und belastenden Kindheitserfahrungen deutlich gehäufte Auftreten extrem belastender suizidaler Gedanken

(30,0 % vs. 15,7 % bei Patient:innen mit Diabetes ohne belastende Kindheitserfahrungen) partial durch das Strukturniveau mediert wurde (Zara et al., under review*).

2.3.2. PERSÖNLICHKEITSFUNKTIONEN UND BEHANDLUNG

Diese Ergebnisse unterstützen dabei, Aspekte der Ätiologie des Diabetes sowie die oft beobachteten Probleme des Diabetes-Selbstmanagements besser zu verstehen und in Behandlungsangebote zu überführen, die auf die Bedürfnisse dieser Patient:innen-Gruppe zugeschnitten sind. Hinweise hierfür finden sich auch in einer Arbeit aus dem Jahr 2019, wo sich zeigte, dass innerhalb der ersten sechs Monate eines standardisierten DMPs der Erfolg in Form einer Reduktion des HbA1_c nicht etwa durch etwaige depressive Symptome prädictiert werden konnte, sondern vielmehr durch das Strukturniveau (hier sagte ein höheres Strukturniveau stärkere Reduktionen des HbA1_c voraus) (Ehrenthal et al., 2019). Bei Patient:innen mit Diabetes und Belastungen, die über Standardangebote wie DMPs oder Diabeteschulungen nicht ausreichend erreicht werden, kann es daher zielführend sein, psychotherapeutische Angebote zu etablieren, die nicht nur gezielt die diabetesbezogenen und damit spezifischen Belastungen adressieren, sondern auch das Strukturniveau berücksichtigen. Im Rahmen einer randomisierten kontrollierten Studie (RCT) konnte genau dieser Effektivitätsnachweis erstmals erbracht werden, eine Arbeit, die auch der Habilitationsschrift zugrunde liegt. Im deutschen Raum konnte die psy-PAD-Studie zeigen, dass mittels eines integrierten und gezielten psychodynamisch orientierten psychotherapeutischen Behandlungsansatzes, der die Reduktion von diabetesbezogenen Belastungen fokussierte und gleichzeitig das Strukturniveau berücksichtigte, die psychischen und diabetesbezogenen psychosozialen Belastungen reduziert und auch die Stoffwechseleinstellung verbessert wurden (4.9 – Publikation IX) (Kampling, Köhler, et al., 2022[#]). Daneben haben sich international auch integrative Behandlungsansätze, die einen Zugang zu strukturierten, in die Primärversorgung integrierte, interdisziplinäre Versorgungskonzepten erlauben, für Patient:innen mit Diabetes als effektiv erwiesen, psychische Belastungen zu reduzieren und auch Verbesserungen der Blutzuckereinstellung (HbA1_c) zu erreichen (Atlantis et al., 2014). Es bedarf also spezifischerer Versorgungsangebote für Patient:innen mit Diabetes, die derzeit in der Routineversorgung in Deutschland kaum verfügbar sind. Mit neuen Projekten wie der Ed-iPP-Studie (Zara et al., 2022*), wo diabetesbezogene Belastungen aus der subjektiven Perspektive von Patient:innen mit Diabetes erfasst werden sollen oder auch der DFG-geförderten minDBe-Studie, bei der die psy-PAD-Intervention an ein Gruppensetting adaptiert und als neues Versorgungsangebot in die neu gegründeten psychosomatischen Institutsambulanzen (PsIA) implementiert werden soll, wird die Forschung und klinische Erprobung auch in den nächsten Jahren weiter vorangetrieben.

3. ZUSAMMENFASSUNG UND AUSBLICK

Die vorliegende Habilitationsschrift untersucht die gesundheitlichen Folgen belastender Kindheitserfahrungen. Während belastende Kindheitserfahrungen als Risikofaktoren für die Entstehung einer Vielzahl von psychischen Störungen und chronischen körperlichen Erkrankungen diskutiert werden, leistet die Habilitationsschrift darüber hinaus einen Beitrag, die zugrundeliegenden Mechanismen besser verstehen zu lernen und fokussiert dabei die Bedeutung der Persönlichkeitsfunktionen – insbesondere Strukturniveau, Mentalisierungsfähigkeit und Epistemisches Vertrauen – innerhalb dieser Zusammenhänge.

Die Persönlichkeitsfunktionen stellen als basale zugrundeliegende u. a. Bewältigungsfähigkeiten von inner- und intrapsychischen Krisen einen Grundstein für die gesunde psychische und körperliche Entwicklung und Resilienz im Erwachsenenalter. Zentrale Aspekte der Persönlichkeitsfunktionen umfassen basale Fähigkeiten sowohl in Bezug auf das Selbst u. a. in den Dimensionen Selbstwahrnehmung und Selbstregulation, als auch mit Bezug auf andere – also im Sinne interpersonellen Verhaltens – u. a. in den Dimensionen Emotionale Kommunikation (Empathie) und Bindung. Störungen in Form von belastenden Kindheitserfahrungen können diese Entwicklung langfristig negativ beeinflussen, womit ihnen eine Prädisposition für spätere Pathologien innewohnt. Mit der Aufnahme ins DSM-5 und ICD-11 gewannen die Persönlichkeitsfunktionen als transdiagnostisches Konstrukt in den letzten Jahren zunehmend an Bedeutung, insbesondere im Zusammenhang mit psychischen Störungen. Die Habilitationsschrift liefert den Beitrag einer empirischen Untersuchung dieser noch immer überwiegend theoretisch und klinisch fundierten Konstrukte. Durch die Validierung und Normierung an repräsentativen Bevölkerungsdaten liegen mit dem OPD-SFK und dem MZQ erstmals Instrumente vor, die Rückschlüsse auf Aspekte der Persönlichkeitsfunktionen wie das Strukturniveau (OPD-SFK) und die Mentalisierungsfähigkeit (MZQ) erlauben und ökonomisch und reliabel in Forschung und Klinik Anwendung finden können.

Damit war es möglich zu zeigen, dass Zusammenhänge zwischen belastenden Kindheitserfahrungen und psychischen Störungen signifikant mit den Persönlichkeitsfunktionen assoziiert sind. So fanden sich medierende Effekte des Strukturniveaus bei hochprävalenten psychischen Belastungen wie Depressivitäts- und Angstsymptomen oder auch weniger prävalenten, dafür jedoch umso belastenderen und risikobehafteten Symptomen, wie denen der PTBS und kPTBS sowie Phänomenen wie nicht-suizidalen Selbstverletzungen und Suizidversuchen. Dabei waren höhere Beeinträchtigungen des Strukturniveaus mit höheren Belastungen assoziiert. Bei spezifisch traumaassoziierten Phänomenen wie der Dissoziation wurde schon lange diskutiert, dass schwer belastende Kindheitserfahrungen so intensiv schädigende Ereignisse darstellen, dass sie

schwerste Beeinträchtigungen des Strukturniveaus bedingen und damit auch die dissoziative Symptomatik. Die Annahme, dass hier insbesondere Mentalisierungsschwächen mit den Zusammenhängen zwischen belastenden Kindheitserfahrungen und der dissoziativen Symptomatik assoziiert sind, konnte im Rahmen der Habilitation erstmals gezeigt werden. Darüber hinaus wurde das relativ neue transdiagnostische Konstrukt des epistemischen Vertrauens näher betrachtet. Hier konnte gezeigt werden, dass sowohl das Strukturniveau als auch das epistemische Vertrauen relevante Mediatoren für den Zusammenhang zwischen belastenden Kindheitserfahrungen und PTBS bzw. kPTBS darstellen, wobei insbesondere dem epistemischen Vertrauen eine bedeutsame Rolle zukommt.

Obwohl sich das Strukturniveau im Laufe des Lebens konsolidiert und im Allgemeinen als eine Summe stabiler, anlagebedingter mentaler Fähigkeiten betrachtet wird, finden sich vielfach Belege, dass diese durch hilfreiche Erfahrungen z. B. im Rahmen psychotherapeutischer Behandlungen positiv beeinflusst werden können. Es erfolgten daher Untersuchungen klinischer Stichproben, in denen beispielsweise für Patient:innen in psychosomatischer Rehabilitationsbehandlung gezeigt werden konnte, dass die Mentalisierungsfähigkeit einen potenziell kritischen Erfolgsfaktor für Symptomverbesserungen während der Rehabilitation darstellt und dass eine der Kernkomponenten zur Verbesserung der Mentalisierungsfähigkeit eine Reduktion des epistemischen Misstrauens war.

Die Relevanz der Persönlichkeitsfunktionen für chronische körperliche Erkrankungen wurde am Beispiel Diabetes mellitus veranschaulicht. Auch hier konnte erstmals gezeigt werden, dass der Zusammenhang zwischen belastenden Kindheitserfahrungen und Diabetes mit Beeinträchtigungen des Strukturniveaus verbunden ist. Gleichzeitig scheint das Strukturniveau assoziiert mit dem Zusammenhang von belastenden Kindheitserfahrungen und dem deutlich gehäuften Auftreten extrem belastender suizidaler Gedanken. Dies betont einmal mehr die in den letzten Jahren für den Umgang mit dem Diabetes zunehmend an Beachtung gewinnenden psychischen und psychosozialen Faktoren. Dass es zielführend sein kann, bei Patient:innen mit Diabetes und psychosozialen Belastungen, die über Standardangebote wie DMPs oder Diabetesschulungen nicht ausreichend erreicht werden, psychotherapeutische Angebote zu etablieren, die nicht nur gezielt die diabetesbezogenen und damit spezifischen Belastungen adressieren, sondern auch das Strukturniveau berücksichtigen, konnte ein RCT zeigen. Die psy-PAD-Studie umfasste einen integrierten psychodynamisch orientierten psychotherapeutischen Behandlungsansatz, der die Reduktion von diabetesbezogenen Belastungen fokussierte und gleichzeitig das Strukturniveau berücksichtigte. Es konnte gezeigt werden, dass ein solcher Behandlungsansatz nicht nur die psychischen und diabetesbezogenen psychosozialen Belastungen

reduziert, sondern auch die Stoffwechseleinstellung verbessert werden können. Zukünftige und aktuelle Studienvorhaben verfolgen diesen Ansatz weiter. Mit neuen Projekten wie der Ed-iPP-Studie, in welcher diabetesbezogene Belastungen aus der subjektiven Perspektive von Patient:innen mit Diabetes erfasst werden sollen, oder auch der DFG-geförderten minDBe-Studie, bei der die psy-PAD-Intervention an ein Gruppensetting adaptiert und als neues Versorgungsangebot in die kürzlich gegründeten psychosomatischen Institutsambulanzen (PsIA) implementiert werden soll, wird die Forschung und klinische Erprobung auch in den nächsten Jahren weiter vorangetrieben.

Der aktuelle Forschungsstand kann nur ein Anfang sein, um zugrundeliegende pathogene Mechanismen im Zusammenspiel von belastenden Kindheitserfahrungen mit psychischen Störungen und chronischen körperlichen Erkrankungen wie dem Diabetes besser zu verstehen. Die hier überwiegend vorliegenden Querschnittsuntersuchungen unterliegen einer Reihe methodischer Einschränkungen, die keine Kausalschlüsse zulassen. Longitudinale Studien sind notwendig, um neben assoziativen auch kausale Zusammenhänge nachzuweisen. Gleichzeitig bedarf es genauerer Betrachtungen der untersuchten Konstrukte, um besser verstehen zu lernen, wie genau diese sich störungs- und erkrankungsspezifisch auswirken. Neue Konstrukte wie das epistemische Vertrauen benötigen weithin Berücksichtigung in der klinischen Forschung, aber auch Praxis. Während mit der mentalisierungsbasierten und der strukturbezogenen Psychotherapie bereits spezifische Therapieangebote vorliegen, müssen Ansätze, die das epistemische Vertrauen fokussieren, erst noch entwickelt und die Relevanz des Konstruktes in verschiedenen psychotherapeutischen Settings untersucht werden. Erste Vorhaben hierhingehend sind bereits angelaufen oder befinden sich in Vorbereitung. Dabei sollten mit Blick auf die Bedeutsamkeit der Persönlichkeitsfunktionen zukünftig auch chronische körperliche Erkrankungen mehr in den Fokus genommen werden, insbesondere, aber eben nicht ausschließlich dann, wenn komorbide Psychopathologien vorliegen. Jedoch auch in der Abwesenheit einer diagnostizierbaren psychischen Störung sollte das Risiko eines durch beeinträchtigte Persönlichkeitsfunktionen gestörten Gesundheitsverhaltens in der Risikogruppe von Menschen mit belastenden Kindheitserfahrungen und chronischen körperlichen Erkrankungen stärker bedacht werden.

4. ORIGINALARBEITEN

Im Folgenden finden sich die der Habilitationsschrift zugrundeliegenden Originalarbeiten. Die Reihung erfolgt entsprechend der Nennung im Text und nicht chronologisch.

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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

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Background: The assessment of personality functioning is at the core of current dimensional models of personality disorders. A variety of measures from different clinical and research traditions aim to assess basic psychological capacities regarding the self and others. While some instruments have shown reliability and validity in clinical or other selected samples, much less is known about their performance in the general population.

Methods: In three samples representative of the German adult population with a total of 7,256 participants, levels of personality functioning were measured with the short 12-item version of the Operationalized Psychodynamic Diagnosis – Structure Questionnaire (OPD-SQS). We addressed questions of factor structure, reliability, validity, factorial invariance, and provide norm values.

Results: Confirmatory factor analysis indicated a satisfactory to good model fit. OPD-SQS models were mostly unaffected by variables such as gender, age, or measurement time. As expected, personality functioning was associated with general psychopathology as well as indices of occupational functioning.

Conclusion: The OPD-SQS is a viable measure to assess personality functioning in the general population.

KEYWORDS

personality functioning, OPD-SQS, personality disorders, assessment, norm values, validity

1. Introduction

Measuring severity of personality disorders (PD) through levels of personality functioning has attracted researchers and clinicians alike. From a clinical perspective, it enables treatment-planning on a personalized profile of abilities and personality styles rather than on categorical diagnosis (Morey and Hopwood, 2020). From a research-perspective, it solves several issues related to variance and distributions, cut-off values, comorbidity, and unspecific residual categories. However, there are a number of challenges associated with this approach as well, some of them on a conceptual level, others in relation to a lack of empirical data. While the number of studies in clinical populations is growing, less is known about the measurement of personality functioning in the general population.

The DSM-5 Alternative Model for the Assessment of Personality Disorders [AMPD; (Morey et al., 2011)] and the revision of the related chapter of the ICD-11 (Tyrer et al., 2011) have proposed a hybrid model for diagnosing PDs. Both approaches include a dimensional rating of basic psychological capacities as a stand-alone-measure as well as a prerequisite for further differentiation by clinical five-factor variables and PD prototypes (Tyrer et al., 2019). At the core of each model is a dimensional rating of severity of personality dysfunction, which has a twofold purpose: on the one hand, it serves as a general indicator of the level of capabilities in basic psychological functioning, and therefore helps to translate clinical phenomena into a measure of impairment, including cut-off scores for the presence or absence of a PD in the sense of categorical diagnosis. On the other hand, it includes clinically relevant information in itself, as DSM-5 and ICD-11 approaches define personality functioning as a combination of a number of capacities with regard to the self and interpersonal processes, which can inform treatment planning and evaluation. Since the initial publications, both DSM-5 AMPD as well as ICD-11 PD have stimulated a considerable amount of research (Zimmermann et al., 2019; Bach and Anderson, 2020; Krueger and Hobbs, 2020; Rek et al., 2020). In addition to measures specifically designed to capture dimensions of the DSM-5 and ICD-11, there are a number of approaches that assess similar constructs. One of those approaches is based on the Operationalized Psychodynamic Diagnosis system (OPD).

The OPD was initially developed by a group of researcher-clinicians from psychiatry, psychosomatic medicine, and clinical psychology in the beginning of the 1990s (Task Force, 2008; Arbeitskreis zur Operationalisierung Psychodynamischer Diagnostik, 2014). Its second edition (OPD-2) on which the questionnaire of the current study is based, is a multiaxial system to supplement psychiatric symptom-oriented diagnosis (OPD-2 Axis V) by adding treatment-relevant information in the areas of experience of illness and prerequisites for treatment (Axis I), interpersonal relations (Axis II), intrapsychic motivational conflicts (Axis III), and personality functioning, which has been labeled as 'structure' (Axis IV) in the OPD (Wöller and Kruse, 2018). The clinical model focuses on interrelations between axis II, axis III, and axis IV. Repetitive maladaptive interpersonal patterns are either based on conflictual insecure core motives which translate into ambivalent relationships that include motive-related wishes as well as a 'defense' against these wishes, or on impairments in personality functioning that complicate relationships on a basic level, or on a combination of both (Schauenburg and Grande, 2012; Ehrenthal and

Benecke, 2019). "Structure" according to the OPD-2 operationalizes personality functioning by means of Levels of Structural Integration (LSIA).

The OPD-2 defines 'structure' as basic psychological capacities that are necessary for an adaptive organization of the self and its relation to internal and external 'objects', i.e., self and interpersonal functioning (Arbeitskreis zur Operationalisierung Psychodynamischer Diagnostik, 2014). The OPD-2 LSIA follows several principles: 1. It has a developmental focus and assesses functioning that is usually acquired in normal development but impaired due to disadvantageous conditions often related to neglect and abuse. 2. It assesses functioning with regard to abilities, not necessarily concerning specific behavioral consequences *per se*. In other words, it focuses on tools and skills, which result in a higher or lower probability for achieving adaptive behavior. 3. It tries to be as descriptive as possible, stepping back from wording directly associated with specific psychodynamic or other therapy schools. 4. Every facet is formulated as a possible direct treatment target that can be communicated with patients as shared goals.

'Structure' is observed in four different areas that relate to capacities of cognition/perception, regulation, communication, and attachment, each with regard to the self and others, resulting in eight broad structural functions. Every one of those consists of three subdimensions or facets: for example, 'self-perception' comprises capacities of self-reflection, affect differentiation, and identity, while 'regulation of relationships' is composed of capacities for protecting relationships, balancing interests, and anticipation [for a full description, see for example (Ehrenthal and Benecke, 2019)]. Each of these facets and dimensions is rated on a four-point scale from high integration (rating of 1), via medium (rating of 2) and low (rating of 3) levels of integration, to disintegration (rating of 4), resulting in an overall score of structural integration. These ratings can be further differentiated by intermediate steps. Usually, a score of 2.5 or 3 indicates a predominant structural impairment of personality functioning. Ratings are based on a semi-structured interview as conducted in routine clinical practice.

Interview-based ratings of the OPD LSIA show generally good inter-rater reliability, convergent validity, and construct validity (Zimmermann et al., 2012; Ehrenthal and Benecke, 2019). In 2012, Ehrenthal and colleagues (Ehrenthal et al., 2012) published a self-report questionnaire to complementarily assess personality functioning from the patients' perspective (OPD-Structure Questionnaire; OPD-SQ). Its full version correlates significantly with expert ratings of the LSIA ($r=0.62$), and explains variance in the prediction of the number of DSM-IV SCID-II personality disorder diagnoses incrementally to the expert ratings (Dinger et al., 2014). It is associated with attachment insecurity and neuroticism, and differentiates between individuals currently not in psychotherapy treatment, patients in outpatient treatment, and patients in inpatient psychotherapy, even if statistically controlled for influences of general symptom load (Ehrenthal et al., 2012). It is also related to burnout in students (Bugaj et al., 2016), PTSD symptom severity (Baie et al., 2020), or other self-report measures of personality functioning in adults (König et al., 2016) and adolescents (Bock et al., 2018). Patients with borderline personality disorder (BPD) and comorbid depression had higher scores in the OPD-SQ than patients with depression alone (Köhling et al., 2016). Higher scores of the OPD-SQ but not a

categorical diagnosis of BPD were associated with active negative emotions in psychotherapy inpatients (Dinger et al., 2021). OPD-SQ scores but not depression predicted less success in blood glucose normalization in the treatment of patients with type 2 diabetes mellitus (Ehrenthal et al., 2019), and could be related to gastrointestinal complaints (Berens et al., 2021) and irritable bowel syndrome (Berens et al., 2021), profiles of eating disorders (Rohde et al., 2019), bipolar disorder (Wagner-Skacel et al., 2020), vaginismus and dyspareunia (Koops et al., 2021), and has been applied in different areas of psychotherapy research (Ehrenthal et al., 2020; Nikendei et al., 2020; Zeeck et al., 2020; Knefel et al., 2021; Kraus et al., 2021; Immel et al., 2022). In addition, the OPD-SQ is highly correlated with state and trait measures of emotional intelligence as well as self-reported levels of personality functioning according to the DSM-5 (Jauk and Ehrenthal, 2021), and it mediates the association between childhood trauma and adult depression (Dagnino et al., 2020). The OPD-SQ can also be used as an item pool for computer adaptive testing (Obbarius et al., 2021).

A 12-item short version (OPD-SQS) was developed by Ehrenthal and colleagues (Ehrenthal et al., 2015). It comprises three highly correlated subscales that address abilities around the topics of self-perception, shaping contact, and key relationship models. In the initial validation study, reported fit indices of the model were acceptable to good [TLI = 0.93; CFI = 0.95; RMSEA (90% CI) = 0.10 (0.09–0.11)]. Patients with higher scores in the OPD-SQS reported more previous psychotherapeutic and psychiatric treatment, independent of general symptom load (Ehrenthal et al., 2015). The OPD-SQS correlates with an interview-based assessment of DSM-5 LPFS [$r = 0.78$; (Zettl et al., 2019)], impaired reflective functioning (Zettl et al., 2020), and other convergent measures of severity of personality problems (Obbarius et al., 2019; Zimmermann et al., 2020). OPD-SQS scores partially mediate the association between adverse childhood experiences and health-related variables such as distress, experience of somatic symptoms, and body dysmorphic concerns (Krakau et al., 2021), and have been used in other areas of clinical psychology and health psychology (Ernst et al., 2022; Graetz et al., 2022; Vierl et al., 2022; Bröcker et al., 2023; Ernst et al., 2023; Zara et al., 2023).

While research on DSM-5 and ICD-11 personality functioning and related constructs such as the OPD has flourished in clinical samples as well as easy-to-access convenience samples, much less is known about the general population. In fact, Zimmermann and colleagues (Zimmermann et al., 2019) demanded that "... representative samples from the general population should be collected to establish normative values, which will greatly enhance the interpretation of test scores in single-case scenarios." In accordance with this task, we present representative norm values of the German adult population of a common instrument to assess personality functioning: the OPD-SQS (Ehrenthal et al., 2015). In addition, we tested several models to replicate and expand previous findings on factorial validity and reliability. Furthermore, we addressed measurement invariance with regard to gender,¹ measurement year, and age group. Finally, we aimed at replicating associations with

general psychopathology as well as relationships with occupational functioning, the latter operationalized as unemployment frequency, personal income, and household income, and possible interaction effects of general psychopathology and personality functioning on occupational functioning.

2. Methods

2.1. Participants and procedure

The studies were not formally preregistered. The present representative study samples were collected in the years 2013, 2016, and 2019 by the demographic consulting company USUMA by order of the University of Leipzig. Sample size per study was determined by the usual procedure of the company. A total of $N = 7,549$ participants was collected using a multistage sampling method based on electoral districts, households, and persons in the household. Households were selected via random route procedure, and household members were selected using the Kish selection grid. This procedure aimed at obtaining a representative sample of the German population in terms of sex, age, and education. We confirmed this by comparing the distributions with data provided by the Federal Statistical Office of Germany (Statistisches Bundesamt, Bevölkerung, 2019). Descriptive statistics are reported in Table 1. Only participants with sufficient German language skills and an age of 18 or older were included. All participants were interviewed face-to-face by an USUMA employee, who assessed their language skills prior to the interview, which also served as a data validity check. Prior to participating, all participants were informed of the investigation's general purpose and procedure and that data storage would be anonymized. In addition, they received a detailed data protection statement. The study included questionnaires assessing mental well-being of respondents. However, since no medical or psychological interventions were applied, there was no risk involved for participants. In accordance with German law, all participants provided verbal informed consent. Additionally, the studies followed the ICC/ESOMAR International Code of Marketing and Social Research Practice. After being informed of the general purpose of the survey, participants filled out the questionnaires mentioned below.

In the current study, there were some missing data for the OPD-SQS. Due to the large samples as well as prerequisites of some of the conducted analyses, we only included individuals with complete data regarding the OPD-SQS. This resulted in an exclusion of 293 individuals,² leaving 7,256 cases to be analyzed.

2.2. Instruments

2.2.1. Personality functioning

The OPD-SQS (Ehrenthal et al., 2015) is a 12-item version of the OPD-Structure Questionnaire (Ehrenthal et al., 2012) described

¹ As the assessment procedure did not take into account various aspects of gender, we can only conduct analyses to a binary male–female version of gender.

² To be more precise, of 90,588 (12 items x 7,549 participants) possible values of the OPD-SQS, less than 1% (658) were missing, which led to the abovementioned exclusion of less than 1% of the initial participants.

TABLE 1 Sociodemographic data of the samples.

	Total		2013		2016		2019	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
	7,256	100.0	2,449	100.0	2,434	100.0	2,373	100.0
Sex								
Male	3,397	46.8	1,146	46.8	1,140	46.8	1,111	46.8
Female	3,859	53.2	1,303	53.2	1,294	53.2	1,262	53.2
Age groups								
<30	1,330	18.3	443	18.1	455	18.7	432	18.2
30–39	1,079	14.9	326	13.3	386	15.9	367	15.5
40–49	1,228	16.9	444	18.1	392	16.1	392	16.5
50–59	1,412	19.5	454	18.5	480	19.7	478	20.1
60–69	1,171	16.1	381	15.6	386	15.9	404	17.0
>69	1,036	14.3	401	16.4	335	13.8	300	12.6
Family								
Married	3,177	43.8	1,083	44.2	1,061	43.6	1,033	43.5
Separated	182	2.5	62	2.5	52	2.1	68	2.9
Unmarried	2,164	29.8	695	28.4	757	31.1	712	30.0
Divorced	1,026	14.1	343	14.0	341	14.0	342	14.4
Widowed	687	9.5	266	10.9	214	8.8	207	8.7
Missing values	20	0.3	0	0.0	9	0.4	11	0.5
Work								
Fulltime	3,099	42.7	980	40.0	1,047	43.0	1,072	45.2
Part time	977	13.5	304	12.4	333	13.7	340	14.3
Unemployed	670	9.2	262	10.7	229	9.4	179	7.5
Retired	1,902	26.2	713	29.1	613	25.2	576	24.3
In training	587	8.1	190	7.8	193	7.9	204	8.6
Missing values	21	0.3	0	0.0	19	0.8	2	0.1
Education								
<10 years	2,401	33.1	914	37.3	787	32.3	700	29.5
10 years	2,817	38.8	916	37.4	939	38.6	962	40.5
>11 years	1,800	24.8	532	21.7	630	25.9	638	26.9
Current student	218	3.0	77	3.1	72	3.0	69	2.9
Missing values	20	0.3	10	0.4	6	0.2	4	0.2

above. Individuals respond to each question on a scale from 0 (“fully disagree”) to 4 (“fully agree”). Different from the full version, where mean values are computed, the OPD-SQS uses a sum score for an easier use in clinical settings, resulting in a range of possible values from 0 to 48. Higher numbers indicate more impairment in personality functioning. In addition, three subscales (self-perception, shaping contact, and relationship model) with four items each can be computed. Findings on reliability and validity are cited above.

2.2.2. General psychopathology

The PHQ-4 (Löwe et al., 2010) is a very brief measure of depression and anxiety derived from the depression and anxiety scales of the Patient Health Questionnaire (Kroenke et al., 2009), which is often used to assess general levels of common psychopathology. Two items on depression and two items on anxiety are scored on a scale

from 0 (“not at all”) to 3 (“nearly every day”), resulting in a range for the sum score from 0 to 12. Higher numbers indicate more depressive and anxiety symptoms. The PHQ-4 is widely used as a screening measure or in representative samples as an assessment of common psychopathology. In addition, it has been associated with symptoms related to impaired personality functioning such as self-harm (Müller et al., 2016) or adverse childhood experiences (Schilling et al., 2016). In our study, ω for the PHQ-4 was 0.874 across all samples.

2.2.3. Occupational functioning

A predominantly occupational aspect of psychosocial functioning was assessed by reported unemployment frequency (“How often have you been unemployed including current unemployment?”), personal income (13 groups in total, ascending in predefined steps from no personal income to 5,000 Euro and more), and household income

(following the same ascending logic from under 500 Euro to 5,000 Euro and more). Both income variables were assessed as they seem to be related to psychosocial functioning in personality disorders in the long term (Skodol, 2018).

2.3. Statistical analyses

All analyses were conducted in R, using the packages *lavaan* and *semTools* (Rosseel, 2012; Jorgensen et al., 2020). First, we conducted confirmatory factor analyses for all three subsamples separately and jointly. Since the response data exhibits a strong right-skew, we used robust diagonally weighted least squares estimation and theta parameterization [WLSMV in *lavaan* (Li, 2016)]. We then judged the closeness of model fit based on the common recommendations (Hu and Bentler, 1999; Schermelleh-Engel et al., 2003): χ^2 should be non-significant, *CFI* and *TLI* should be greater than 0.950, and *RMSEA* and *SRMR* should be smaller than 0.080. We investigated reliability using McDonald's ω (McDonald, 1999). Because of the ordered categorical data assumption, we used Green and Yang's formula to estimate the coefficient (Green and Yang, 2009). Next, we tested for measurement invariance to ensure the comparability of observed groups between sexes, age groups, and measurement points (Meredith, 1993). Some modifications to the typical procedure have to be made to account for the ordinal data structure (Millsap and Yun-Tein, 2004; Wu and Estabrook, 2016). That is, intercepts are fixed to zero in all groups for identification purposes, and one instead checks the invariance of thresholds across groups. The successive constraint levels, thus, refer to item thresholds, factor loadings, and residual variances. Chen (2007) provides cut-off values for these nested model comparisons: $\Delta\chi^2$ should be non-significant, ΔCFI should be ≤ 0.010 , and $\Delta RMSEA$ should be ≤ 0.015 . We conducted ordered logistic regression analyses for associations between OPD-SQS, PHQ-4, and their interaction on the one, and unemployment frequency, personal income, and household income using the R package MASS (Venables and Ripley, 2010). We report Nagelkerke's R^2 as a measure of effect size for the related models. We report how we determined our sample size, all data exclusions (if any), and all manipulations. As the USUMA studies usually comprise a variety of instruments per measurement point, we can only report the measures of interest for this study.

3. Results

3.1. Item descriptive analyses

As can be seen from the descriptive item parameters reported in Table 2, all of the OPD-SQS's items have positive skewness. This means that the majority of participants responded with low values (such as 0 or 1), and a smaller number of participants responded with options in the middle or the upper extreme of the scale.

3.2. Confirmatory factor analysis

Using the procedure described in the method section, we then tested the OPD-SQS's factorial validity. As can be seen in Table 3,

model fit was acceptable in all three samples. The χ^2 test was significant in all cases, and the descriptive measures of fit were in an acceptable range. *CFI* never fell below 0.950, and *TLI* was only marginally below the threshold in one sample. *SRMR* evinced good fit with values around 0.050. *RMSEA* fell slightly above the 0.080 cut-off value in two samples and clearly above it in the third sample. Overall, fit measures indicated acceptable fit. Standardized factor loadings are reported in Table 2 for all three samples. Most loadings exceeded 0.70, indicating strong discrimination at the trait level. Across the board, ω had very good values considering the brevity of the three scales: not a single ω coefficient was below 0.800.

To justify the construction of a total scale score, we also tested a bi-factor model (Reise et al., 2007; Chen et al., 2012) for the OPD-SQS across the combined sample. This model showed a further improved fit, χ^2 (Obbarius et al., 2019) = 1370.865, $p < 0.001$, *CFI* = 0.985, *TLI* = 0.977, *RMSEA* = 0.066, *SRMR* = 0.030. The $\omega_{\text{hierarchical}}$ coefficient of 0.834 indicated that the majority of the OPD-SQS's variance can be traced to a general factor.

In addition, we computed a second-order factor model in which the subscale factors of the OPD-SQS load on a higher order general factor. This model fit was slightly worse than the bi-factor model, but was still acceptable with regard to three out of the four employed descriptive fit indices, χ^2 (Löwe et al., 2010) = 3214.042, $p < 0.001$, *CFI* = 0.965, *TLI* = 0.955, *RMSEA* = 0.092, *SRMR* = 0.046. Reliability of the second order construct was $\omega = 0.870$ at the first level, and 0.925 at the second level. The former of the two coefficients represents the proportion of total variance explained by the general factor in the model-implied covariance matrix.

3.3. Measurement invariance and group-specific differences of the OPD-SQS

We then tested the OPD-SQS' three-factor model for measurement invariance across measurement years, age groups, and participant sex.³ As can be seen in Table 4, ΔCFI and $\Delta RMSEA$ never exceeded their respective cut-offs. Thus, we accept the measurement process for the OPD-SQS's model to be invariant across the three aforementioned grouping variables.

Given invariance, we then checked for differences in observed OPD-SQS sum scores across the three grouping variables (see Table 5). Eight out of nine *F* tests were significant, but this is not surprising given the very large sample size. As can be seen with the proportions of systematic variance η^2 , only participant sex explained more than 1%, and only for the 'self' subscale. Overall, the OPD-SQS scores were thus largely unaffected by participant sex, age, and measurement time.

3.4. Convergent validity

We report latent and observed correlations among the OPD-SQS subscales and between the OPD-SQS and the PHQ-4

³ As mentioned above, we can only conduct analysis with regard to a binary (male–female) variant of gender, which we use the word 'sex' for on a level of operationalization to describe a binary self-attribution by the participants.

TABLE 2 Descriptive statistics for OPD-SQS items and scales.

	Items	<i>Md</i>	<i>M</i>	<i>SD</i>	Skewness	Kurtosis	λ 2013	ω 2013	λ 2016	ω 2016	λ 2019	ω 2019
OPD-SQS Total		11	11.69	8.35	0.70	3.21		0.92		0.92		0.93
OPD-SQS self		1	2.09	2.86	1.59	5.22		0.88		0.86		0.89
OPD01	<i>I sometimes feel like a stranger to myself.</i>	0	0.41	0.76	1.99	6.72	0.87		0.85		0.88	
OPD02	<i>If I think too much about myself, I tend to get confused.</i>	0	0.51	0.85	1.68	5.24	0.86		0.85		0.87	
OPD05	<i>There is often such a chaos of feelings inside me that I could not even describe it.</i>	0	0.60	0.91	1.54	4.74	0.89		0.88		0.89	
OPD08	<i>Sometimes my feelings are so intense that I get scared.</i>	0	0.57	0.87	1.54	4.89	0.81		0.82		0.84	
OPD-SQS contact		3	3.75	3.17	0.75	3.05		0.81		0.80		0.80
OPD04	<i>I find it difficult to make others understand me.</i>	1	0.82	0.96	1.00	3.24	0.80		0.80		0.85	
OPD06	<i>I sometimes misjudge how my behavior affects others.</i>	1	1.12	1.04	0.56	2.45	0.76		0.77		0.82	
OPD10	<i>I find it hard to get in contact with other people.</i>	1	0.81	0.97	1.02	3.28	0.75		0.75		0.67	
OPD11	<i>I do not have good self-esteem.</i>	1	1.00	1.13	0.90	2.85	0.69		0.69		0.67	
OPD-SQS relationship model		6	5.85	3.72	0.26	2.46		0.82		0.83		0.82
OPD03	<i>It can be dangerous to let others get too close to you.</i>	1	1.22	1.12	0.52	2.39	0.72		0.77		0.79	
OPD07	<i>If others know a lot about me I often feel somehow controlled or observed.</i>	1	1.16	1.11	0.59	2.42	0.80		0.78		0.84	
OPD09	<i>I've been hurt badly because I misjudged someone.</i>	2	1.63	1.30	0.25	1.95	0.72		0.77		0.75	
OPD12	<i>My experience is: if you trust people too much you can get nasty surprises.</i>	2	1.84	1.15	0.06	2.36	0.75		0.77		0.67	

OPD-SQS, short form of the Operationalized Psychodynamic Diagnosis Structure Questionnaire; *Md*, median; *M*, mean; *SD*, standard Deviation; λ , standardized factor loading in confirmatory factor analysis; ω = reliability coefficient omega.

TABLE 3 Confirmatory factor analysis of the OPD-SQS.

Sample	χ^2	df	p	CFI	TLI	RMSEA	SRMR
2013	992.847	51	<0.001	0.968	0.958	0.087	0.043
2016	938.162	51	<0.001	0.969	0.960	0.085	0.047
2019	1549.954	51	<0.001	0.955	0.941	0.111	0.053

OPD-SQS, short form of the Operationalized Psychodynamic Diagnosis Structure Questionnaire.

TABLE 4 Test of measurement invariance of the OPD-SQS.

	χ^2	df	$\Delta\chi^2$	Δdf	p	CFI	ΔCFI	RMSEA	$\Delta RMSEA$
Time									
Configural invariance	3447.714	153				0.964		0.094	
Threshold invariance	3665.362	201	217.648	48	<0.001	0.962	−0.002	0.084	−0.010
Threshold + loading invariance	3568.768	219	−96.593	18	<0.001	0.963	0.001	0.080	−0.005
Threshold + Loading + residual invariance	3367.169	243	−201.599	24	<0.001	0.966	0.002	0.073	−0.007
Sex									
Configural invariance	3290.396	102				0.965		0.093	
Threshold invariance	3486.338	126	195.942	24	<0.001	0.963	−0.002	0.086	−0.007
Threshold + loading invariance	3276.050	135	−210.289	9	<0.001	0.966	0.002	0.080	−0.006
Threshold + loading + residual invariance	2943.815	147	−332.235	12	<0.001	0.969	0.004	0.072	−0.008
Age groups									
Configural invariance	3376.990	306				0.967		0.091	
Threshold invariance	3560.937	426	183.947	120	<0.001	0.966	−0.001	0.078	−0.013
Threshold + loading invariance	3213.243	471	−347.694	45	<0.001	0.970	0.004	0.069	−0.009
Threshold + loading + residual invariance	2830.033	531	−383.209	60	<0.001	0.975	0.005	0.060	−0.010

OPD-SQS, short form of the Operationalized Psychodynamic Diagnosis Structure Questionnaire.

TABLE 5 ANOVA table of the OPD-SQS subscales.

	F	df1	df2	p	η^2
Total score					
Time	42.844	2	7,253	<0.001	0.012
Sex	69.602	1	7,254	<0.001	0.010
Age groups	1.756	5	7,250	0.118	0.001
Self					
Time	30.951	2	7,253	<0.001	0.008
Sex	80.784	1	7,254	<0.001	0.011
Age groups	7.927	5	7,250	<0.001	0.005
Contact					
Time	42.346	2	7,253	<0.001	0.012
Sex	29.827	1	7,254	<0.001	0.004
Age groups	2.632	5	7,250	0.022	0.002
Relationship model					
Time	26.284	2	7,253	<0.001	0.007
Sex	51.41	1	7,254	<0.001	0.007
Age groups	0.381	5	7,250	0.862	0

OPD-SQS, short form of the Operationalized Psychodynamic Diagnosis Structure Questionnaire.

(see Table 6). Latent and observed correlations between the subscales were very high ($r \geq 0.677$ and 0.503, respectively). Considering the PHQ-4 as a related measure of psychopathology, all subscales showed the expected pattern of moderate to strong associations.

3.5. Norm values

Finally, we report Table 7 with normative percentile values for the OPD-SQS's subscales and the total score. Since sociodemographic variables and time of measurement had only negligible impact on the sum scores, we did not stratify the norm values in any way.

3.6. Occupational functioning

Number of unemployment times was not assessed in the 2016 survey. In all available samples, PHQ-4 as well as OPD-SQS, but not their interaction, were significantly associated with a higher probability for a higher unemployment frequency, and with a lower probability for lower personal as well as household income, with generally small effects (see Table 8).

TABLE 6 Correlation matrix of the OPD-SQS and the PHQ-4.

	OPD-SQS self	OPD-SQS contact	OPD-SQS relationship model	OPD-SQS G*	PHQ-4
OPD-SQS self	1	0.677	0.503	0.822	0.552
OPD-SQS contact	0.868	1	0.629	0.891	0.482
OPD-SQS relationship model	0.681	0.820	1	0.856	0.376
OPD-SQS G*	0.893	0.984	0.796	1	0.539
PHQ-4	0.581	0.535	0.434	0.584	1

Observed correlations are above the diagonal, latent correlations are below the diagonal. *Latent correlations regarding the G factor stem from the second-order factor model. OPD-SQS, short form of the Operationalized Psychodynamic Diagnosis Structure Questionnaire. PHQ-4, four item version of the Patient Health Questionnaire.

4. Discussion

In three samples representative of the German adult population with more than 7,000 participants, we found a 12-item self-report measure of personality functioning to be mostly independent of gender, age and assessment year. OPD-SQS scores were associated with general common psychopathology as well as indices of occupational functioning.

The results of reliability and confirmatory factor analyses closely resemble results from previously published studies. Internal consistency was high in the original evaluation in a mixed as well as a clinical sample [Cronbach's $\alpha = 0.87$ – 0.89 ; (Ehrenthal et al., 2015)], a Danish college counseling sample [$\alpha = 0.85$; (Østergård et al., 2019)], a mixed clinical and control sample [$\alpha = 0.92$; (Zettl et al., 2020)], and a clinical sample [$\alpha = 0.88$ – 0.89 ; (Obbarius et al., 2019)]. Across studies and samples, the OPD-SQS seems to be of robust acceptable to high internal consistency. The same applies for the CFA, which is also within the range of the original evaluation (Ehrenthal et al., 2015) and the data from Obbarius and colleagues (Obbarius et al., 2019). Similar to Obbarius et al., fit indices improved when testing a bifactorial model. Taken together, our results add to the stability of a general factor resulting from three interrelated facets. We also found that this was largely unaffected by variables such as age, gender, or the year of our measurement points. Therefore, the scores can be reasonably compared for inferences with relation to the theorized constructs.

Correlations with general common psychopathology were high. To our knowledge, there is no published study that did not find similar associations. This confirms OPD-SQS personality functioning as a substantial statistical predictor of psychological distress. Previous studies found the OPD-SQ and OPD-SQS to be associated to other variables such as attachment, personality, and mentalization even when statistically controlling for the effect of general psychopathology (Ehrenthal et al., 2012, 2015; Zettl et al., 2020). However, we cannot conclude the direction of the association from the current dataset, and further research with longitudinal designs and intensive measurement is needed to disentangle the shared variance.

Associations with indices of occupational function (i.e., unemployment frequency, personal, and household income) were significant but small. This points toward the importance of personality functioning as a risk factor that limits an individual's options to live up to their full potential. We found no significant interactions between OPD-SQS and PHQ-4, tentatively suggesting several pathways from

what used to be called Axis I and Axis II in the DSM-IV on related variables. Associations between occupational functioning and personality functioning are complex and call for more sophisticated designs and measures that take into account objective as well as subjective measures, and also other areas that go beyond mere occupational functioning, including relational and interpersonal functioning (Frankenburg and Zanarini, 2011; Skodol, 2018; Cruitt and Oltmanns, 2019; Buer Christensen et al., 2020). In addition, other areas such as educational achievement could be of interest for future research. This would need to include other variable such as intelligence. While one study (Bock et al., 2018) did not find a relationship between intelligence and the long version of the OPD-SQ ($r = 0.02$) in a clinical sample of 147 adolescents, this has yet to be replicated in adult samples.

Strengths of this study are the use of a rigorous sampling strategy and the high quality of the data. To our knowledge, this is also the first study using three samples each representative of the respective adult population to address the questions of reliability and validity of the construct of levels of personality functioning. The results are robust and comparable to earlier studies from mixed and clinical samples. In addition, we computed norm values that can be used for comparison and help to classify individuals according to the similarity or deviation of their personal scores on the instrument. Limitations are a cross-sectional design that limits inferences about causality. Even more so, using longitudinal designs that take into account significant personal events would be more suited to test the impact of personality functioning as a vulnerability factor. One might also argue from a methodological perspective that it would be sufficient to test invariance for a general factor and not the three subscales, especially, as the dataset does not allow for more nuanced testing of associations in terms of external validity. However, we wanted to stick with the originally proposed factor model, and would again stress the need for more longitudinal studies. And last, but not least: by using samples representative of the German adult population, we do include individuals with higher as well as lower levels of personality functioning, of which some may even be in psychotherapeutic or psychiatric treatment. Therefore, especially when using it as a reference sample, it is important to keep in mind that it is not a purely non-clinical dataset, but rather one that represents current distributions of psychopathology as one would expect in the general population.

From a clinical perspective, it is important to note that the development of measures from different traditions does not need to be a

TABLE 7 Normative percentile values of the OPD-SQS general scale and subscales.

Sum Score	Normative percentile values OPD-SQS Total	Normative percentile values OPD-SQS "self"	Normative percentile values OPD-SQS "contact"	Normative percentile values OPD-SQS "relationship model"
0	8	46	19	10
1	10	58	30	14
2	14	68	42	22
3	18	76	53	29
4	22	82	63	38
5	26	87	72	47
6	31	90	80	57
7	36	93	86	66
8	41	96	91	76
9	45	97	95	83
10	50	98	97	88
11	54	99	98	93
12	59	99	99	96
13	62	100	100	98
14	66	100	100	99
15	70	100	100	99
16	74	100	100	100
17	77			
18	79			
19	82			
20	84			
21	86			
22	89			
23	90			
24	92			
25	94			
26	95			
27	95			
28	96			
29	97			
30	98			
31	98			
32	98			
33	99			
34	99			
35	99			
36	99			
37	100			

OPD-SQS, short form of the Operationalized Psychodynamic Diagnosis Structure Questionnaire.

disadvantage. Quite the contrary, as personality functioning seems to be captured adequately and largely comparably by a variety of questionnaires and interviews (Wright et al., 2022), it provides clinicians enough freedom to use the construct within their respective intervention

models, which is important for acceptance and dissemination. In addition, first attempts to make these measures comparable have been published as well (Zimmermann et al., 2020; Obbarius et al., 2021). And last, but not least, the third edition of the Operationalized Psychodynamic

TABLE 8 Associations between personality functioning, common psychopathology, and occupational functioning.

		β	SE	t	p	Nagelkerke's R^2
Unemployment frequency	PHQ-4	0.218	0.035	6.21	< 0.001	0.034
	OPD-SQS	0.204	0.032	6.38	< 0.001	
	Interaction	−0.016	0.023	−0.70	0.487	
Personal income	PHQ-4	−0.142	0.026	−5.39	< 0.001	0.036
	OPD-SQS	−0.245	0.024	−10.17	< 0.001	
	Interaction	−0.009	0.017	0.54	0.589	
Household income	PHQ-4	−0.223	0.027	−8.15	<0.001	0.048
	OPD-SQS	−0.218	0.024	−8.98	<0.001	
	Interaction	−0.020	0.017	−1.15	0.249	

OPD-SQS, short form of the Operationalized Psychodynamic Diagnosis Structure Questionnaire; PHQ-4, four item version of the Patient Health Questionnaire; Interaction, PHQ4 * OPD-SQS.

Diagnosis system (OPD-3) has just been published (Arbeitskreis zur Operationalisierung Psychodynamischer Diagnostik, 2023). While some subscales of the LSIA have been altered, most of the core aspects of OPD-2 personality functioning remained in the manual. Due to this continuity as well as the assumption of personality functioning to be a core latent construct which can manifest in different facets, we consider the OPD-SQ and OPD-SQS still similarly valid with regard to the expert rating. Taken together, the OPD-SQS can be considered a robust brief measure to assess personality functioning in the general population.

Data availability statement

Due to the nature of the data collection, the datasets are not published in an open science repository. The datasets with the codes for the statistical analyses can be made available from the first author, upon reasonable request.

Ethics statement

The studies involving humans were approved by the Institutional Review Board of the Medical Faculty of Leipzig University, Leipzig, Germany (050/13-11032013; 297/16ek; Az 145/19-ek). The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

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Author contributions

JE: conceptualization, writing of the original draft, methodology, and data curation. JK: conceptualization and data curation. BS: methodology and statistical analyses. UD, SW, HS, and HK: conceptualization. EB: conceived and designed original surveys. All authors contributed to manuscript revision, read, and approved the submitted version.

Conflict of interest

JE, UD, and HS are authors of the original OPD-SQ and OPD-SQS. The questionnaires are free of charge and these authors declare no commercial or financial relationship that could be construed as a potential conflict of interest.

The remaining authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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4.2. PUBLIKATION II

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Article

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

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Abstract: Deficits in mentalization are indicated by impaired emotional awareness and self-reflectiveness, and are associated with various mental disorders. However, there is a lack of validated research instruments. In this study, the psychometric properties of the Mentalization Questionnaire (MZQ) were evaluated in a representative German population sample with $n = 2487$ participants. Analyses included evaluation of the MZQs acceptance, reliability, and validity. Factorial validity was established with exploratory (EFA) and confirmatory factor analyses (CFA) after the dataset was randomly split. Dimensionality was evaluated with a bi-factor model. For convergent validity, correlations with the OPD SQS, PHQ-4, and POMS were calculated. While acceptance was good, internal consistencies ($\omega = 0.65\text{--}0.79$) and factor structure of the original four subscales were not acceptable ($TLI = 0.87$, $CFI = 0.91$, $RMSEA = 0.071$). EFA indicated a 3-factor solution, which was not confirmed by CFA ($TLI = 0.89$, $CFI = 0.91$, $RMSEA = 0.073$). Correlations between subscales and bi-factor analyses indicated an underlying general factor ($TLI = 0.94$, $CFI = 0.96$, $RMSEA = 0.053$). A shortened 6-item version was comparable to the original scale. Age and sex-specific representative norm-values are presented. The MZQ is a feasible, reliable and valid self-report instrument to measure representations of inner mental states. However, when applied to non-clinical samples, the total score of the MZQ should be used.

Keywords: mentalization; mental disorders; MZQ; norm values; reliability; validity

1. Introduction

Mentalization is a concept introduced by Fonagy, Bateman, Target and colleagues to gain a better understanding—and thereby treatment angle—for patients with borderline personality disorder (BPD), resulting in the development of a specific and effective treatment program called ‘mentalization based treatment’ (MBT) [1–6]. Ever since, mentalization has become relevant not only for BPD but also a variety of other diagnoses [7] such

as depression [8–10], posttraumatic stress disorder [11], psychotic disorders [12–14], drug addiction [15], eating disorders [16–18], or obsessive compulsive personality disorder [19].

Mentalization or the ability to mentalize can be conceptualized as a mental process that allows for the understanding and representation of inner mental states in oneself and others by considering thoughts, needs, emotions, wishes, and desires oneself might have as well as others [7,10,20]. Assumedly, mentalization develops during the fourth and fifth year of life [20,21], is closely linked to emotion regulation [21,22], and its development is facilitated by secure attachments and relationships [16,21]. Emotional mirroring processes at infancy might play an important role in the development of mental representations of internal states, and thus, provide the basis for the infants' emerging capacity to regulate her/his own affect. Deficits in mentalization include having no emotional awareness, not being self-reflective, or equating inner mental states with outer reality [23].

Given the young age mentalization develops, early aberrations in life such as adverse childhood experiences or disturbed attachments might be closely associated with impaired mentalization. Recent research confirms the association between adverse childhood experiences and poorer mentalization capacities [11,24], and also demonstrates the key role of mentalization as a mediator between adverse childhood experiences and adult psychopathologies like dissociation [24] or posttraumatic symptomatology [11]. The concept of mentalization might help to better understand associations between, e.g., adverse childhood experiences and mental health issues e.g., [25,26], and it might also prove to be an effective element of psychotherapeutic interventions [4–6].

For both clinical and research purposes, a feasible, valid and reliable instrument is necessary to assess mentalization. It was initially assessed with the 'Reflective Self Functioning Scale', an expert rating developed by Fonagy and colleagues [27]. Due to the need for an easily applicable self-rating instrument of mentalization, Hausberg and colleagues developed the 'Mentalization Questionnaire' (MZQ). A first validation of the MZQ in a sample of patients with mental disorders revealed acceptable reliability and sufficient validity to assess aspects of mentalization [7]. In order to generalize these findings, analyses of representative samples are necessary to test its performance in the general population.

The aim of our study was therefore to conduct a psychometric evaluation of the MZQ by testing several models on factorial validity and reliability based on data of a representative sample of the German population. In addition, we intended to provide representative norm values to assess mentalization capacities.

2. Materials and Methods

2.1. Sample and Setting

In cooperation with the independent demography research institute USUMA Berlin, data of a representative population sample was collected via interviews and self-report questionnaires. Between May and June 2020, 5418 households within 258 predefined regions were selected by a random route procedure. In households with multiple persons, one person was randomly selected using the Kish-Selection-Grid. Due to the COVID-19 pandemic, the interviews were conducted according to the applicable hygiene regulations (wearing face masks and keeping physical distance). Inclusion criteria were sufficient German language skills, an age ≥ 14 , and verbal informed consent. The survey 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 by the Ethics Committee of the Medical Faculty of the University of Leipzig (approval number: 043/20-ek).

2.2. Measures

2.2.1. Mentalization Questionnaire (MZQ)

The original version of the MZQ was developed as a self-rated instrument to assess mentalization from a patient's perspective by Hausberg and colleagues [7]. It consists of 15 items with responses ranging from 1 = 'no agreement at all' to 5 = 'total agreement' on a 5-point Likert scale. Analyses based on data from 434 German inpatients with mental disorders at three time points yielded four subscales with acceptable reliability and sufficient validity. Subscales comprised 'refusing self-reflection' (4 items), 'emotional awareness' (4 items), 'psychic equivalence mode' (4 items), and 'regulation of affect' (3 items). Calculated sum scores for the total scale range from 15 to 75 with higher scores indicating lower mentalization capacities.

2.2.2. Personality Functioning—Operationalized Psychodynamic Diagnosis Structure Questionnaire-Short Form (OPD-SQS)

The OPD-SQS is a 12-item self-report questionnaire to assess the level of personality functioning [28]. A total score and three subscales (self-perception, interpersonal contact, and relationship model) with four items each can be calculated. Responses range from 0 = 'does not apply at all' to 4 = 'fully applies'. Calculated sum scores for each scale range from 0 to 16 (total sum score 0 to 48) with higher scores indicating more severe impairments of personality functioning. The OPD-SQS showed good internal consistency [29] as well as good validity and reliability [30,31]. In the present sample, the OPD-SQS showed good internal consistency ($\omega = 0.89$) for the total scale, as well as for the subscales self-perception ($\omega = 0.85$), while the internal consistency for the subscales contact ($\omega = 0.77$) and relationship ($\omega = 0.79$) was acceptable.

2.2.3. Symptoms of Depression and Anxiety (PHQ-4)

The 4-item-version of the Patient Health Questionnaire (PHQ-4) measures mental distress within the last two weeks [32,33] by combining the GAD-2 (anxiety symptoms) and the PHQ-2 (depression symptoms). The sum score ranging from 0 to 12 is based on response options ranging from 0 = 'not at all' to 3 = 'nearly every day'. In the present sample, the PHQ-4 showed good internal consistency ($\omega = 0.83$).

2.2.4. Profile of Mood States—POMS

The Profile of Mood States (POMS) is a widely applied instrument to assess an individual's mood during the last 24 h in patients as well as non-clinical samples [34]. Response options on a 5 to 7-point Likert scale range from 0 = 'not at all' to 4 (6, respectively) = 'very strong'. Recently, a 16-item short version of the POMS could be validated in a German representative population based sample showing good reliability [35]. In this sample, the POMS sub-scales showed good internal consistency (ω : dejection = 0.85, vigor = 0.86, fatigue = 0.89, anger = 0.89).

2.3. Statistical Analyses

Demographics for the sample are presented with means and standard deviations (SD). Validation of the MZQ included analysis of acceptance, reliability, and validity. Participants were excluded if more than 50% of MZQ items were missing. Acceptance was evaluated by analysis of missing or invalid items, with <5% missing values per item was interpreted as satisfactory. To evaluate the MZQs reliability, corrected item-total correlations ($r < 0.3$ was considered weak) were calculated for all items and internal consistencies (McDonald's ω) for the total score and the proposed subscales of the MZQ. As a rule of thumb, McDonald's ω was interpreted similarly to Cronbach's α , meaning $\omega > 0.90$ is considered excellent, while $\omega > 0.80$ is considered good, $\omega > 0.70$ acceptable, and $\omega < 0.70$ questionable or poor [36].

Analysis of validity included evaluation of the factorial, convergent and discriminatory validity of the MZQ. To evaluate the factorial validity, confirmatory factor analysis (CFA)

was performed for the proposed four-factor solution of the MZQ [7]. Since the internal consistency was not satisfactory for the four factor-solution, further analyses were conducted. To do so, the data set was randomly split in two samples (S1 and S2). Exploratory factor analyses (EFAs; maximum likelihood with oblimin direct rotations) were performed in S1. Scree plots and Eigenvalues (<1.0) were used to determine the ideal number of factors. To further confirm results, a parallel analysis using the syntax by O'Connor [37] was applied ($n = 1000$ parallel datasets; 95% percentile).

The results of the EFA were tested with a CFA in S2 to validate the proposed factorial structure. As Littles' MCAR indicated that values were missing in random patterns in S2 ($\chi^2 = 198.359$, $DF = 228$, $p = 0.922$), data imputation was conducted with the Expectation-Maximization (EM) procedure. The use of complete datasets allowed for the application of modification indices in AMOS. Due to the high intercorrelation of the subscales, we tested unidimensional, bi-factor (three subscales and one general factor), as well as first- and second order (three subscales) models. To determine the models' goodness of fit, Pearson's chi-squared test (χ^2), the comparative fit index (CFI) and root mean square error of approximation (RMSEA) with lower and higher bounds of the 95% confidence interval (CI) were calculated. To evaluate whether the empirical data fit the theoretical model, the p -value of Close Fit (PCLOSE) was calculated based on the RMSEA values, with values of $p > 0.05$ indicating close fit and $p < 0.05$ indicating worse than close model fit. Acceptable goodness of fit was defined as RMSEA values of <0.08 and CFI/TLI values > 0.90 . Dimensionality was further evaluated by calculating the explained common variance (ECV), item explained common variance (IECV), the percentage of uncontaminated variance (PUC) and the Average Relative Parameter Bias (ARPB). ECV and PUC values > 0.70 and ARPB values < 10 – 15% indicate unidimensionality. Dimensionality indices were calculated using the Dueber Calculator [38]. Based on the dimensionality indices and the factor analyses, a short form of the scale was tested. From each factor that was identified by EFA, two items were included in a six-item short form. Items were chosen based on (I) loadings for the assigned factor as well as (II) factor loadings on the total score and (III) IECV loadings. The IECV loading indicates how high items with load on the general factor rather than onto the assigned factor. If IECV loadings and factor loadings were contradictory, preference was given to factor loading and theoretical assignment.

Subsequently the convergent validity of the short and long form of the questionnaire was tested. To evaluate convergent validity, Pearson correlation coefficients were calculated with the OPD-SQS total score and subscales. Discriminant validity of the MZQ was tested by comparing the values with measures of psychopathology: POMS-16, GAD-2, and PHQ-4. We hypothesized that the MZQ would be positively correlated with the OPD-SQS total score and subscales, as well as with the PHQ-4 score and POMS subscales, except 'vigor' which was assumed to be negatively correlated to higher MZQ scores. Additionally, we assumed that the OPD-SQS would show higher correlations with the MZQ than the PHQ-4 and POMS-16, since it assesses aspects of personality functioning, which are theoretically more closely linked to mentalization than mood and psychological distress. Statistical analyses were performed with IBM SPSS (v22.0): IBM Corp, Armonk, NY, USA and SPSS AMOS (v24.0): IBM SPSS: Chicago, IL, USA. p -values < 0.05 (two-sided) were considered statistically significant.

3. Results

3.1. Sample Characteristics

Of the initial $N = 2503$ participants who completed the survey, $n = 15$ were excluded due to missing MZQ items. Among the remaining $N = 2487$, $n = 1321$ were women and $n = 1$ diverse. Average age was $M = 46.0$ ($SD = 17.8$). The majority completed secondary school (40.4%), was either married (41.9%) or single (39.7%), and worked full time (42.7%). Sociodemographic characteristics of the sample are presented in Table 1.

Table 1. Sociodemographic data (N = 2487).

	n	(%)
Sex		
male	1165	(46.8)
female	1321	(53.1)
diverse	1	(0.04)
Age	(M = 46.0; SD = 17.8)	
<30	613	(24.6)
30–39	358	(14.4)
40–49	369	(14.8)
50–59	527	(21.2)
60–69	381	(15.3)
≥70	239	(9.6)
Education		
no qualification	58	(2.3)
general school	505	(20.3)
secondary school	1005	(40.4)
technical college/high school	476	(19.1)
university education	360	(14.5)
other	76	(3.1)
missing	7	(0.3)
Relationship		
married	1041	(41.9)
single	988	(39.7)
divorced	293	(11.8)
widowed	149	(6.0)
missing	16	(0.6)
Employment status		
full time	1063	(42.7)
part time	407	(16.4)
unemployed	219	(8.8)
in training	249	(10.0)
retired	503	(20.2)
missing	46	(1.8)
Monthly net household income		
<1500 EUR	699	(28.1)
1500–2499 EUR	584	(23.5)
2500–3499 EUR	534	(21.5)
≥3500 EUR	670	(26.9)

3.2. Acceptance

Overall acceptance of the MZQ items was satisfactory: only n = 90 (3.4%) of the participants did not answer one or more items, and only n = 12 (0.5%) participants left out more than one answer. The item with most missing values was item ten ('Sometimes I only become aware of my feelings in retrospect'). The number of missing items was neither associated with age ($p = 0.96$) nor sex ($p = 0.81$).

3.3. Psychometric Properties and Reliability

Means, standard deviations, corrected item-total correlations and internal consistencies are presented in Table 2. Corrected item-total coefficients ranged between 0.34 and 0.64 and the internal consistency for the total scale was good ($\omega = 0.88$). However, poor internal consistencies were found for three of the four subscales, namely 'refusing self-reflection' ($\omega = 0.65$), 'psychic equivalence mode' ($\omega = 0.67$), and 'regulation of affect' ($\omega = 0.69$), while acceptable values were found for 'emotional awareness' ($\omega = 0.79$).

Table 2. Psychometric properties and factorial structure of the MZQ and MZQ-6 short scale.

				Reliability		Factor Loading			
No	Item	M	SD	ITC	ω	EFA	CFA ^b	CFA ^c	IECV
Factor 1: Mental states in oneself regarding others— cognition and communication		2.4	0.7	-	0.69				
2	Explanations from others are of little assistance in understanding my feelings.	2.6	1.1	0.44		0.43	0.47	0.45	0.96
4 ^a	I only believe that someone really likes me a lot if I have enough realistic proof for it (e.g., a date, a gift or a hug).	2.5	1.3	0.52		0.55	0.56	0.52	0.96
7	It's difficult for me to believe that relationships can change.	2.4	1.1	0.45		0.54	0.51	0.44	0.99
9 ^a	Talking about feelings would mean that they become more and more powerful	2.1	1.1	0.62		0.64	0.70	0.65	1.00
13	If someone yawns in my presence, that's a reliable sign that he is bored in my company	2.0	1.1	0.41		0.47	0.47	0.43	1.00
14	Most of the time I don't feel like talking about my thoughts and feelings with others	2.8	1.2	0.38		0.46	0.44	0.35	0.93
Factor 2: Mental states regarding oneself— affect-regulation		2.2	0.9		0.80				
1	If I expect to be criticized or offended, my fear increases more and more	2.5	1.2	0.51		0.74	0.58	0.55	0.49
3	Sometimes feelings are dangerous for me	2.1	1.1	0.66		0.71	0.77	0.68	0.55
6 ^a	Often, I can't control my feelings	2.1	1.1	0.62		0.61	0.74	0.66	0.67
12 ^a	Often, I feel threatened by the idea that someone could criticize or offend me	2.2	1.1	0.66		0.71	0.71	0.68	0.78
Factor 3: Mental states regarding oneself— affect-perception and -differentiation		2.3	0.8		0.79				
5	Most of the time it is better not to feel anything	2.2	1.1	0.57		0.47	0.61	0.59	1.00
8	I tend to ignore feelings of physical tension or of discomfort until they compel my full attention	2.3	1.1	0.62		0.66	0.69	0.64	0.95
10	Sometimes I only become aware of my feelings in retrospect	2.7	1.1	0.56		0.74	0.62	0.60	0.85
11 ^a	Frequently it's difficult for me to perceive my feelings at their full intensity	2.3	1.1	0.62		0.76	0.68	0.66	0.90
15 ^a	Often, I don't even know what is happening inside of me	2.0	1.0	0.65		0.68	0.72	0.70	0.48

MZQ = Mentalization Questionnaire; No = Item number; M = mean score; SD = standard deviation; ITC = item-total correlation; EFA = exploratory factor analysis; CFA = confirmatory factor analysis; ^a item of the 6-item version; ^b factor loadings for assigned factor in CFA; ^c factor loadings for general factor.

3.4. Factorial Validity

The CFA of the proposed 4-factor solution showed low to borderline acceptable fit values with χ^2 (84) = 1151.1 ($p < 0.001$), CMIN/df = 13.70, TLI = 0.87, CFI = 0.91, RMSEA = 0.071 (95% CI: 0.068–0.075; PCLOSE < 0.001). See also Figure 1.

Due to the questionable internal consistencies of the proposed subscales, the dataset was randomly split in two subsamples for further analyses. In subsample 1 (n = 1229) an exploratory factor analysis (EFA) was calculated. Bartlett's test of sphericity (χ^2 (105) = 6294.2, $p < 0.001$) was significant and the Kaiser–Meyer–Olkin measure verified the sampling adequacy for the analysis (KMO = 0.92). Eigenvalues and scree-plot indicated a three-factor solution, explaining 54.6% of the variance. Two items showed cross loadings and were assigned to the lower loading factor based on the items and factors content: item 5 ('Most of the time it is better not to feel anything') loaded on factor 1 (0.66) and factor 3 (0.47). Since item content of factor 3 focused on affect perception and differentiation and factor 1 mainly

on cognition and communication, the item was assigned to factor 3 based on the analysis of the content of item and factor. Secondly, item 9 ('Talking about feelings would mean that they become more and more powerful') loaded on factor 1 (0.64) and factor 3 (0.61). Since factor 3 mainly focused on affect perception and -differentiation, the item was assigned to factor 3 based on the analysis of the content of item and factor. The content analysis for naming the extracted factors was independently conducted by two researchers, differences were resolved by consensus (reconciliation process). Based on the items content and in agreement with the theoretical background of mentalization based therapy, factor 1 was named 'mental states in oneself regarding others—cognition and communication', factor 2 'mental states regarding oneself— affect-regulation' and factor 3 'mental states regarding oneself— affect-perception and -differentiation'.

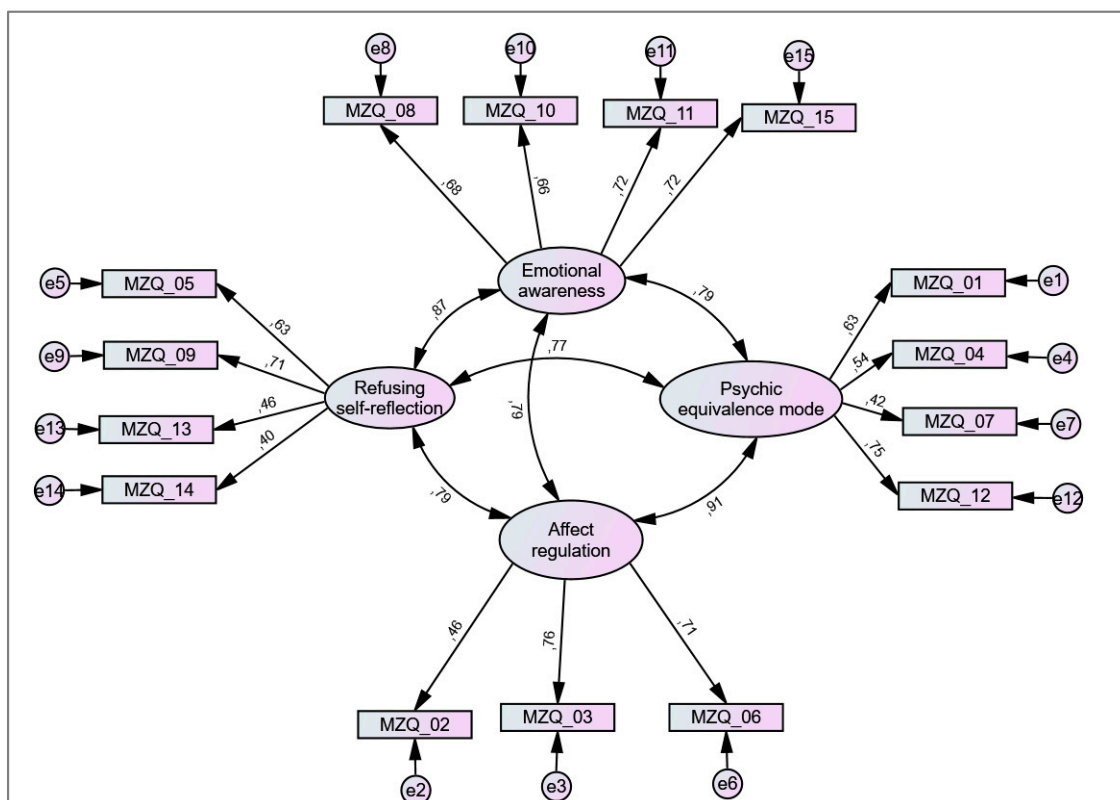


Figure 1. Previously proposed 4-factor solution for the Mentalization Questionnaire (MZQ). Large circles represent proposed factors, rectangles represent items (with corresponding item number), and small circles represent error terms (e). Numbers next to arrows in the model represent standardized estimates.

The newly developed three-factor solution was then tested with a CFA in subsample 2 ($n = 1259$). While fit indices slightly improved, the results were not satisfactory ($\chi^2(87) = 662.8$ ($p < 0.001$), $\text{CMIN}/\text{df} = 7.62$, $\text{TLI} = 0.89$, $\text{CFI} = 0.91$, $\text{RMSEA} = 0.073$ (95% CI: 0.068–0.079; $\text{PCLOSE} < 0.001$). Internal consistencies were acceptable to good for factor 2 ($\omega = 0.80$) and 3 ($\omega = 0.79$), while values for factor 1 were questionable ($\omega = 0.69$). The model is shown in Figure 2. A comparison of the assigned items for the 3- and 4-factor solution is shown in the Supplementary Materials section (S1).

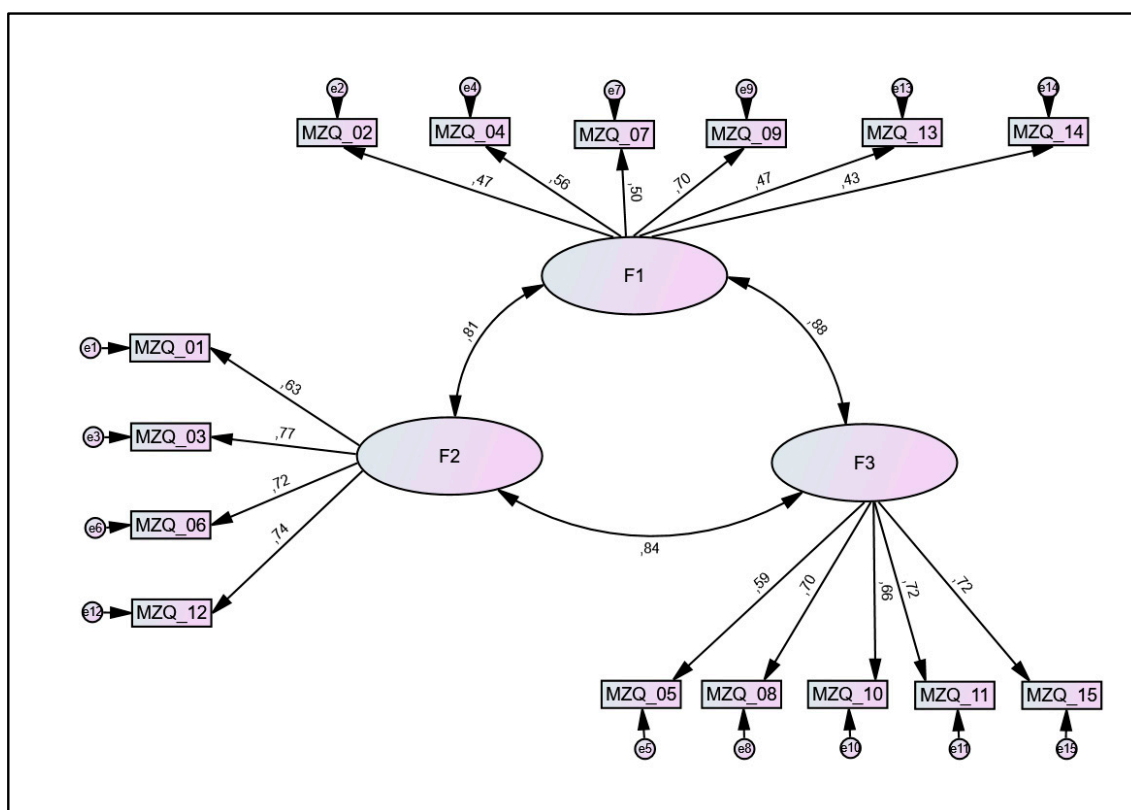


Figure 2. Newly introduced 3-factor solution for the Mentalization Questionnaire (MZQ). Large circles represent proposed factors, rectangles represent items (with corresponding item number), and small circles represent error terms (e). Numbers next to arrows in the model represent standardized estimates. F1 = factor 1 ('mental states in oneself regarding others—cognition and communication'; F2 = factor 2 ('mental states regarding oneself— affect-regulation'); F3 = factor 3 ('mental states regarding oneself— affect-perception and -differentiation').

3.5. Dimensionality

Since the three subscales showed particularly high intercorrelations ($r = 0.82$ – 0.90 ; $p < 0.001$), the scales' dimensionality was further evaluated. When comparing the bi-factor model (three subscales and a general factor; see Figure 3) with the correlated first-order model (three subscales), bi-factor indices clearly indicated a unidimensional structure of the MZQ (ECV = 0.787; PUC = 0.705; ARPB = 10.7%) and the item-based evaluation showed, that ten of the 15 items (66.7%) measured the general factor better than the assigned factor (IECVs > 0.85). Additionally, fit indices for the bi-factor solution were clearly superior to the three-factor model ($\chi^2(70) = 314.3$ ($p < 0.001$), CMIN/df = 4.49, TLI = 0.94, CFI = 0.96, RMSEA = 0.053 (95%CI: 0.047–0.059; PCLOSE = 0.18).

Thus, we subsequently tested a shortened version of the MZQ for a general factor model. For this, the six items with highest IECV loadings as well as highest loadings for the assigned and the general factor were chosen (see Table 2). Model fit was borderline acceptable ($\chi^2(6) = 54.398$ ($p < 0.001$), CMIN/df = 9.07, TLI = 0.94, CFI = 0.98, RMSEA = 0.081 (95% CI: 0.062–0.101; PCLOSE = 0.004) and the internal consistency was good ($\omega = 0.80$).

3.6. Convergent Validity

Both the MZQ 15-item and MZQ 6-item version were correlated with the OPD-SQS total score and subscales to evaluate convergent validity (see also Table 3). The MZQ-15 and MZQ-6 total score had a correlation of $r = 0.94$ ($p < 0.001$).

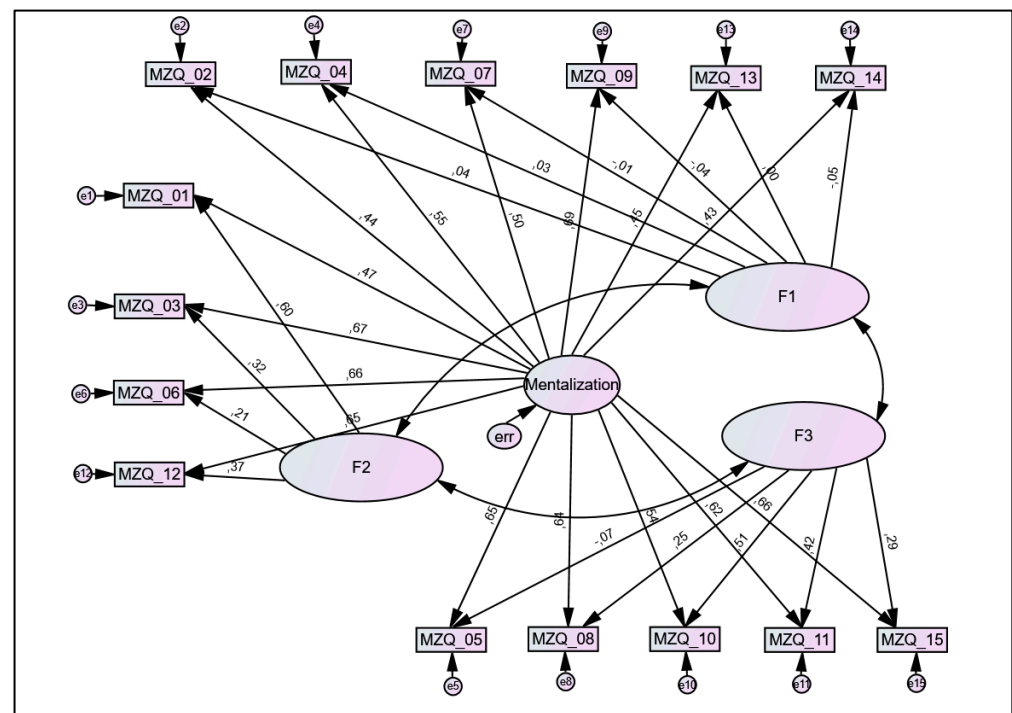


Figure 3. Bi-factor model for the Mentalization Questionnaire (MZQ) with a general factor and three subscales. Large circles represent proposed factors, rectangles represent items (with corresponding item number), and small circles represent error terms (e). Numbers next to arrows in the model represent standardized estimates. F1 = factor 1 ('mental states in oneself regarding others—cognition and communication'; F2 = factor 2 ('mental states regarding oneself— affect-regulation'); F3 = factor 3 ('mental states regarding oneself— affect-perception and -differentiation').

Table 3. Correlations of MZQ-10 and MZQ-15 total score with OPD-SQS total score and subscales.

	OPD SQS Total Score	OPD SQS Self-Perception	OPD SQS Contact	OPD SQS Relationship
MZQ-6	0.71 ***	0.69 ***	0.60 ***	0.54 ***
MZQ-15	0.73 ***	0.67 ***	0.60 ***	0.60 ***

MZQ = Mentalization Questionnaire; OPD SQS = Operationalized Psychodynamic Diagnosis Structure Questionnaire-Short Form; *** $p < 0.001$.

As for the convergent validation, the correlation of the MZQ-6 total scale, MZQ-15 total score and subscales with the POMS-16 and PHQ-4 were substantially lower than with the SQS. While the POMS-16 subscales dejection, fatigue and anger as well as the PHQ-4 total score—indicating depression and anxiety—were significantly associated with lower mentalization, the POMS-16 subscale vigor was associated with higher mentalization. The MZQ-6 and MZQ-15 showed comparable correlations with the associated factors. For details refer to Table 4.

Table 4. Correlations of MZQ-15 and MZQ-6 total score with POMS-16 subscales scores and PHQ-4 scores.

	POMS Dejection	POMS Vigor	POMS Fatigue	POMS Anger	PHQ-4
MZQ-6 total score	0.46 ***	−0.11 ***	0.35 ***	0.36 ***	0.45 ***
MZQ-15 total score	0.46 ***	−0.22 ***	0.35 ***	0.36 ***	0.45 ***

MZQ = Mentalization Questionnaire; POMS = Profile of Mood States; *** $p < 0.001$.

3.7. Norm Values—Normed Means for Different Age Groups and Gender

Table 5 shows a summary of mean scores and standard deviations for the MZQ and the three extracted subscales across all analyzed age groups for male and female participants. In our sample, age groups significantly differed in the overall MZQ-15 ($F(5, 2487) = 11.468$, $p < 0.001$; $\eta^2 = 0.023$) and MZQ-6 scores ($F(5, 2487) = 15.092$, $p < 0.001$; $\eta^2 = 0.030$). For the MZQ-15 total score no significant mean differences were found for gender ($p = 0.12$) nor gender*age ($p = 0.09$). For the MZQ-6 total score no gender differences ($p = 0.21$), but a significant gender*age group effect was observed ($F(5, 2487) = 2.324$, $p = 0.041$; $\eta^2 = 0.005$).

Table 5. Norm values—normed sum scores for the MZQ-15 and MZQ-6 total score for male and female participants across age-groups.

Age	Sex	n	MZQ-15 Total Score		MZQ-6 Total Score	
			Mean	(SD)	Mean	(SD)
<30	M	306	34.5	(9.55)	14.0	(4.29)
	F	306	37.8	(10.39)	14.8	(5.13)
30–39	M	163	34.9	(10.69)	13.1	(4.62)
	F	196	35.6	(10.89)	13.9	(5.14)
40–49	M	181	34.5	(10.41)	12.9	(4.54)
	F	188	34.4	(10.70)	12.8	(4.81)
50–59	M	242	34.6	(9.56)	12.9	(4.24)
	F	286	33.0	(10.18)	12.1	(4.50)
60–69	M	175	31.8	(8.57)	12.0	(3.96)
	F	206	33.6	(9.94)	12.5	(4.50)
≥70	M	98	33.6	(9.64)	12.6	(4.38)
	F	140	35.2	(9.76)	13.0	(4.65)
Total sample	M	1165	34.6	(9.8)	13.1	(4.37)
	F	1322	35.0	(10.46)	13.3	(4.90)
	total	2488	34.8	(10.17)	13.2	(4.66)

M = male; F = female; n = number of participants; SD = standard deviation.

4. Discussion

The aim of this study was a psychometric evaluation of the 15-item version of the MZQ [7] by testing several models on factorial validity and reliability and to provide representative norm values for the preferred model based on data of a representative sample of the German population. In contrast to Hausberg and colleagues who originally developed the 15-item version of the MZQ [7], our findings did not support the proposed 4-factor solution. Instead, we tested an alternative 3-factor solution identified in exploratory factor analysis. However, high intercorrelations between factors indicated a strong underlying general factor which was further supported by analyses of dimensionality. Based on these findings, we tested a six item short version (MZQ-6). Fit statistics of the MZQ-6 were comparable to the bi-factor version of the MZQ-15, while both reliability (internal consistency) and validity (correlations with OPD-SQS) of the MZQ-15 and MZQ-6 were comparable. Regarding their initial analyses, Hausberg and colleagues did not recommend using the MZQ subscales prior to further validation [7]. Given that our results neither support using the proposed four subscales nor the newly developed three subscales, we recommend using either the MZQ-15 total score or the MZQ-6 total score. While the MZQ-15 may allow a more nuanced assessment of mentalization, the MZQ-6 may be particularly feasible for screening purposes. Our data does not support the use of MZQ subscales in the general population.

However, it can be assumed that a representative sample of the general population presents overall good mentalization capacities, and hence, might not reflect specific impairments in mentalization in terms of statistically representable subscales. Given that impairments in mentalization are implicated in various psychological problems and disorders [39], and the fact that our results also suggest high associations with depressive and anxiety symptoms, future research will have to measure the MZQ in a clinical sample

where it yet might yield robust results for the 3- or 4-factor solutions resulting in applicable subscales. Additionally, the construct validity of the MZQ-6 should be investigated by comparison with other mentalization-based questionnaires or interviews.

Consistent with other studies demonstrating that mentalization and personality functioning are interrelated constructs [40–44], we also found high correlations between the MZQ and the OPD questionnaire; here, higher impairments in personality functioning are associated with lower levels of mentalization. Zetl and colleagues suggest that disturbances in identity, self-direction, empathy, and intimacy are associated with lower levels of mentalization, whereas no to little impaired personality functioning is linked with higher levels of mentalization [40]. Early childhood relationship experiences are highly relevant for the development of personality functioning in terms of basic mental capacities such as adaptive coping behaviors and the formation of a stable identity [45–47]. Early disturbances in this developmental process—e.g., in form of childhood adversity and attachment disruptions—might result in both impaired personality functioning and low mentalization capacities [11,24,39] which, in turn, might lead to vulnerability for later mental health issues such as, e.g., depression, anxiety, dissociation, or self-harm [24,25,48–51]. Research on these associations can help us to get a better understanding of the inner workings of the mind and it can also inspire new perspectives regarding the psychopathology of mental health issues. For example, based on previous research on attachment and mentalization Fonagy, Luyten, and Allison recently proposed a developmental framework which suggested that the construct of epistemic trust (i.e., ‘the capacity to trust the relevance and generalizability of intentional communication’) might confer a vulnerability for the psychopathology underlying personality disorders [40,52,53]. A deeper knowledge on aspects like mentalization derived from studies using appropriate instruments such as the MZQ can further inform diagnosis, treatment, and future research.

There are potential limitations that should be considered regarding the study results. While overall quality of the data is high (unbiased representations of the general population), the cross-sectional study design limits the interpretation of results in terms of evaluation of test–retest reliability, sensitivity to change and predictive validity. In addition, the MZQ only allows for measuring representation of inner mental states in oneself, whereas external mentalizations in others are not properly addressed. Since at the time of the study design to our knowledge no other questionnaire adequately assessing mentalization has been validated in German, we chose to use associated scales (OPS-SQS, POMS-16 and PHQ-4) to evaluate convergent validity. It would be worthwhile however, to compare the MZQ to other mentalization-oriented questionnaires which have been developed in the meantime (e.g., the “Certainty About Mental States Questionnaire—CAMSQ” [54]) to evaluate content validity of the MZQ-15 and MZQ-6.

5. Conclusions

The MZQ is a feasible, reliable and valid self-report instrument to measure representations of inner mental states. However, when applied to non-clinical samples, the total score of the MZQ-15 or of the MZQ-6 screening scale should be used. Further research is necessary to examine the MZQ and its suggested subscales in clinical patient samples. Brief measures like the MZQ-6 make it possible to further research the meaning of mentalization in the context of mental health, and hence, can help to improve our understanding and knowledge of mentalization and its associations with other constructs like for example personality functioning or epistemic trust.

Supplementary Materials: The following supporting information can be downloaded at: <https://www.mdpi.com/article/10.3390/diagnostics13010135/s1>, Table S1: Item assignment for the 3- and 4-factor solution.

Author Contributions: Conceptualization, A.L. and D.R.; methodology, D.R.; data curation: A.L., J.K., M.E.B. and E.B.; formal analysis, D.R.; writing—original draft preparation, D.R. and H.K.;

writing—review and editing, A.L., T.N., J.K., M.E.B. and E.B.; supervision: A.L. and J.K. All authors have read and agreed to the published version of the manuscript.

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Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The data of the study are available from the corresponding author upon reasonable request.

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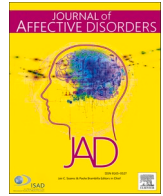
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4.3. PUBLIKATION III

Freier A, Kruse J, Schmalbach B, Zara S, Werner S, Brähler E, Fegert JM, & **Kampling H** (2022)[#]. 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, 408-15. DOI: 10.1016/j.jad.2021.12.020



The mediation effect of personality functioning between different types of child maltreatment and the development of depression/anxiety symptoms – A German representative study

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ABSTRACT

Background: Child maltreatment (CM) is associated with an increased risk to develop symptoms of depression/anxiety across an individual's lifespan. Recent studies indicated that impairments in personality functioning might mediate this association. The purpose of this study is to add evidence of this mediating effect by regarding different types of CM (emotional, physical and sexual abuse as well as emotional and physical neglect) in the general population.

Methods: A representative sample of the German population ($N = 2,354$) completed a set of standardized measures (OPD-SQS: Operationalized Psychodynamic Diagnosis - Structure Questionnaire Short, PHQ-4: Patient Health Questionnaire, CTQ: Childhood Trauma Questionnaire). Mediation analyses were carried out to examine the association between CM types, symptoms of depression/anxiety, and personality functioning.

Results: Up to two-thirds of the associations between CM types and symptoms of depression/anxiety are mediated by personality functioning [indirect effect: emotional abuse ($\beta = 0.219$, 95%-CI: 0.187–0.251, $p < .001$), physical abuse ($\beta = 0.151$, 95%-CI: 0.123–0.178, $p < .001$), sexual abuse ($\beta = 0.163$, 95%-CI: 0.138–0.188, $p < .001$), emotional neglect ($\beta = 0.131$, 95%-CI: 0.104–0.159, $p < .001$) and physical neglect ($\beta = 0.102$, 95%-CI: 0.078–0.127, $p < .001$)].

Limitations: Symptoms of depression/anxiety were measured with screening instruments and results are based on cross-sectional data.

Conclusions: The present investigation expands the evidence on the mediating effect of personality functioning in the association between CM and depression/anxiety symptoms based on data of the general population. Our results show the relevance of types, as the mediating effects are slightly stronger in CM abuse types than in CM neglect types. Knowledge about impaired personality might be an angle for clinical interventions and inspire future research.

1. Introduction

Child maltreatment (CM) is a worldwide problem with an estimated prevalence for high-income countries between 4% and 16% (Gilbert et al., 2009). The World Health Organization (WHO) defines CM as “all

forms of physical and/or emotional ill-treatment, sexual abuse, neglect or negligent treatment” (World Health Organization, 1999). The presence of CM is an established risk factor for psychopathology like post-traumatic stress disorders (PTSD), depression or anxiety (Ajiliani Abbasi et al., 2015). A recent meta-analysis demonstrated that people with CM

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had twice the risk of developing depression compared to people with no history of CM, while the risk for anxiety disorders was 2.7 times higher (Li et al., 2016). Although the relationship between CM and adult mental disorders has been well researched, there is limited evidence on the underlying pathways through which CM might lead to the development of mental disorders later in life. Research in this area has proposed multiple potential mechanisms by which CM increases the risk for psychopathology ranging from epigenetic processes and gene expression to neuroendocrine, immune, and neurotransmitter systems, brain structure and function, social cognition (Jaffee, 2017) and recently, personality functioning (Dagnino et al., 2020; Krakau et al., 2021).

Personality functioning – also called structure – is a comprehensive model composed of different dimensions, such as identity, the quality of interpersonal relationships, and coping strategies (Gruber et al., 2020). One of the first classification systems which defined personality functioning systematically was the Operationalized Psychodynamic Diagnosis system (Arbeitskreis, 1996). This classification system – meanwhile updated to a second edition (OPD-2) – characterized personality functioning as a person's abilities in four domains related to capacities of cognition/perception, regulation, communication, and attachment. Each of these capacities is directed toward the self and others – resulting in eight basic psychological functions (e.g., self-perception, self-regulation and regulation of relationships) (Arbeitskreis 2006). In the form of a diagnostic concept it was already included in the Alternative Model for the Assessment of Personality Disorders in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) (American Psychiatric Association and American Psychiatric Association, 2013; Bender et al., 2011) or the International Classification of Diseases, 11th version (ICD-11) (Tyrer et al., 2011).

Given that personality functioning usually develops in early

childhood (Beebe et al., 2010), CM might impair this developmental process (Luyten et al., 2020). Individuals with impairments in personality functioning tend to suffer from severe disturbances of the self and their interpersonal relations, and have an increased risk for developing mental disorders like depression and anxiety (Cremptien et al., 2017; Doering et al., 2018). Recent studies found a mediating effect of personality functioning in the association between only two CM types (physical and sexual abuse) and depression in a clinical sample (Dagnino et al., 2020) as well as between multiple CM and somatic symptoms, mental distress and body dysmorphic concern in a population-based sample (Krakau et al., 2021).

There is evidence that the association between CM and psychopathologies is mediated by personality functioning. However, the findings are based on screening instruments for CM. Thus, a population-based investigation with a detailed measure of CM could extend the evidence on the mediating role of personality functioning in the association between different types of CM and symptoms of depression/anxiety.

The aim of this study was to test the mediator model of personality functioning in the relationship between different types of CM (namely emotional, physical and sexual abuse as well as emotional and physical neglect) and depression/anxiety symptoms in a representative German sample. The study is based on earlier research investigating this mediator. Based on this previous findings, it was expected that the severity of each CM type would be positively associated with symptoms of depression/anxiety and that this effect would be mediated by impairments in personality functioning.

2. Method

Between September and November 2016, a representative sample of

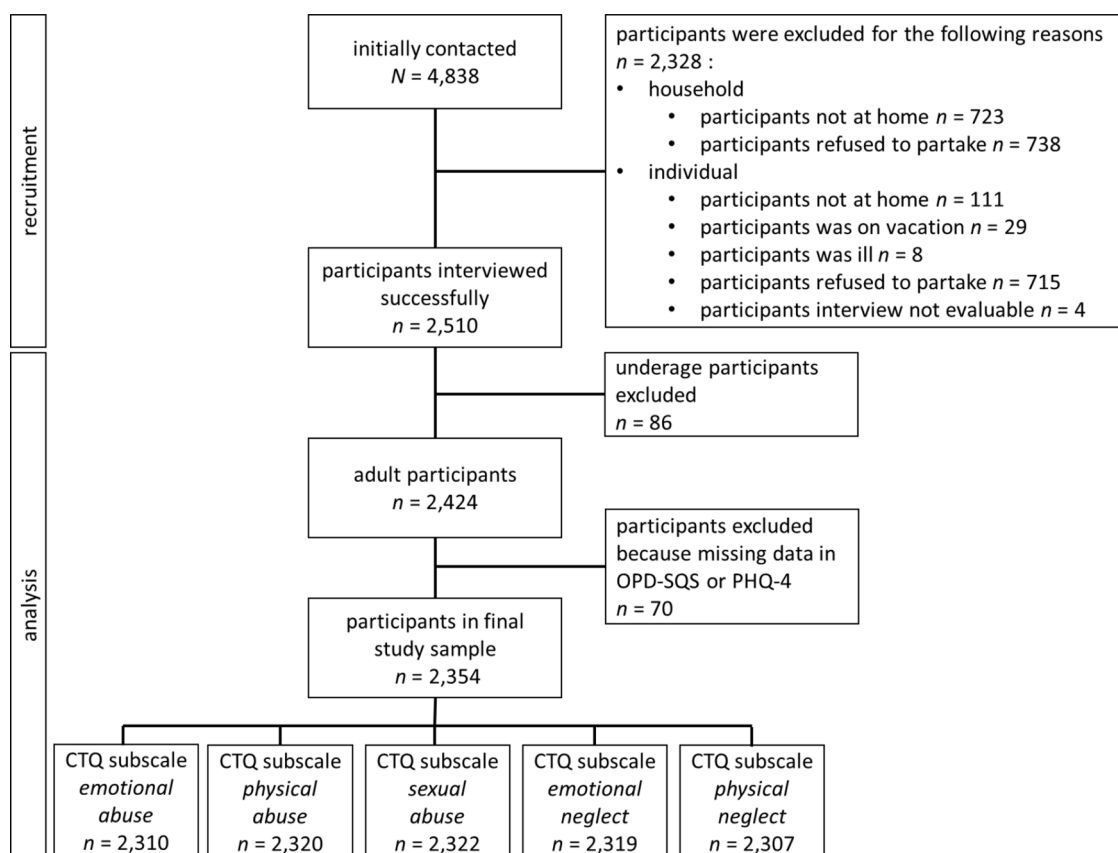


Fig. 1. Flowchart showing an overview of the study sample of participants included in the investigation, reasons why excluded during recruitment and analysis, and showing the final study samples for the CTQ subscales.

Note. OPD-SQS = Operationalized Psychodynamic Diagnosis - Structure Questionnaire Short. PHQ-4 = Patient Health Questionnaire. CTQ = Childhood Trauma Questionnaire.

the German population was acquired by a demography consulting company (USUMA, Berlin, Germany) as part of a broader survey on different aspects of mental health. Inclusion criteria were a minimum age of 14 and sufficient knowledge of the German language, responses were given anonymously. In the first step $N = 4838$ households were contacted (Fig. 1). A study assistant visited all participants at home, informed them about the investigation, and the participants provided written informed consent. In the next step, socio-demographic information was obtained in an interview format by research staff. Then the survey was conducted via paper and pencil. The study assistant was present to offer help if the meaning of questions was not clear. The sample was representative with regard to age, gender, education, and the geographic region of the participants.

2.1. Participants

A total of $N = 2510$ persons were successfully interviewed in the study. Given that personality functioning is a developmental process and might not be valid in underage persons, we excluded people under the age of 18 years. Other participants were excluded due to missing values in the assessment of personality functioning and in the questionnaire of depression/anxiety symptoms ($n = 70$). The final study sample was $N = 2354$. Missing values in the questionnaire of CM types did not lead to the complete exclusion of a participant's data, but only on the respective CM type. For a detailed description of reasons for exclusion of participants, see Fig. 1.

2.2. Assessment

2.2.1. Child maltreatment

The Childhood Trauma Questionnaire (CTQ) was used for self-reporting of CM (Bernstein et al., 2003; German version: Wingenfeld et al., 2010). The CTQ is a reliable and valid screening measure for child maltreatment, including subscales for emotional abuse, physical abuse and sexual abuse, as well as emotional neglect and physical neglect. In the CTQ, 28 items about childhood events are quantified on a 5-point Likert scale (1 = “never true” – 5 = “very often true”), with a high score indicating a high degree of traumatic experiences. The internal consistency ranged between Cronbach's $\alpha = 0.55$ and $\alpha = 0.89$, with the physical neglect scale showing the weakest internal consistency. The other subscales are high with $\alpha \geq 0.80$ (Klinitzke et al., 2012). In addition to a dimensional scoring procedure, a degree of severity rating was used. Based on norm data by Häuser et al. (2011), severity scores for each subscale can be calculated, providing threshold scores for each subscale to determine the severity of abuse and neglect in the following degrees: “none”, “minimal”, “moderate”, and “severe”. In order to calculate prevalence's for each type of maltreatment, a cut-off of at least “moderate” was chosen.

2.2.2. Depression/anxiety symptoms

Symptoms of depression/anxiety were assessed with the 4-item Patient Health Questionnaire (PHQ-4) (Kroenke et al., 2009). Two PHQ-4 items measure two of the DSM-IV (American Psychiatric Association, 1998) criteria for major depression on a 4-point scale (0 = “not at all” – 3 = “nearly every day”). The other two items measure two DSM-IV criteria for general anxiety disorder. The total score of the PHQ-4 ranges from 0 to 12. The PHQ-4 has shown acceptable reliability with an internal consistency of $\alpha = 0.78$ in the general population (Löwe et al., 2010).

2.2.3. Personality functioning

Personality functioning was measured with the 12-item version of the OPD Structure Questionnaire (OPD-SQS) (Ehrental et al., 2015). This is a short version of the OPD-SQ (Ehrental et al., 2012), originally consisting of 95 items. It is similar to other methods used to measure personality pathologies (König et al., 2016; Zimmermann et al., 2015)

and appropriate for screening personality dysfunctions in patients (Obbarius et al., 2019). In addition, a recent study reported good reliability and validity for the general population independent of gender and age (Ehrental et al., under review). The OPD-SQS consists of a 0–4 Likert scale (0 = “fully disagree” – 4 = “fully agree”). It measures three highly correlated subscales: self-perception, shaping contact, and key relationship models. The total score of the PHQ-4 ranges from 0 to 12. Lower scores on the OPD-SQS indicate better personality functioning, whereas higher scores on the OPD-SQS indicate impairments in personality functioning.

2.3. Statistical analysis

The data analysis was conducted in R (Version 4.0.2; R Core Team, 2013). Descriptive statistics were calculated for sociodemographic variables, depression/anxiety symptoms, CM types and personality functioning. Pearson correlation analyses were carried out to examine the association between CM types, depression/anxiety symptoms and personality functioning. For the mediation analyses, we standardized the variables of depression/anxiety symptoms, personality functioning and CM types, and used the package lavaan (Rosseel, 2012). The total effect of a mediation describes the association between each of the CM types and depression/anxiety symptoms. The total effect consists of two components; the direct and the indirect effect. The direct effect refers to the part of the total effect that occurs without the mediating variable, and the indirect effect refers to the part of the total effect that is the result of mediation alone. The proportion of the mediating (indirect) effect as a proportion of the total effect was also calculated (Peters, 2017; Shrout and Bolger, 2002). As outlined in Preacher and Hayes (2004), mediation emerges when the indirect effect is significant and the confidence intervals (CI) exclude zero.

3. Results

3.1. Participant characteristics

Characteristics of the final study sample are presented in Table 1. The mean age was 49.3 years (range 18–94 years). 53.2% of participants were female. 39.2% of participants completed 10 years of education, followed by 33.3% with less and 26.7% with more than 10 years of education. The full or part-time employment rate was 58.6%, and the unemployment rate was 5.5%. Most of the participants (59.1%) had a personal income of € 1000–2500. The generalizability of the results to the general German population has been verified in previous studies (Schmalbach et al., 2020; Witt et al., 2017).

In this study, 44.5% of the participants reported any type of CM, ranging from minimal to extreme severity (55.5% reported no CM). At least moderate severity of CM was reported by 6.0% of participants for emotional abuse, 6.3% for physical abuse, 7.5% for sexual abuse, 12.9% for emotional neglect, and 22.8% for physical neglect.

3.2. Associations between personality functioning, depression/anxiety symptoms and CM

To explore the associations between depression/anxiety symptoms, CM and personality functioning, Pearson correlations were calculated and presented in Table 2. The strongest association was found between personality functioning and depression/anxiety symptoms ($r = 0.554$), indicating that the higher the impairments in personality functioning, the more severe symptoms of depression/anxiety are reported. All CM types were positively correlated with depression/anxiety symptoms, ranging from $r = 0.239$ to $r = 0.372$. Personality functioning and the CM types also show positive correlations ranging from $r = 0.194$ to $r = 0.457$.

For a better illustration of the association between the different types of CM and personality functioning, each type of CM was classified

Table 1
Sociodemographic and measures characteristics.

Variable	n	(%)	M	(SD)
total N	2354	(100)		
age			49.5	(17.4)
sex				
female	1253	(53.2)		
male	1101	(46.8)		
marital status				
married, living together	1061	(45.1)		
married, living separated	52	(2.2)		
unmarried	678	(28.8)		
divorced	341	(14.5)		
widowed	214	(9.1)		
not stated	8	(0.3)		
education status				
≤ 9 years	785	(33.3)		
10 years	923	(39.2)		
≥ 11 years	630	(26.7)		
pupil/student	7	(0.3)		
other (e.g., special school) or not stated	9	(0.5)		
employment status				
full-time employment	1047	(44.5)		
part-time employment	332	(14.1)		
unemployment	130	(5.5)		
pensioners	613	(26.0)		
other (e.g., student, parental leave)	232	(9.8)		
personal income				
under 1000 €	739	(31.4)		
1000 – 2500 €	1390	(59.1)		
over 2500 €	225	(9.5)		
depression/anxiety symptoms (PHQ-4)			5.38	(2.14)
personality functioning (OPD-SQS)			10.62	(8.07)
child maltreatment (CTQ)				
subscale emotional abuse			6.80	(2.97)
subscale physical abuse			5.88	(2.34)
subscale sexual abuse			5.57	(2.01)
subscale emotional neglect			9.47	(4.39)
subscale physical neglect			7.71	(2.97)

Note. OPD-SQS = Operationalized Psychodynamic Diagnosis - Structure Questionnaire Short. PHQ-4 = Patient Health Questionnaire. CTQ = Childhood Trauma Questionnaire.

Table 2
Pearson correlations of PHQ-4, OPD-SQS, and CTQ subscales.

	PHQ-4	OPD-SQS
OPD - SQS	.554***	
CTQ - emotional abuse	.372***	.457***
CTQ - physical abuse	.265***	.290***
CTQ - sexual abuse	.265***	.312***
CTQ - emotional neglect	.247***	.251***
CTQ - physical neglect	.239***	.194***

Note. * $p < .05$; ** $p < .01$; *** $p < .001$; OPD-SQS = Operationalized Psychodynamic Diagnosis - Structure Questionnaire Short. PHQ-4 = Patient Health Questionnaire. CTQ = Childhood Trauma Questionnaire.

according to the degrees of severity: none, minimal, moderate and severe. The associations between the scores of OPD-SQS and the five CM subscales are presented in Fig. 2 and Table 3. The CTQ subscales emotional abuse, physical abuse and physical neglect showed continuous increases in the impairments in personality functioning. Thus, the more severe the CM, the more impairments in personality functioning could be found. This was not the case for the subscale emotional neglect and the subscale sexual abuse. For the subscale emotional neglect, a change from “moderate” to “severe” did not result in more impaired personality functioning but remained stable. The same was the case for sexual abuse for the change from “minimal” to “moderate”. Furthermore, in the case of the CTQ subscale sexual abuse a large increase in the impairments in personality functioning between “moderate” and “severe” was found (additional statistical analyses can be found in a supplementary data article, see (Freier et al., under review)).

3.3. Mediation analysis

The mediation analyses showed that significant associations between CM and values of depression/anxiety symptoms are mediated by impairments in personality functioning to a similar degree (see Fig. 3). The total effects between scores of the CTQ subscales and values of depression/anxiety symptoms were significant and vary in a range between $\beta = 0.238$, 95% CI [0.192–0.284], $p < .001$ for physical neglect and $\beta = 0.371$, 95% CI [0.314–0.427], $p < .001$ for emotional abuse. In all subscales there was a significant mediating (indirect) effect of CM on values of depression/anxiety symptoms through impairments in personality functioning: emotional abuse ($\beta = 0.219$, 95% CI [0.187–0.251], $p < .001$), physical abuse ($\beta = 0.151$, 95% CI [0.123–0.178], $p < .001$), sexual abuse ($\beta = 0.163$, 95% CI [0.138–0.188], $p < .001$), emotional neglect ($\beta = 0.131$, 95% CI [0.104–0.159], $p < .001$) and physical neglect ($\beta = 0.102$, 95% CI [0.078–0.127], $p < .001$). This indicates that impairments in personality functioning mediate about two-thirds of the associations between all scores of the CTQ abuse subscales and values of depression/anxiety symptoms. In the CTQ neglect subscales, the mediating effects are less strong, 53% for emotional neglect and 43% for physical neglect. Only minor associations (direct effects) between the scores of the CTQ subscales and values of depression/anxiety symptoms remain (range: $\beta = 0.102$ for sexual abuse and $\beta = 0.152$ for emotional abuse). Post-hoc analyses conducted separately for symptoms of anxiety and depression showed no considerable differences, neither were there any notable gender differences (post-hoc analyses can be found in a supplementary data article, see (Freier et al., under review)).

4. Discussion

The major finding of the present investigation shows the mediating effect of personality functioning in the association between emotional, physical and sexual abuse as well as emotional and physical neglect and symptoms of depression/anxiety. Our results suggest that up to two-thirds of the association is mediated by personality functioning. Higher levels in CM of any type correspond with higher impairments in personality functioning and more severe symptoms of depression/anxiety.

This result is consistent with the findings obtained by Dagnino et al. (2020), who found a mediating effect of personality functioning in the association between sexual and physical abuse and depression in a clinical sample. Our findings indicate that this might apply to symptoms of anxiety as well. Further, the results for depression and anxiety are not limited to clinical samples, but are also transferable to the general population. This is in line with the study by Krakau et al. (2021), who found a mediation effect of personality functioning in the association between multiple CM and different mental health outcomes in the general population. The present study added to this result by using a more recent representative sample and examining different types of CM.

In contrast to previous studies (Dagnino et al., 2020; Krakau et al., 2021) this investigation was based on a more detailed measure of CM, which allowed the examination of different types of CM. The mediation effect of personality functioning was stable for the different types of CM and ranged between 43% and 62%. The strongest mediation effect was found for abuse types. Neglect types showed a slightly weaker mediation effect, and a weaker association with impairments in personality functioning than abuse types. In particular, physical neglect had the weakest association with personality functioning and also the weakest mediation effect. This could be related to the weak internal consistency of the physical neglect scale in the CTQ (Klinitzke et al., 2012), leading to a distortion of the scale, especially among participants over 60 years of age. Klinitzke et al. (2012) suggest that the circumstances for people growing up in post-war Germany often included physical neglect (malnutrition, insufficient clothing, etc.), which could lead to a possible bias in the results. However, further investigations especially in other

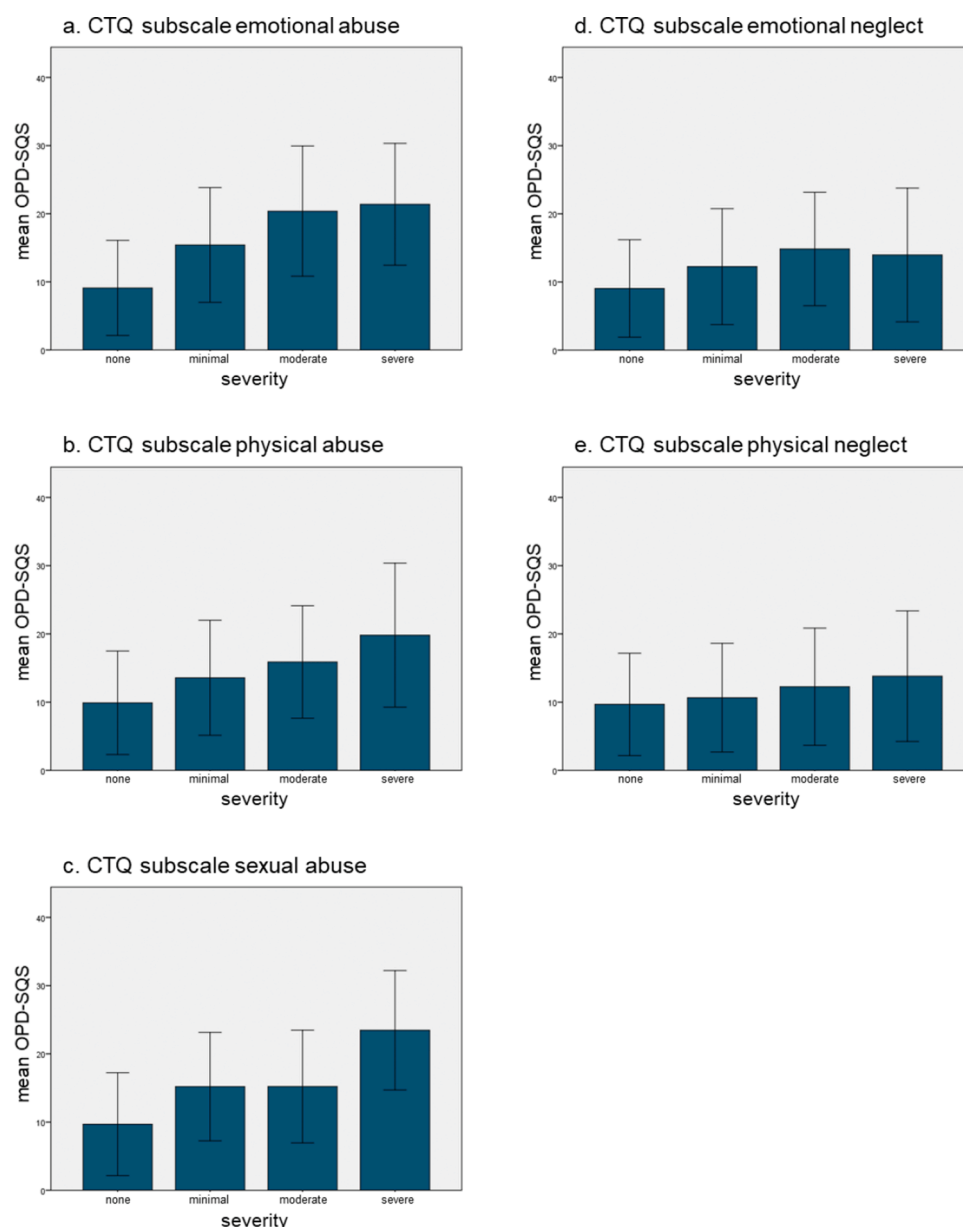


Fig. 2. Means of personality functioning in relation to the severity of CM (none, minimal, moderate, severe). Error bars represent ± 1 standard deviation. Note. OPD-SQS = Operationalized Psychodynamic Diagnosis - Structure Questionnaire Short. CTQ = Childhood Trauma Questionnaire.

Table 3

CTQ subscales presented as numbers and percentages for each severity degrees. Means (M) and standard deviations (SD) are reported for scores of OPD-SQS.

CTQ subscale	None				Minimal				Moderate				Severe			
	n	(%)	M	(SD)	n	(%)	M	(SD)	n	(%)	M	(SD)	n	(%)	M	(SD)
Emotional abuse $n = 2310$	1890	81.8	9.10	(6.99)	281	12.2	15.41	(8.42)	82	3.5	20.38	(9.56)	57	2.5	21.39	(8.04)
Physical abuse $n = 2320$	2038	87.8	9.90	(7.59)	136	5.9	13.57	(8.43)	71	3.1	15.89	(8.25)	75	3.2	19.81	(10.55)
Sexual abuse $n = 2322$	2008	86.5	9.70	(7.54)	141	6.1	15.20	(7.94)	120	5.2	15.21	(8.26)	53	2.3	23.45	(8.75)
Emotional neglect $n = 2319$	1382	59.6	9.04	(7.15)	638	27.5	12.25	(8.51)	137	5.9	14.84	(8.32)	162	7.0	13.96	(9.81)
Physical neglect $n = 2307$	1336	57.9	9.67	(7.50)	445	19.3	10.65	(7.97)	315	13.7	12.25	(8.59)	211	9.1	13.81	(9.57)

Note. OPD-SQS = Operationalized Psychodynamic Diagnosis - Structure Questionnaire Short. CTQ = Childhood Trauma Questionnaire.

countries are needed.

The present study shows a clear association between impairments of personality functioning and different types of CM. However, there does not always seem to be a direct dose-response relationship. All types of CM showed increases in impairments of personality functioning with increasing severity of CM, but to a different extent. Sexual abuse showed

a large increase in impairments in personality functioning, especially for severe sexual abuse. It should be noted that if someone experienced severe sexual abuse, they will probably also have experienced other CM types like emotional abuse or emotional neglect. Therefore, it can be assumed that in this cases multiple CM are especially often. An alternative consideration is that the type of CM might have a differential

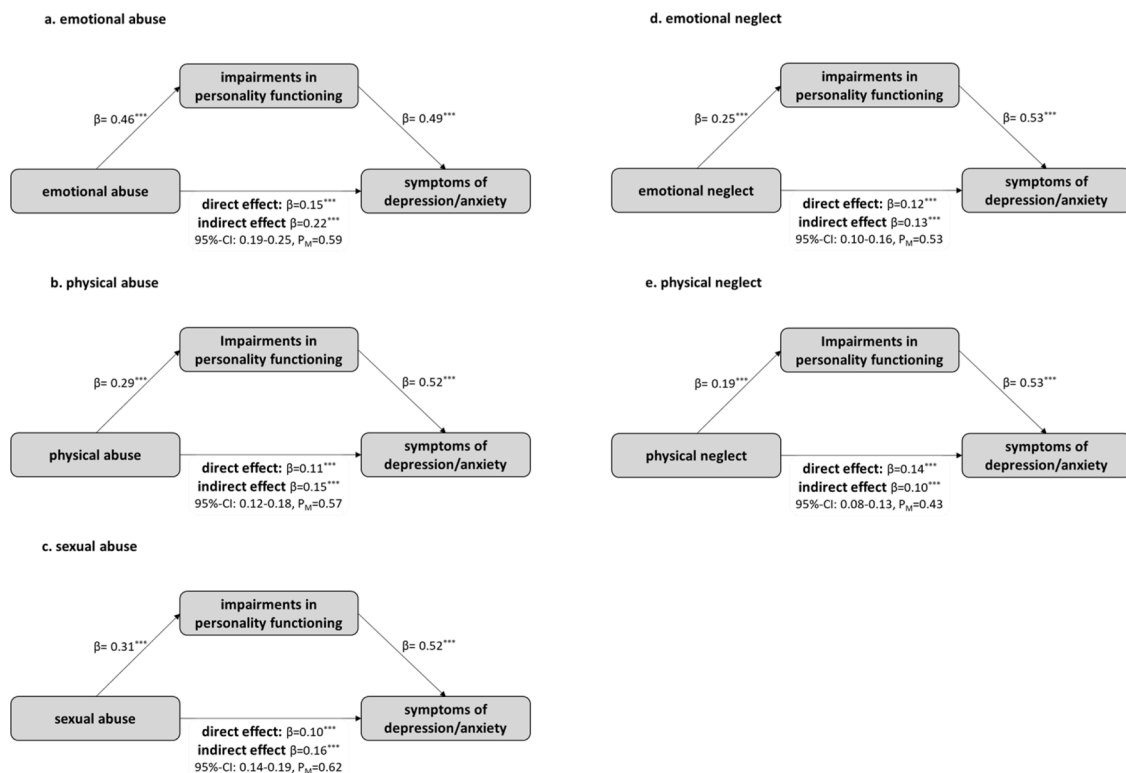


Fig. 3. Mediating model of personality functioning in the relationship between CM and depression/anxiety symptoms. Standardized β -coefficients are reported. Note. * $p < .05$; ** $p < .01$; *** $p < .001$; CI = confidence interval; P_M = proportion of the mediating effect as proportion of the total effect.

impact on the development of personality functioning. Previous findings suggest that different types of CM can predict the development of different types of psychopathologies in adults (Carr et al., 2020, 2013; Hengartner et al., 2013). For example, there was a particularly strong association between emotional abuse and bipolar disorder (Palmier-Claus et al., 2016). Therefore, it is possible that emotional abuse impairs different capacities of personality functioning than e.g., physical neglect.

Consistent with previous studies and meta-analyses, participants with more severe experiences in CM showed more severe depression/anxiety symptoms (e.g., Carr et al., 2020; Li et al., 2016). Moreover, impairments in personality functioning were also strongly associated with depression/anxiety symptoms. This might correspond to the fact that CM is associated with impairments in the emotional development (Harms et al., 2019) resulting in e.g. impaired emotional awareness and coping and also impaired personality functioning. Given that the emotional status is highly relevant for depression/anxiety and plays a key role in personality functioning, it might be – at least in part – one of the underlying mechanisms regarding the associations between CM, personality functioning, and depression/anxiety symptoms. Evidence has shown that personality functioning is modifiable through psychotherapy (Kraus et al., 2021; Leichenring et al., 2019; Lindfors et al., 2015), and therefore, it might prove useful to assess personality functioning in patients with depression/anxiety symptoms and a history of CM. Guidelines with specific implications for treatment planning with a focus on personality functioning (for OPD-2 see e.g. Ehrenthal and Benecke, 2019; Rudolf, 2020) or related approaches like mentalization-based therapy (Volkert et al., 2019) and schema therapy (Bach and Bernstein, 2019) could be used, emphasizing the clinical implications of assessing and treating impairments in personality functioning. If impairments in personality functioning are found, they should be regarded in the in the planning of psychotherapy as relevant elements. Further intervention studies are needed to prove the benefit for these patients.

4.1. Strengths and limitations

Some potential limitations must be acknowledged regarding this study. First, the findings are based on cross-sectional data, therefore, no interpretation of causal associations is possible. Hence, there is a need for further investigations of the theoretical considerations between CM, personality functioning and symptoms of depression/anxiety. Second, for depression/anxiety symptoms only screening measures were used in the survey. More detailed diagnostic assessment instruments exist for symptoms of depression/anxiety and could confirm our findings. Third, the results are based on retrospective self-reported CM. But there is evidence that retrospectively and prospectively assessed CM elevated the risk of psychopathology to a similar degree (Scott et al., 2012). Furthermore, a recent study found that the risk for psychopathology (e.g., depression and generalized anxiety) linked to subjective reports of CM is high, regardless whether the reports are consistent with objective measures (Danese and Widom, 2020). Therefore, the influence of biases such as false negative or positive answers seems to be slight.

Major strengths of our study were the inclusion of different types of CM in the large population-based sample size. The representative sample allows limited transferability (generalizability) of this result, i.e., the transfer of the clinical observation to the “real life” population. Further, the extent of the mediation effect in our study was comparable to the clinical result, which suggests a stable effect. Lastly, this study included depression and anxiety symptoms, while other studies only investigated depression (Dagnino et al., 2020).

5. Conclusion

The present investigation adds to the evidence that the association between CM and depression/anxiety symptoms is mediated by personality functioning, and that this association can be found in the general population as well as clinical samples. Our results show that the types of CM are of relevance as the mediating effects are slightly stronger in CM

abuse types (emotional, physical, and sexual) than in CM neglect types (emotional and physical). Knowledge about impaired personality functioning in general as well as different types of impaired personality functioning might prove to be an angle for clinical interventions and inspire future research.

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Ethics

The study was approved by the Ethics Committee of the Medical Department of the University of Leipzig (ref: 297/16-ek). 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 of the European Society of Opinion and Marketing Research.

CRediT authorship contribution statement

Anna Freier: Conceptualization, Formal analysis, Methodology, Writing – original draft. **Johannes Kruse:** Project administration, Conceptualization, Data curation, Supervision, Writing – review & editing. **Bjarne Schmalbach:** Methodology, Writing – review & editing. **Sandra Zara:** Writing – review & editing. **Samuel Werner:** Writing – review & editing. **Elmar Brähler:** Data curation, Writing – review & editing. **Jörg M. Fegert:** Data curation, Writing – review & editing. **Hanna Kampling:** Project administration, Conceptualization, Supervision, Writing – review & editing.

Declaration of Competing Interest

All authors declare to have no conflict of interest.

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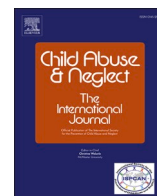
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4.4. PUBLIKATION IV

Ernst M, Brähler E, **Kampling H**, Kruse J, & Beutel M (2022)[#]. Is the end in the beginning? Childhood adversity increases the risk of non-suicidal self-injury and suicide attempts in adulthood through impaired personality functioning. *Child Abuse Negl* 133:105870. DOI: 10.1016/j.chiabu.2022.105870



Is the end in the beginning? Child maltreatment increases the risk of non-suicidal self-injury and suicide attempts through impaired personality functioning

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ABSTRACT

Background: Child maltreatment is a risk factor for a range of mental disorders later in life, including dangerous self-harm and suicide attempts. A better understanding of the mechanisms underlying this association can inform prevention and intervention.

Objective: To investigate personality functioning as a potential mediator of the association of childhood abuse and neglect and self-harm and suicide attempts in the general population.

Participants and setting: Data were drawn from a representative German population sample ($N = 2510$).

Methods: Participants filled out the Childhood Trauma Questionnaire (CTQ), OPD Structure Questionnaire (OPD-SQS), and items of the Self-Injurious Thoughts and Behaviors Interview (SITBI). In structural equation models, we operationalized impaired personality functioning as the mediator between childhood abuse and neglect and self-harm.

Results: Individuals with a history of self-harm (combining suicide attempts, $N = 47$, and non-suicidal self-injury, $N = 83$) reported more childhood abuse and neglect ($d = 1.39$, $p < .001$) and greater impairments in personality functioning ($d = 1.64$, $p < .001$) than the rest of the population. The indirect effect via personality functioning accounted for 48.8 % of the total effect of childhood abuse and neglect on self-harm. In more differentiated analyses, emotional abuse showed the strongest association with self-harm. Only physical and sexual abuse had direct effects.

Conclusions: The results specify the relationship between child maltreatment and self-harm by demonstrating that it is partly mediated by basic functions of personality assessed using a dimensional measure. These abilities constitute modifiable risk factors that can be addressed by psychotherapy.

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1. Introduction

Self-harm, which can be understood as “intentional self-poisoning or self-injury, irrespective of type of motive or the extent of suicidal intent” (Hawton et al., 2012, p. 2373) is a major mental health concern, being a main contributor globally to injury disability-adjusted life years (DALYs) and the second leading cause of death from injuries (Haagsma et al., 2016).

The World Health Organization estimates that >700.000 people die by suicide every year (World Health Organization, 2021) and the Centers for Disease Control and Prevention (CDC) estimate that the number of individuals attempting suicide is thirty times higher (Centers for Disease Control and Prevention, 2021). Self-harm thus constitutes an urgent mental health issue. The identification of risk and protective factors lies at the core of empirical research aimed at its prevention.

Some far-reaching risk constellations already exist at the beginning of life: Child maltreatment is a well-established risk factor for psychopathology in general and for suicidal behavior in particular (Brodsky & Stanley, 2008; Gilbert et al., 2009; Sahle et al., 2021; Serafini et al., 2017). Even after controlling for other variables that characterize vulnerable families such as socio-economic deprivation, connections of adverse childhood experiences with self-harm and (more specifically) with attempted suicide or Non-Suicidal Self-Injury (NSSI) were shown within large community studies (Afifi et al., 2008; Dube et al., 2001; Enns et al., 2006; Stickley et al., 2020; Thompson et al., 2019) and patient samples (Ystgaard et al., 2004). Researchers highlighted especially strong effects of sexual abuse (Angelakis et al., 2020; Ernst et al., 2019; Wong et al., 2020) and emotional abuse (Miller et al., 2013; Schönfelder et al., 2021). Child abuse and neglect has been reported a leading behavioral risk factor, contributing to years of health life lost because of suicide and self-harm in Australia in 2003, 2011, and 2015 (AIHW (Australian Institute of Health and Welfare), 2019). However, child abuse and neglect are distal and imprecise risk factors as they affect relatively large proportions of the population, contrasting low numbers of individuals who deliberately harm themselves. For instance, in a community sample representative of the German population, 44 % of participants reported at least one adverse childhood event (Witt et al., 2019). Reports from other representative German samples found (lifetime) prevalence rates of only 3.1 % for NSSI (Plener et al., 2016) and 2.8 % for suicide attempts (Müller et al., 2016).

Hence, other variables which modify or transmit the impact of early adversity on self-harm later in life have come into focus. Respective analytical approaches are in line with the most influential current psychological conceptualizations such as the integrated motivational-volitional model of suicidal behavior (IMV model) which describes how risk and protective factors act together in complex ways as suicidal ideation and behavior unfold against a background of life stressors and vulnerabilities (O'Connor & Kirtley, 2018). Along these lines, studies have shown that child maltreatment shapes a person's development in fundamental ways by altering neurobiological, emotional, cognitive and intellectual, and social processes (e.g., Shonkoff et al., 2012; Teicher & Samson, 2016; Widom, 2014). As pointed out by Cattane et al. (2017), child abuse and neglect lead to alterations in the HPA axis, neuroplasticity, neurotransmission, and the endogenous opioid system. These are important links in the chain connecting child maltreatment with self-harm later in life (Sachs-Ericsson et al., 2016). Previously confirmed mediators between child maltreatment and later self-harm were symptom burden from other mental disorders (Brown et al., 2018), a higher number of comorbidities (Auerbach et al., 2014), PTSD symptoms (Weierich & Nock, 2008) and affective dysregulation (Allen et al., 2013; Muehlenkamp et al., 2010) including strong anger (Aas et al., 2017). Individual differences that acted as mediators comprised impulsivity, aggression and social dysfunction (Perez et al., 2016; Ryttilä-Manninen et al., 2018; Swogger et al., 2011) as well as general features of borderline personality disorder (Allen et al., 2013; Bach & Fjeldsted, 2017; Spokas et al., 2009).

Adopting a transdiagnostic perspective, it is striking that these mediators also represent hallmarks of impaired personality functioning. The concept of personality functioning has attracted attention (Zimmermann et al., 2019) in light of the inclusion of a dimensional assessment of personality functioning in both the DSM-5 (Morey & Hopwood, 2019) which contains the Level of Personality Functioning Scale (LPFS) (Bender et al., 2011) and the forthcoming ICD-11 (Tyrer et al., 2011). In each case, a score on a continuous scale yields an informative measure of impairment, reflecting the notion that all personality disorders constitute patterns of experience and behavior that are stable over time and over different situations and that do not allow for a flexible, adequate regulation of the self and interpersonal relationships. The conceptual foundation for differentiating levels of personality functioning was laid by Kernberg (1970, 1993) (originally using the term personality organization) who stressed the relevance of early relationship experiences for the development of basic mental capacities such as the formation of a stable identity, perception of reality, and adaptive coping behavior. Given that personality functioning usually develops in early childhood based on the child's interactions and experiences with their caregivers (Beebe et al., 2010), child maltreatment might disrupt this developmental process (Luyten et al., 2020). If the child does not experience caring, responsive parental behavior, they are more likely to struggle to develop a stable sense of self and identity, and to be able to engage in trusting, close relationships later in life (Fonagy et al., 2000). Respective impairments in personality functioning have been observed following early interpersonal trauma (Back et al., 2021). It has been pointed out that child abuse and neglect have the potential to interfere with identity development, destabilize interpersonal relationships and increase the risk of dissociative phenomena, leading to a higher load of stress and therefore self-harming behavior to counter it (Bourvis et al., 2017). Further, previous studies which explicitly assessed personality functioning or compared individuals with and without personality disorders have underlined its relevance for suicidal behavior. In psychological autopsy studies, the diagnosis of a personality disorder itself was a risk factor for death by suicide (Schneider et al., 2006; Schneider et al., 2008). Based on a German outpatient sample, Kampe et al. (2018) showed that greater impairments in personality functioning (measured with the Structured Interview of Personality Organization (STIPO) and the Structured Clinical Interview for the DSM-5 Alternative Model for Personality Disorders (AMPD)) correlated with higher numbers of suicide attempts and psychiatric hospitalizations. Likewise, outpatients with borderline personality disorder with a history of suicide attempts exhibited greater impairment in multiple domains of personality organization in the STIPO (such as self-directed aggression) than those without a history of suicide attempts. They were also more likely to report self-

injurious behavior (Baus et al., 2014). Particularly difficulties in affect regulation such as disinhibition and aggression were more common among those attempting suicide (Stringer et al., 2013) and dying by suicide (McGirr et al., 2007).

1.1. The present study

Considering the summarized previous evidence, impairments in personality functioning could be one of the ways in which childhood abuse and neglect are translated into self-harm, including suicidal behavior later in life. While both aspects, child maltreatment and impaired personality functioning, have been shown to elevate the risk for self-harm, no study to date has tested their proposed interplay within a statistical model. The present investigation addressed this research gap. Its aims were twofold:

- 1) To compare individuals with and without a history of self-harm (combining NSSI and suicide attempts) with respect to child maltreatment and personality functioning.
- 2) To test the assumption that impaired personality functioning mediates the association between child maltreatment and self-harm (combining NSSI and suicide attempts).

2. Methods

2.1. Participants and procedure

Data of a representative sample of the German population were collected by the independent demography research institute USUMA Berlin in 2016. First, 258 German regional areas were predefined using a reference system for representative studies in Germany provided by the Working Group of German Marketing Research Institutes (Arbeitskreis deutscher Markt- und Sozialforschungsinstitute). Target households within these regional areas were selected following a random route procedure. For multi-person households, one individual was randomly selected for a face-to-face interview by means of the Kish selection grid technique (Kish, 1949). A total of 2510 individuals took part (representing 51.2 % of 4902 households addressed; this coverage results not only from declined study invitations, but also cases in which nobody lived at the selected address, or residents had left for holidays or work). By comparisons with the Federal Statistical Office, the sample was representative of the German general population regarding age, gender, and level of education.

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. The survey was approved by the Ethics Committee of the Medical Faculty of the University of Leipzig (nr. 297/16ek). To be eligible, participants had to be at least 14 years of age and have sufficient German language skills. Anonymity in responses was guaranteed and after all participants provided informed consent. In the case of minors, informed consent was also obtained from a parent/legal guardian.

2.2. Data and measures

Sociodemographic information comprised age, gender, level of education, and income. It was assessed in the form of an interview. Equivalized household income was calculated according to the OECD (2011) guideline by dividing the household income through the square root of people in household and recoding the result into the following categories: 1 $\leq$ 1250€, 2 = 1250–2500€, 3 $\geq$ 2500€.

Further information was gathered using established, standardized self-report questionnaires that were independently filled out on paper.

The Childhood Trauma Questionnaire (CTQ) assesses experiences of emotional abuse (example item: “I felt that someone in my family hated me.”), physical abuse (example item: “People in my family hit me so hard that it left me with bruises or marks.”), and sexual abuse (example item: “Someone molested me.”) and emotional neglect (example item: “I felt loved” (reverse-scored)) and physical neglect (example item: “I didn’t have enough to eat.”) (Bernstein & Fink, 1998; Klinitzke et al., 2012). Participants are asked to rate each of the 28 items on a five-point Likert scale ranging from 1 = “never” to 5 = “very often”. The CTQ has been widely used in community samples and clinical practice and research. Previous investigations in representative German population samples confirmed its five-factor structure and internal consistencies ranging from Cronbach’s $\alpha = 0.55$ (physical neglect) to $\alpha = 0.89$ (sexual abuse) (Klinitzke et al., 2012). We also tested the subscales’ internal consistencies in the present sample (emotional abuse: $\omega = 0.83$, physical abuse: $\omega = 0.78$, sexual abuse: $\omega = 0.86$, emotional neglect: $\omega = 0.87$, and physical neglect: $\omega = 0.65$).

The 12-item short form of the OPD structure questionnaire (OPD-SQS) measures personality functioning with the three subscales self-perception, interpersonal contact, and relationship model. Participants are instructed to rate statements such as “When others know a lot about me, I often feel somehow controlled or observed.” using response options ranging from 0 = “does not apply at all” to 4 = “fully applies”. The sum score of the OPD-SQS ranges from 0 to 48, with higher scores indicating more severe impairment. Previous research in patient samples supported its construct validity and its three-factorial structure (Obbarius et al., 2019). The OPD-SQS showed good internal consistency ($\alpha = 0.88$) (Ehrenthal et al., 2015) and measurement invariance across age and gender (Ehrenthal et al., under review). In the present sample, the scale’s internal consistency was good as well (total: $\omega = 0.90$; subscales: self-perception: $\omega = 0.85$, interpersonal contact: $\omega = 0.77$, relationship model: $\omega = 0.81$).

Lifetime history of suicide attempts and NSSI were assessed using items drawn from the Self-Injurious Thoughts and Behavior Interview (SITBI) (Fischer et al., 2014; Nock et al., 2007). Lifetime NSSI was assessed by the question “Have you ever intentionally

harm yourself, without the intention to die?”. Lifetime suicide attempts were assessed by asking “Have you ever made an actual attempt to kill yourself in which you had at least some intent to die?”. The German version of the SITBI was previously tested in a clinical sample and showed good test-retest- and inter-rater reliability and high agreement with diagnoses of NSSI and suicidal behavior (Fischer et al., 2014).

2.3. Statistical analysis

General notes: In the present work, we used the sum score of the OPD-SQS in the main analyses to be connectable to past and future research using other measures of personality impairment which also yield a continuous score, but comprise other subscales/subdomains (such as the LPFS). Previous research has also advised against modeling the single subscales of the OPD-SQS separately (Obbarius et al., 2019).

Concerning the SITBI items, we summarize NSSI and suicide attempts under the umbrella term self-harm. We use this expression to highlight the commonality of these behaviors which is deliberate self-injury. The behavioral enactment of impulses represents the volitional phase, within the IMV model (O'Connor & Kirtley, 2018). By using self-harm as a summarizing term, we also acknowledge difficulties regarding the ascertainment of suicidal intent which includes ambivalence, changing motives over time, and interviewer/setting effects (O'Connor, 2021, pp. 19–21).

Descriptive statistics are reported as means and standard deviations or as numbers and percentages. *p*-Values represent two-tailed tests. In the case of unequal variances, we calculated group comparisons as Welch's *t*-tests. Due to the large sample size, even small differences can yield statistically significant results. As we also conducted multiple comparisons of the same or similar dependent variables (six using the CTQ sum score and its subscales and four using the OPD-SQS sum score and its subscales), we adjusted the alpha level in these cases using the Benjamini-Hochberg correction (Benjamini & Hochberg, 1995). Effect sizes and coefficients are interpreted following Cohen (1992). Analyses were conducted using R version 4.0.3. Due to very small amounts of missing data (<0.5 % per variable of interest), we used list-wise deletion.

Main analyses: The mediation models were tested using Structural Equation Modeling (SEM). To examine the proposed mediation effect, we calculated the total effect of child maltreatment on self-harm, the unmediated direct effect, and the indirect effect (via personality functioning). History of NSSI and suicide attempts were used as indicators of the latent variable self-harm. In model 1, the five subscales of the CTQ (emotional abuse, physical abuse, sexual abuse, emotional neglect, and physical neglect) were used as indicators of the latent variable child maltreatment. Each of these types of abuse and neglect was measured by the respective subscales' single items. In model 2, we tested the effects of each of the five subscales of the CTQ separately (omitting the higher-level latent variable child maltreatment). The measurement model for personality functioning comprised the three latent factors self-perception, interpersonal contact, and relationship model. Indicators of the latent factors were the single items of the respective scale of the OPD-SQS. NSSI and suicide attempts were indicators of the latent variable self-harm. Effects of age and gender were statistically controlled. The complete models were computed using diagonally weighted least squares (WLSMV) estimation (because they included two binary

Table 1
Sample characteristics.

Variable	Total sample: <i>N</i> = 2510
Sociodemographic information	
Women (<i>n</i> , %)	1339 (53.3)
Equivalized income (<i>M</i> , <i>SD</i>)	1.55 (0.55)
German Abitur (<i>n</i> , %)	543 (21.6)
Age (<i>M</i> , <i>SD</i>)	48.36 (18.22)
Childhood abuse and neglect (<i>M</i> , <i>SD</i>)	
CTQ sum score	35.46 (11.03)
CTQ subscale emotional abuse	6.83 (3.01)
CTQ subscale physical abuse	5.89 (2.35)
CTQ subscale sexual abuse	5.57 (1.99)
CTQ subscale emotional neglect	9.48 (4.43)
CTQ subscale physical neglect	7.69 (2.98)
Personality functioning (<i>M</i> , <i>SD</i>)	
OPD-SQS sum score	10.62 (8.73)
OPD-SQS subscale self-perception	1.75 (2.65)
OPD-SQS subscale interpersonal contact	3.38 (3.11)
OPD-SQS subscale relationship model	5.51 (3.81)
Self-harm (<i>n</i> , %)	
Suicide attempts	47 (1.87)
Non-suicidal self-injury (NSSI)	83 (3.31)

Note. CTQ: Childhood Trauma Questionnaire. OPD-SQS: 12-item version of the OPD-Structure Questionnaire.

endogenous variables, history of suicide attempts and history of NSSI). As the χ^2 - and χ^2/df -statistic have been shown to be sensitive to sample size (Bollen & Paxton, 1998), we used the following indices to evaluate model fit: Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA) and Standardized Root Mean Square Residual (SRMR). According to conventions, TLI and CFI values close to 0.95 or higher indicate a better fit, whereas RMSEA and SRMR should be 0.08 or smaller (Hu & Bentler, 1999; Schermelleh-Engel et al., 2003).

3. Results

3.1. Sample description

The survey was completed by 2510 participants (1339 women). Participant characteristics are presented in Table 1. In total, 110 individuals reported some form of self-harm. NSSI was reported by 83 participants whereas 47 participants reported previous suicide attempts. Twenty participants reported both, whereas 63 participants reported only NSSI and 27 participants reported only suicide attempts.

3.2. Group comparisons and correlations

We compared individuals with a history of self-harm to those without a history of self-harm with respect to childhood abuse and neglect and personality functioning (Fig. 1).

Individuals with a history of self-harm had considerably higher sum scores of the CTQ than those without ($M = 49.31$, $SD = 17.51$ vs. $M = 34.58$, $SD = 10.18$; $t(111,70) = 8.39$; $p < .001$, $d = 1.39$). This difference was observed for all subscales: emotional abuse ($M = 11.38$, $SD = 5.00$ vs. $M = 6.63$, $SD = 2.71$; $t(110,99) = 9.71$; $p < .001$, $d = 1.67$), physical abuse ($M = 8.36$, $SD = 4.33$ vs. $M = 5.77$, $SD = 2.14$; $t(111,57) = 6.24$; $p < .001$, $d = 1.14$), sexual abuse ($M = 7.97$, $SD = 5.15$ vs. $M = 5.45$, $SD = 1.62$; $t(110,02) = 5.08$; $p < .001$, $d = 1.32$), emotional neglect ($M = 12.80$, $SD = 5.48$ vs. $M = 9.32$, $SD = 4.32$; $t(115,44) = 6.54$; $p < .001$, $d = 0.80$), and physical neglect ($M = 9.09$, $SD = 3.95$ vs. $M = 7.62$, $SD = 2.90$; $t(114,69) = 3.81$; $p < .001$, $d = 0.50$). Besides the latter, all of these differences had large effect sizes. After applying the Benjamini-Hochberg correction, all comparisons were still statistically significant.

Individuals who reported self-harm also reported impaired personality functioning (Table 2): OPD-SQS sum score ($M = 22.78$, $SD = 9.13$ vs. $M = 10.08$, $SD = 7.66$; $t(111,81) = 14.11$; $p < .001$, $d = 1.64$). The largest difference was observed for the subscale self-perception ($M = 6.00$, $SD = 3.73$ vs. $M = 1.56$, $SD = 2.42$; $t(110,09) = 12.19$; $p < .001$, $d = 1.78$), followed by interpersonal contact ($M = 7.20$, $SD = 3.40$ vs. $M = 3.20$, $SD = 2.99$; $t(2473) = 13.57$; $p < .001$, $d = 1.33$), and relationship model ($M = 9.49$, $SD = 3.93$ vs. $M = 5.34$, $SD = 3.71$; $t(2471) = 11.46$; $p < .001$, $d = 1.12$). All of these differences had large effects sizes and remained statistically significant after the Benjamini-Hochberg correction.

Table 3 reports correlations of the CTQ and OPD-SQS. The strongest, although still moderately-sized correlations between the measures pertained to the OPD-SQS sum score and the CTQ subscale emotional abuse ($r = 0.046$, $p < .001$), the OPD-SQS subscale self-perception and the CTQ subscale emotional abuse ($r = 0.044$, $p < .001$) and to the OPD-SQS subscale self-perception and the CTQ sum

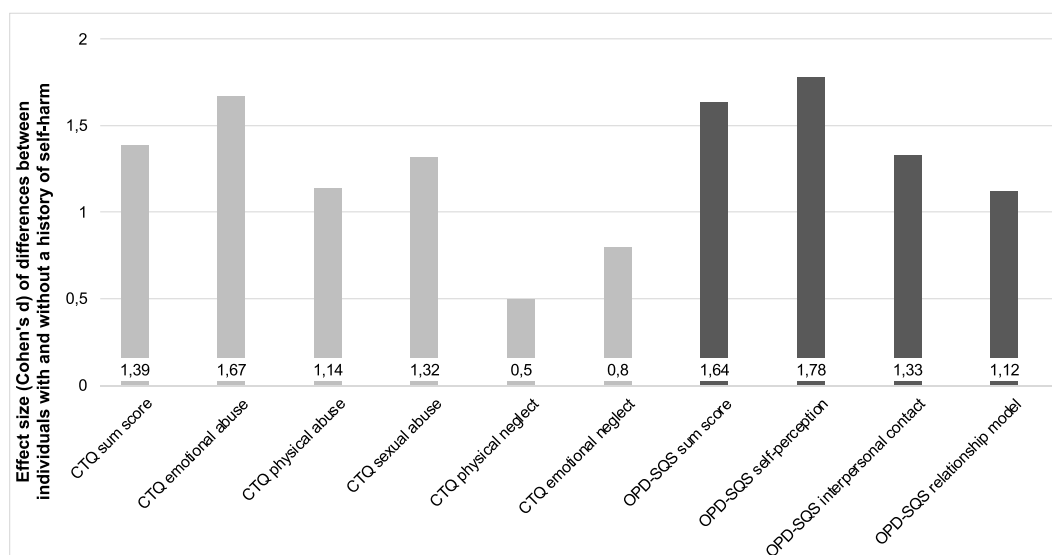


Fig. 1. Effect sizes of differences between study participants with and without a history of self-harm.

Generally, participants who had never deliberately injured themselves scored lower on the CTQ (light grey bars, indicating lower levels of abuse and neglect) and lower on all subscales of the OPD-SQS (dark grey bars, indicating better personality functioning). The largest differences pertained to the CTQ subscale emotional abuse and the OPD-SQS subscale self-perception.

Table 2

Comparison of study participants with and without a history of self-harm.

	Participants reporting self-harm (n = 110)		Participants not reporting self-harm (n = 2400)		<i>t</i>	<i>p</i>	<i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
CTQ sum score	49.31	17.51	34.58	10.18	8.39	<.001	1.39
CTQ emotional abuse	11.38	5.00	6.63	2.71	9.71	<.001	1.67
CTQ physical abuse	8.36	4.33	5.77	2.14	6.24	<.001	1.14
CTQ sexual abuse	7.97	5.15	5.45	1.62	5.08	<.001	1.32
CTQ emotional neglect	12.80	5.48	9.32	4.32	6.54	<.001	0.80
CTQ physical neglect	9.09	3.95	7.62	2.90	3.81	<.001	0.50
OPD-SQS sum score	22.78	9.13	10.08	7.66	14.11	<.001	1.64
OPD-SQS self-perception	6.00	3.73	1.56	2.42	12.19	<.001	1.78
OPD-SQS interpersonal contact	7.20	3.40	3.20	2.99	13.57	<.001	1.33
OPD-SQS relationship model	9.49	3.93	5.34	3.71	11.46	<.001	1.12

Note. In the case of unequal variances, group comparisons were calculated as Welch's *t*-tests. . CTQ: Childhood Trauma Questionnaire. OPD-SQS: 12-item version of the OPD-Structure Questionnaire.

score ($r = 0.042$, $p < .001$).

Before conducting the main analyses, we plotted the observed data to explore whether the association of childhood abuse and neglect with self-harm varied according to participants' impairments in personality functioning (OPD-SQS sum score) (Fig. 2). The likelihood to report self-harm increased with both higher CTQ and OPD-SQS scores.

3.3. Main analyses

Mediation model 1: Simple mediation model. The structural model is depicted in Fig. 3. It fit the data well (CFI = 0.94, TLI = 0.94, RMSEA = 0.04, SRMR = 0.06). The latent variable child maltreatment had a highly significant, positive effect on impaired personality functioning ($\beta = 0.52$, $p < .001$). Furthermore, impaired personality functioning was related to self-harm ($\beta = 0.38$, $p < .001$). The total effect of child maltreatment on self-harm was highly significant ($\beta = 0.41$, $p < .001$) and almost half of this effect (48.8 %) was mediated via impaired personality functioning. There also remained an unmediated, direct effect of child maltreatment on self-harm ($\beta = 0.21$, $p < .001$).

Mediation model 2: Testing differential effects of different types of childhood abuse and neglect. Within this model (Fig. 4), direct and indirect associations with self-harm were estimated separately for all five types of abuse and neglect. A formal comparison showed that it fit the data better than model 1 ($\Delta\chi^2 = 209.61$, $df = 13$, $p < .001$; CFI = 0.96, TLI = 0.95, RMSEA = 0.04, SRMR = 0.04). Not all types of child maltreatment had associations with self-harm. Statistically significant total effects were only observed for emotional abuse ($\beta = 0.55$, $p = .002$), physical abuse ($\beta = 0.21$, $p < .003$), and sexual abuse ($\beta = 0.35$, $p < .002$). There was no statistically significant direct effect of emotional abuse on self-harm ($p = .65$). The mediated effect via personality functioning was $\beta = 0.21$, $p = .002$.

In contrast, sexual abuse had a direct effect on self-harm ($\beta = 0.27$, $p < .019$). Its indirect effect via personality functioning ($\beta = 0.08$, $p < .004$) represented 24 % of the total effect. Physical abuse also had a direct effect on self-harm ($\beta = 0.17$, $p < .027$). Its indirect effect via personality functioning ($\beta = 0.04$, $p < .004$) accounted for 19 % of its total effect on self-harm.

4. Discussion

The aim of the present study was to advance the understanding of the role personality functioning plays in self-harm. Specifically, we tested the hypothesis that impaired personality functioning, which develops against a background of experiences of abuse and neglect in the individual's family of origin, serves as a mediator of the consistently reported, strong associations between child maltreatment and the behavioral enactment of self-destructive impulses (in the form of suicide attempts or NSSI) over the life span. To our knowledge, this is the first study to empirically test a dimensional operationalization of personality pathology as a mediator between these variables in a representative population sample (as opposed to, e.g., tests of associations with discrete diagnoses).

First of all, the present results highlight the importance of child protection (i.e., the prevention of child maltreatment – notably including emotional forms of abuse as well) as a crucial preventive measure against mental and physical morbidity over the life span (Brassard et al., 2019; Clemens et al., 2018; Fegert & Stötzel, 2016). Consistent with previous research reporting a strong association between childhood adversity and self-harm (Angelakis et al., 2020), we found that individuals with a history of self-harm reported both more childhood abuse and neglect (e.g., Sahle et al., 2021; Serafini et al., 2017) and greater impairment in personality functioning (Baus et al., 2014; Kampe et al., 2018). Therefore, our findings are also in line with the rich literature showing an association between child maltreatment and borderline personality disorder (Porter et al., 2020). The positive association of the CTQ sum score with self-harm further mirrors previous findings of cumulative effects of adverse childhood experiences (Afifi et al., 2008; Anderson et al., 2002; Miller et al., 2013). These findings underscore the need to disseminate knowledge of the long-term effects of child maltreatment and to advance child protection efforts (e.g., Fegert & Stötzel, 2016).

Going beyond these bivariate relationships, the first mediation analysis showed that almost half of the effect of child maltreatment on self-harm was mediated by impaired personality functioning. This finding suggests that personality functioning could be a useful

Table 3
Correlations between the Childhood Trauma Questionnaire and the OPD-SQS.

	CTQ sum score	CTQ emotional abuse	CTQ physical abuse	CTQ sexual abuse	CTQ emotional neglect	CTQ physical neglect	OPD-SQS sum score	OPD-SQS self-perception	OPD-SQS interp. contact	OPD-SQS relationship model
CTQ sum score										
CTQ emotional abuse	0.80									
CTQ physical abuse	0.74	0.63								
CTQ sexual abuse	0.56	0.46	0.46							
CTQ emotional neglect	0.84	0.54	0.44	0.27						
CTQ physical neglect	0.76	0.41	0.46	0.25	0.64					
OPD-SQS sum score	0.39	0.46	0.30	0.31	0.26	0.20				
OPD-SQS self-perception	0.42	0.44	0.30	0.31	0.30	0.26	0.80			
OPD-SQS interpersonal contact	0.35	0.41	0.26	0.27	0.25	0.20	0.88	0.66		
OPD-SQS relationship model	0.26	0.36	0.21	0.23	0.16	0.08	0.87	0.50	0.63	

Note. CTQ: Childhood Trauma Questionnaire. OPD-SQS: 12-item version of the OPD-Structure Questionnaire. All correlations were highly significant ($p < .001$).

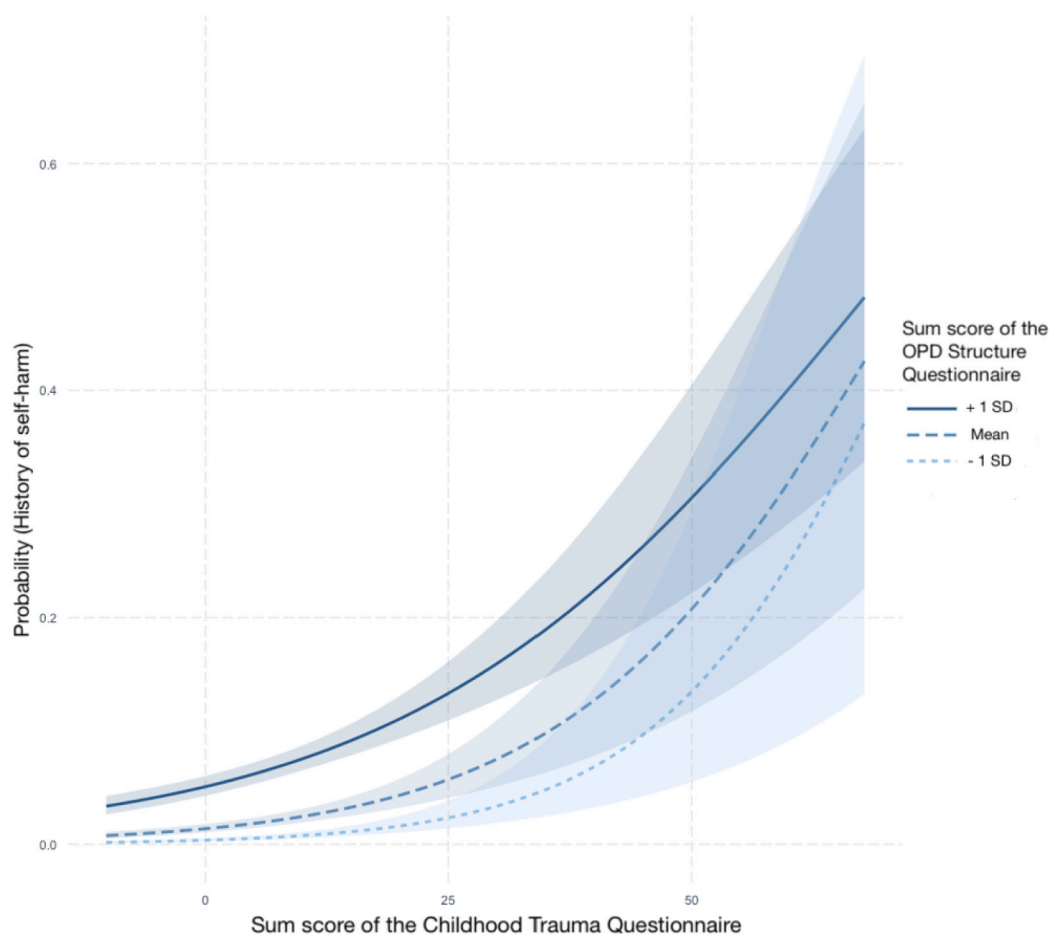


Fig. 2. Plot of the observed data: Prediction of self-harm (history of suicide attempts and/or self-harm) by the sum score of the Childhood Trauma Questionnaire (CTQ) at different levels of personality functioning (OPD-SQS; with higher values indicating greater impairment). Confidence bands indicate 95 %.

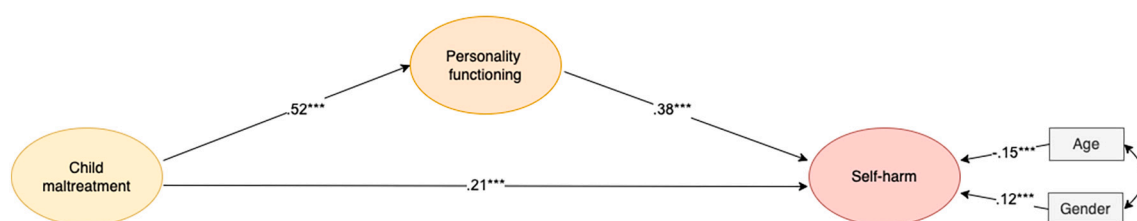


Fig. 3. Visualization of the first, simple mediation model (depicting the structural mediation model with covariates and standardized regression coefficients): The effect of child maltreatment on self-harm was partly mediated by impaired personality functioning. The indirect effect ($\beta = 0.20, p < .001$) made up 48.8 % of the total effect ($\beta = 0.41, p < .001$).

Fit indices: CFI = 0.94, TLI = 0.94, RMSEA = 0.04, SRMR = 0.06. Asterisks indicate significance levels: $p < .05$: *, $p < .01$: **, $p < .001$: ***.

target for the screening of potentially vulnerable individuals and also for intervention efforts – like other previously identified mediators that can be modified by psychotherapy, e.g., self-esteem (Cero & Sifers, 2013; Dinger et al., 2017) (which has also been conceptualized as a dimension of personality functioning (Ehrenthal & Benecke, 2019; OPD Task Force, 2008)) and cognitive processing styles (Liu et al., 2013). Cloitre et al. (2019) suggested that interventions that improve emotion regulation skills could be particularly helpful for survivors of child maltreatment. Interestingly, it has recently been shown that adolescents with a history of childhood adversity could benefit even more from a specialized cognitive-behavioral program (Taylor et al., 2011) aimed at decreasing self-harm than adolescents without such a history (Edinger et al., 2020).

Although personality functioning consolidates over the course of life and is generally considered a sum of stable, trait-like mental

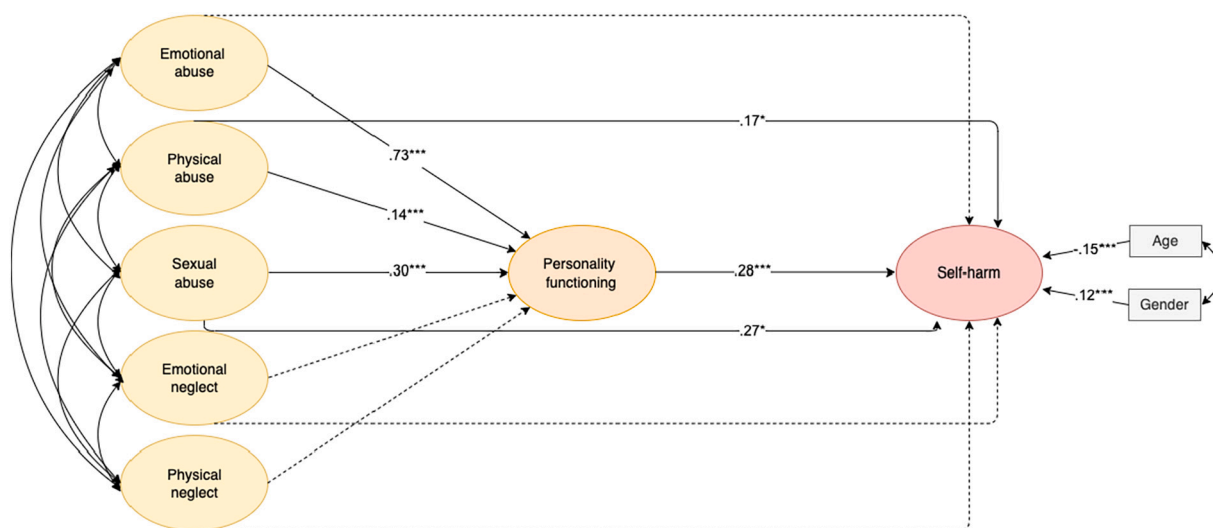


Fig. 4. Visualization of the second mediation model testing differential effects of emotional, physical, and sexual abuse and emotional and physical neglect. Depicted is the structural mediation model with covariates and standardized regression coefficients of statistically significant associations (insignificant associations are indicated by dashed lines). Emotional, physical, and sexual abuse had independent associations with self-harm. Physical and sexual abuse were the only kinds of child maltreatment which showed relevant direct, unmediated effects.

Fit indices: CFI = 0.96, TLI = 0.95, RMSEA = 0.04, SRMR = 0.04. Asterisks indicate significance levels: $p < .05$: *; $p < .01$: **; $p < .001$: ***.

capacities, it can be positively influenced by profound, helpful experiences such as psychotherapy (Ehrenthal & Benecke, 2019). Research has shown changes in the overall level of personality functioning in the context of long-term therapy (e.g., Leuzinger-Bohleber et al., 2019; Lindfors et al., 2019). Interventions specifically aimed at improving patients' personality functioning, including mentalization-based therapy (an integrative psychotherapeutic approach that focuses on enhancing how people perceive and understand psychological processes – such as feelings, desires, and expectations – in oneself and others as the cause of actions) (Stoffers-Winterling et al., 2022) could thus be beneficial for survivors of child maltreatment at risk for suicidal thoughts and behaviors. They promote self-efficacy and emotional perception and regulation (see e.g., Schechter et al., 2019) and foster the differentiation of mental representations of the self and others (Luyten et al., 2013).

The separate analysis of emotional, physical, and sexual abuse and emotional and physical neglect yielded further insights. First, the results corroborated findings from both high-risk clinical and population samples (Miller et al., 2013; Thompson et al., 2019; Ystgaard et al., 2004) conveying that different types of neglect and abuse are independently related to suicide attempts and NSSI. Our results also mirror previous research stressing particularly strong effects of sexual and emotional abuse (Janiri et al., 2018; Miller et al., 2013; Schönfelder et al., 2021). The specific association between emotional abuse and self-harm corresponds to the findings of Thomassin et al. (2016), reporting a similar association from a sample of adolescent inpatients with NSSI. A recent meta-analysis of studies using the CTQ had reported that the association of emotional abuse and suicidal behavior was the comparatively strongest (Liu et al., 2017).

Secondly, the remaining direct effects indicated that physical and sexual abuse contributed to lifetime risk for self-harm in ways that were not fully captured by our operationalization of personality functioning. Respective direct, unmediated effects of sexual abuse were previously observed in studies that had examined indirect effects via others variables (e.g., anxiety and depression symptoms and social support) (Bahk et al., 2017), showing that they did not fully account for the link between abuse and self-harm either. However, with reference to previous research, there are candidates for mediators that could explain how specifically physical and sexual abuse elevate the risk for self-harm and suicide. In particular, assessments of aggression and impulsivity and acquired capability for suicide could be instructive: the management and inhibition of impulses (including aggressive impulses directed at the self) is no part of the OPD-SQS which instead focuses on mental representations of the self and one's relationships. This hampers its explanatory power in the present context as respective abilities were important risk factors for suicidal behavior (Baus et al., 2014; Stringer et al., 2013) and were verified as mediators of effects of childhood adversity (Brodsky & Stanley, 2008; Lippard & Nemeroff, 2020). Apart from this, experiences of abuse have implications for the so-called acquired capability for suicide, a risk factor for serious self-harm with and without suicidal intent. It describes fearlessness of death and pain and increased pain tolerance, both of which develop over time in individuals (repeatedly) exposed to violence, such as abuse, combat situations, or self-injurious behavior itself (Ribeiro et al., 2012). For instance, survivors of childhood physical and sexual abuse were found to have an especially high pain tolerance (Allbaugh et al., 2017). Hence, future research could combine more comprehensive measures of personality functioning with specific risk factors in order to develop more exhaustive explanatory models of self-harm.

4.1. Limitations

The main limitations of the present study pertained to small numbers of individuals with a history of self-harm (suicide attempts and NSSI), the methods of assessment, and its cross-sectional design. While the use of a representative population sample came with strengths (e.g., unbiased representation of the frequency of child maltreatment and distribution of personality characteristics in the general population), not all selected households yielded a participant, and it also implicated that only few individuals reported self-harm. Therefore, more research is needed that tests the role of personality functioning in larger community samples and/or clinical populations, also to investigate the open question of whether the observed associations are the same for those who report NSSI and those who report suicide attempts with considerable intent to die.

Both NSSI and suicide attempts were assessed using single items included in a self-report questionnaire. There was no further information (such as intent to die, thoughts/emotional state preceding suicide attempts and NSSI, or the aftermath of these experiences, including e.g., responses of friends and family) which could be obtained in a longer, structured clinical interview. Given that the previous study was a large-scale community survey, such methods of assessment were not feasible.

Childhood adversity was also assessed as a self-report. We could not validate any reports made in the Childhood Trauma Questionnaire against third-party data such as official reports of parental violence or neglect. However, first-person reports of interpersonal adversity have been deemed reliable (e.g., [Hardt & Rutter, 2004](#)) and within the scope of the present work, we focus on participants' mental representations rather than historical accuracy.

We already touched upon the limitations of the OPD-SQS short form. For future research concerning suicidal behavior, instruments capturing the omitted aspects of personality functioning might allow for an even more comprehensive understanding of its association with child maltreatment. To give examples, disinhibition of impulses is explicitly mentioned as a feature of low levels of functioning in the OPD-2 manual ([OPD Task Force, 2008](#)) and impulse control is part of the 95-item long form of the OPD structure questionnaire ([Ehrental et al., 2012](#)). In addition, criterion B of the AMPD lists personality trait facets which are summarized under five domains (negative affectivity, detachment, antagonism, disinhibition and psychoticism) ([Krueger, 2019](#)).

Lastly, the items of the SITBI inquire about lifetime suicide attempts and NSSI. It is possible that these behaviors, if reported, had occurred years or decades earlier and that respondents were not at risk of suicidal behavior or NSSI when they participated in our study. While personality functioning/impairment is assumed to be stable (e.g., [Skodol, 2018](#)) and therefore, analyses of relationships with lifetime self-harm are still informative, more research is needed that uses longitudinal designs and tests the predictive power of personality functioning.

5. Conclusions

The present study adds to the large body of evidence which shows that child maltreatment elevates the risk for self-harm later in life. Hence, suicide prevention needs to start early – by preventing developmental risk factors such as childhood abuse and neglect. Moreover, the present findings expand on previous research by integrating the concept of personality functioning (i.e., a dimensional operationalization of personality pathology) in research on self-harm and suicide and by empirically testing a theoretically-derived mediation model: As a considerable proportion of the effect of child maltreatment was mediated through impaired personality functioning, this points out a new target for prevention and intervention efforts. Especially the strong, detrimental effects of having grown up in an emotionally abusive home were reflected in the assessed mental self- and other-representations. However, more research is needed to understand the interplay of personality functioning with established, more specific risk factors such as acquired capability for suicide. Therefore, the recent advances in diagnostic systems which facilitate a dimensional assessment of personality pathology in a variety of samples open up opportunities for more comprehensive suicide research.

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Declaration of competing interest

None.

Data availability

Data will be made available on request.

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4.5. PUBLIKATION V

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Mentalization and dissociation after adverse childhood experiences

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Impairment of mentalization may impact coping strategies, regulation of affect and stress. The influence of impaired mentalization on dissociation in patients with adverse childhood experiences (ACEs) could be important for treatment strategies. The aim of this study is to assess the relationship between ACEs, mentalizing and dissociation in adult individuals. Sixty-seven patients with ACEs completed the Mentalization Questionnaire (MZQ), the Essener Trauma Inventory (ETI) and the Brief Symptom Inventory-18 (BSI-18). The SPSS PROCESS macro tool was applied to test if mentalization mediated the relationship of ACEs and dissociation. ACEs were significantly associated with higher dissociation ($\beta = 0.42$, $p < 0.001$) and lower mentalization ($\beta = -0.49$, $p < 0.001$). When mentalization was added to the model as a predictor, the association of ACEs with dissociation was no longer significant ($\beta = 0.11$, $p = 0.31$) and a statistically significant indirect effect was found ($\beta = 0.32$, 95% CI 0.16–0.47). The overall explained variance of dissociation notably improved after inclusion of mentalization (17.5% to 49.1%). Thus, the results indicated that the association of ACEs on dissociation was fully mediated by mentalization. Our results suggest that ACEs are associated with lower mentalization and higher dissociation. Lower mentalization was also associated with worse depression, anxiety, somatization and PTSD symptoms. These findings underline the increasing importance of early treatment of individuals affected by ACEs with a focus to foster the development of mentalization.

Dissociation is a mental process which allows an individual to tolerate distressed events by splitting off highly incoherent or overwhelming thoughts, memories and feelings¹. A disruption is a disconnection in the integration of consciousness, memory, identity, emotion, perception, body representation, motor control and behavior. It affects all areas of personality functioning and of the integration of self². The dissociative process could be understood as a primary response to stress related with morphological alterations in the brain and is linked with enhanced amygdala response to emotional cues and cognitive control^{2,3}. There is considerable evidence regarding the relationship between childhood abuse or neglect and dissociation symptoms in adulthood⁴ with in an earlier age of onset, as well as a longer duration of abuse and parental abuse significantly predicted higher dissociation scores⁵. Chronic exposure to a stressful environment may lead to several alterations⁵. In line with psychodynamic theory, experiences of childhood trauma play a crucial role in the etiology of psychiatric disorders and hence show somatic diseases epigenetic modifications of the glucocorticoid receptor gene on the stress response in several studies with individuals with childhood abuse⁶. Childhood abuse is regarded as an event so intense that it is impossible for the victim to integrate this experience on a symbolic level and thus fosters a pathological active formation of impaired personality functioning and affective forces⁶.

Thus, it is reasonable that such adverse childhood experiences (ACEs) might hinder the development of good mentalizing abilities. Mentalizing is defined as the process by which we make sense of each other and ourselves with forming beliefs about mental states of those with whom we interact and our own⁷.

Mentalization can be seen as an extension and complement to the theory of mind research and to other approaches of perspective shifting competency with a special consideration of the processing of biographically relevant relationship experiences. The clinical concept particularly focuses on the area of metacognitive access

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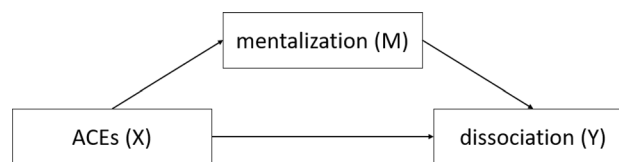


Figure 1. Theoretical model of the moderating effect of mentalization on the relationship of ACEs and dissociation.

to one's own self-states, attachment representations and interactions in affective contexts⁸. Mentalizing as a key aspect of social cognition is a highly complex ability based on two types of explicit and implicit mentalization⁹. Implicit is characterized by fast and intuitive, pre-reflexive and non-verbal information processing without awareness. The explicit form of mentalizing is relatively slow and relies on verbal and conscious information processing with cognitive skills⁹. In many previous studies the concept has been analyzed in relation to childhood trauma and dissociation. A significant interaction can be seen between adverse childhood experiences and attachment security with more post-traumatic stress disorder and trauma symptoms in those with insecure attachment representation¹⁰. Attachment style may play a role in precipitating and protecting against post-traumatic stress¹¹. Trauma is theorized to activate the attachment system, so there is a reciprocal relationship between attachment and trauma.

Mentalization is a dynamic multifaceted ability that has particular salience in the context of attachment relationship¹². Several studies documented trauma-induced neurobiological changes within the amygdala¹³, recognized as a primary locus of differentiated reactions to trauma and long-term socio-emotional consequences¹⁴. Neuroimaging studies show amygdala hyperactivity in individuals with acute trauma exposure heightened emotional response (e.g. hyperarousal, re-experiencing) and blunted emotional response (e.g. emotional numbing, dissociation) in cases of early and prolonged onset¹⁴. These blunted emotional responsiveness has been seen in mothers with unresolved trauma to infant distress¹⁵. Attachment trauma results in an increased amygdala response to salient stimuli¹⁶. For the child who is exposed to violence and abuse, there is hardly any opportunity to reflect on their own inner world as they are forced to concentrate exclusively on the external traumatic world¹⁷.

Emotional processes are linked to cognitive operations and reflective awareness with a language based broad spectrum of complex memory. Cognitive and executive functions are linked to mentalization identity narratives and mindfulness¹⁸. The relation of cognition and emotion with the underlying structure of personality might be important when considering personality functioning and vulnerability. Personality changes can lead to distinct impairments in self and interpersonal function¹⁹. Internalized early adverse experiences lead to corresponding inner working models that obstruct the functional regulation of dissociation. These mental processes might be modified in stressful circumstances and aggravate to difficulties.

It is reasonable to assume that the psychophysiological processes of mentalization may be involved in the dynamic of dissociation with its impact on imagination, our various verbal and conceptual information, as well as our interpersonal and subjective meaning made of perception. Individual differences in the mentalization process along with cognitive and emotional responses to dissociation and PTSD symptoms might be critical for both the construction of new management models as well as the development of novel treatment strategies. However, research in this field remains scarce. Thus, the aim of this study was to analyse the relationship between ACEs, mentalizing and dissociation in adult individuals (see Fig. 1). We hypothesized that participants with low mentalizing capacities may report more dissociation and emotional loading associated with psychological symptoms (anxiety, depression, somatization). Furthermore, we assume that mentalizing may be a mediator of the relationship between ACEs and dissociation in adulthood.

Materials and methods

Sample and procedure. This is a secondary analysis of data collected in a single center cross-sectional telephone-based interview study. Study participants for this study were recruited from a larger sample of a previous study²⁰. In this previous study, approximately 2600 general hospital patients were screened for experiences of domestic violence, ACEs, and a range of current physical and mental health problems. Among the previous participants who consented to being contacted for future studies, we identified those with experiences of interpersonal violence and randomly drew an age- and sex-matched control sample who had reported neither domestic violence nor ACEs. Further details on study procedures can be found in the previous publication²¹. The study design was in accordance with the Declaration of Helsinki (1964) and its later amendments and was approved by the research ethics committee of the Medical University of Innsbruck (1108/2020).

Measures. *Maltreatment and Abuse Chronology of Exposure Scale (MACE).* Adverse childhood experiences (ACEs) were assessed with the German version of the *Maltreatment and Abuse Chronology of Exposure Scale (MACE)*²². It consists of 75 items that retrospectively assess the severity of exposure to ten types of maltreatment during each year of childhood and adolescence up to age 18. For each year separately, participants are asked to endorse whether maltreatment occurred during that particular year of their life or not. Thus, onset and cumulative exposure are measured. The MACE provides an overall severity score and multiplicity score (number of types of maltreatment experienced) and has good test-retest reliability and validity²². The internal consistency for the MACE total score was excellent ($\alpha=0.92$).

Essener Trauma Inventory (ETI). To assess trauma-related symptoms, the symptom list of the Essener Trauma Inventory (ETI) was used. The symptom list of the ETI consists of 23 items rated on a four-point Likert scale. A total score (range: 0 to 69) and four subscales (dissociation; intrusion; avoidance; hyperarousal) can be calculated, with higher values indicating more distress. Values > 16 on the ETI total score indicate a notable distress level and values > 27 a clinically relevant level of PTSD symptoms. Good internal consistency and validity have been reported for the total score and for the four subscales²³. An excellent internal consistency ($\alpha = 0.93$) for the ETI-total score was found in our sample.

Brief Symptom Inventory (BSI). Psychological distress was assessed with the Brief Symptom Inventory (BSI-18), consisting of 18 items rated on a four-point Likert scale (from “not at all” to “very often”). A total score and three subscale scores (depression, anxiety, somatization) can be calculated. Good reliability and validity for the subscales and total score have been reported. In our sample, excellent internal consistency was found for the BSI total score ($\alpha = 0.92$) as well as for the anxiety ($\alpha = 0.80$) and depression ($\alpha = 0.85$) subscales.

Mentalization Questionnaire (MZQ). The validated German version of the Mentalization Questionnaire (MZQ) was used to assess the participants self-rated mentalizing²⁴. It consists of 15 items rated on a 5-point Likert scale (from “totally disagree” to “totally agree”). A total score can be calculated with higher score indicating robust and lower scores impaired mentalizing²⁴. Good internal consistency and validity has been reported for the total score of the MZQ²⁴. A good internal consistency for the MZQ total score was observed in our sample ($\alpha = 0.84$).

Statistical procedure. Sample characteristics and distribution of mentalization are presented by descriptive statistics. Differences in mentalization, trauma-related symptoms (ETI subscales) between patients with and without ACEs were investigated with independent sample t-tests. Associations of mentalization with dissociation, trauma-related symptoms (ETI subscales), and psychological distress (BSI subscales) were assessed by calculation of Pearson correlation coefficients. Effect sizes of $r > 0.1$ and $d > 0.2$ were considered small, while $r > 0.3$ and $d > 0.5$ indicated a medium, and $r > 0.5$ and $d > 0.8$ a large effect, respectively.

To investigate if mentalization mediates the association between ACEs and dissociation, the SPSS PROCESS macro tool based on the mediation method with 10,000 bootstrap bias-corrected 95% confidence intervals (CI) was used as recommended by Hayes²⁵. In this approach, the indirect effect (i.e., the mediation) is statistically significant if the bootstrapped 95% CI does not include the value zero. Direct and indirect effects are presented as standardized coefficients. R^2 represents the explained variance of the variable and is presented in percentage values. A priori sample size calculations indicated that a sample of $n = 68$ patients should be large enough to detect associations of medium effect size ($f^2 = 0.15$; $\alpha = 0.05$; $1 - \beta = 0.8$) in a multiple regression setting with two predictors. Sample size calculations was performed with G*Power (v3.1) and statistical analyses with IBM SPSS (v22.0). P-values < 0.05 (two-sided) were considered statistically significant.

Statement of ethics. The study was conducted according to the guidelines of the Declaration of Helsinki, and approved by the Ethical Committee of the Medical University Innsbruck (1108/2020).

Informed consent statement. Informed consent was obtained from all subjects involved in the study.

Results

A total of 102 participants were contacted between April 14th and 30th 2020, of which 67 (65.7%) agreed to take part in the study. Reasons for non-participation were lack of interest (60.0%), lack of time (22.9%), grave physical or mental health problems (8.6%), language barrier (2.9%), not wanting to conduct a phone interview (2.9%) or immediately hanging up (2.9%) (see Table 1). Participants and non-participants did not statistically differ in regard to previously assessed overall number of ACEs (2.0 vs. 2.7), domestic violence (6.9 vs. 6.3 points), age (48.5 vs. 43.4 years), or sex (female: 65.7% vs. 76.1%) (all $p > 0.05$).

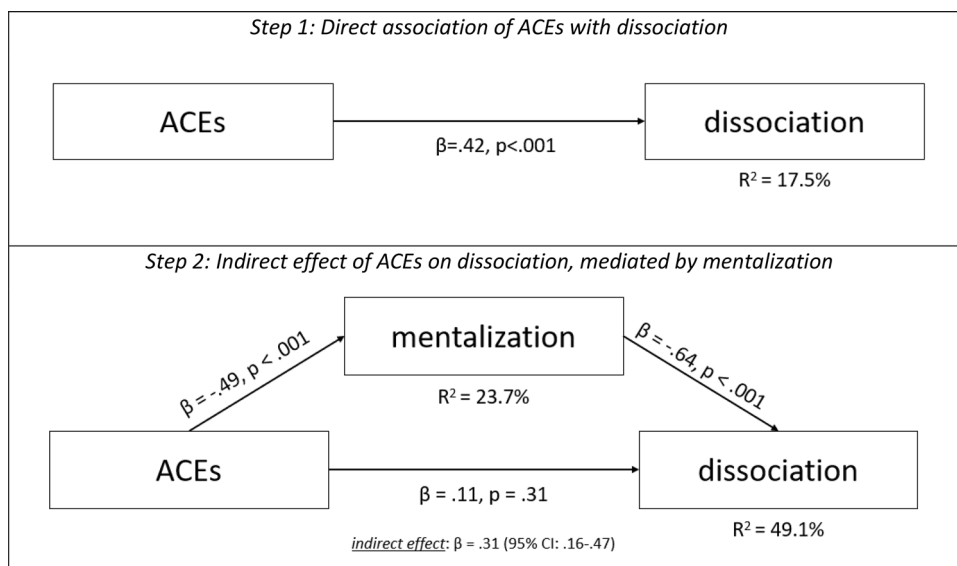
Mean age of the participants was 48.5 years, the majority was female (76.1%), living with their partner or family (62.7%) and about two thirds of the sample had children.

Association of mentalization with ACEs, dissociation, PTSD symptoms and psychological distress. Among the included patients, $n = 37$ patients (55.2%) reported no ACEs, while the remaining $n = 30$ (43.3%) reported one or more forms of ACEs. Mean ACE score was 2.0 (SD = 2.5) and patients reported a mean MZQ total score of 3.8 points (SD = 0.7). As for dissociation, a mean score of 3.0 (SD = 3.6) was found in the sample. Patients with ACEs showed a significantly decreased ability of mentalization with a large effect size (4.1 vs. 3.4 points; $t = 4.2$; $p < 0.001$; $d = 1.05$) and higher dissociation scores with a medium effect size (4.4 vs. 1.8 points; $t = 3.0$; $p = 0.005$; $d = 0.75$).

Mentalization and dissociation were highly significant correlated with a large effect size ($r = -0.70$, $p < 0.001$). Additionally, significant associations with large effect sizes could be observed between mentalization and all three PTSD-subscales (intrusion: $r = -0.53$; avoidance: $r = -0.70$; hyperarousal: $r = -0.60$; all $p < 0.001$) as well as with depression ($r = -0.64$; $p < 0.001$) and anxiety ($r = -0.64$; $p < 0.001$). The association of mentalization and somatization was also statistically significant with a medium effect size ($r = -0.46$, $p < 0.001$).

Mentalization as mediator between ACEs and dissociation. To test the association of ACEs, mentalization and dissociation, a mediation analysis was conducted. In a first step, the direct association of ACEs on dissociation was tested. ACEs were significantly associated with dissociation ($\beta = 0.42$, $p < 0.001$) and predicted

	Mean/n	(SD/%)
Age (years)	48.5	(13.6)
Gender		
Male	16	(23.9%)
Female	51	(76.1%)
Relationship status		
Single	16	(23.9%)
Married/long-term relationship	40	(59.7%)
Widowed	3	(4.5%)
Divorced/separated	8	(11.9%)
Living situation		
Living alone	20	(29.9%)
Living with partner/family	42	(62.7%)
Living with family of origin	4	(6.0%)
Living in shared apartment	1	(1.5%)
Parenthood		
Missing data	1	(1.5%)
Social class		
Lower class/working class	12	(17.9%)
Middle class	45	(67.2%)
Upper class	10	(14.9%)

Table 1. Sociodemographic data.**Figure 2.** Mediation analysis of the direct and indirect association of ACEs with dissociation, mediated by mentalization. ACEs = Adverse childhood experiences, β = standardized coefficient; R^2 = explained variance of the variable.

17.5% of its variance. In a second step, mentalization was added to the model as mediator between ACEs and dissociation. Higher ACE values were associated with lower mentalization scores ($\beta = -0.49, p < 0.001$) and predicted 23.7% of its variance. While mentalization was significantly associated with dissociation ($\beta = -0.64, p < 0.001$), the association of ACEs with dissociation was no longer significant ($\beta = 0.11, p = 0.31$) and the indirect effect was statistically significant ($\beta = 0.32, 95\% \text{ CI } 0.16-0.47$). The explained variance of dissociation notably increased to 49.1% when mentalization was included as mediator in the model. Thus, the data indicated that the association of ACEs on dissociation was fully mediated by mentalization. See also Fig. 2.

Discussion

The aim of our study was to assess the relationship between ACEs, mentalizing and dissociation in adult individuals. In our sample, there was a clear association of ACEs with dissociative symptoms. However, the direct association of ACEs on dissociation was not longer statistically significant when mentalization was added to the model as a mediator of said relationship.

In accordance with previous literature, we found a significant association between dissociative symptoms and mentalization, which can be understood as a dysfunctional adaptation process to a traumatic environment²⁶ with disruption of biobehavioral mechanism related to self and identity. Dysfunctional and maladaptive coping strategies influencing the stress response with so called stress depending changes from explicit to an implicit mentalizing process²⁷. A stress dependent switching from explicit to implicit mentalizing comes to bear when coping strategies are no longer sufficient to regulate personal stress arousal in the interaction with the attachment system.

From the perspective of mentalization theory, the typical emotion regulation in patients with a borderline personality disorder is seen as an imperfect balance between the cognitive and affective poles as well as the explicit and implicit mentalization poles. An individuals' on the effects of dysfunctional behavior on self and others is limited. In the case of interpersonal stress, it would be more functional if controlled and cognitive mentalizing (explicit) were available to the individuals. According to psychodynamic theory, a patient with a lower personality functioning based on maladaptive early attachment experiences shows symptom intensification and a lower therapy response²⁸. A broad range of research show that ACEs can be considered as a transdiagnostic factor with implications in a variety of emotional and functional disorders and problems²⁹. The impact of traumatic experience plays a key role in the regulation of distress based on the attachment system³⁰ with subsequent problems in mentalizing. Social embedded stress response may enforce the pathway between dissociation and mentalization in patients with attachment insecurity. This theory is supported by a recent study, which showed that attachment insecurity in combination with lower mentalizing mediated the link between childhood trauma and PTSD symptoms in adults who had experienced childhood neglect and abuse³¹. Early maltreatment may increase the risk for the development of attachment insecurity with long-lasting effects. The development of mentalizing is thought to be fostered by secure attachment relationship with a process of contingent mirroring of child's affects and subjective emotional experiences. This mental representation is important for strategies to regulate stress and to communicate with the self and the other³². Sharp et al. describe a social-cognitive model of PTSD and attachment insecurity with impaired mentalizing abilities mediating associations with dissociative experiences³³. Dissociative mental representations engendered by childhood trauma could be understood as as a dysfunctional adaptive function to minimize the fear of shame and guilty. The mentalizing ability could lead to a damping of this social-cognitive model of PTSD and dissociative experiences. Social embedded mentalizing may influence important aspects of individual function.

Our data also demonstrate that lower mentalization was associated with higher depression, anxiety and somatization as well as PTSD symptoms (avoidance, hyperarousal, intrusions). Depression and depressive symptoms with impairments in interpersonally transmitted information may be highly linked to mentalizing abilities based on developmental aspects of attachment and social relationships. A few empirical studies reported associations linking change in interpersonal functioning and attachment security with change in depressive symptoms³⁴. Relevant early developmental epigenetic modification of gene expression influences behavioral and emotional patterns in patients with depressive symptoms³⁵. This biobehavioral mechanism involved in problems related to self and identity should be a part of social capacity treatments. Interpersonal therapy focusing on helping patients to create or renew social contacts and social support may benefit from better mentalizing³⁶. Mentalization with its linkages to attachment theory offers possibilities for understanding the dynamics of depression regarding differences in severity and course of disease³⁷. Functional domains, that are often impaired in patients with ACEs, include personality functioning, affective, cognitive and self-regulatory resources as well as the quality of the self-other representation³⁶. These functional domains are important for the dynamic interplay of meaningful relationships.

Somatization refers to psychological stress caused by the perception of physical dysfunctions focusing on body symptoms with strong autonomous mediation³⁸. Subjective perception, thoughts, emotions and behavior associated with the individual somatic status are sometimes clinically more important than a medical diagnosis³⁹. The specific weight for the patients' perception is a body-related cognitive ability or competence, justified from a neuroscientific and a health science perspective. Interoceptive awareness and conscious body-related self-regulation seems to be a basic function, which may serve in patients with ACEs as an important homeo-static/allostatic control⁴⁰. Subjective representations of illness determine the coping behaviors and consequently the illness outcome. Somatization thus may be viewed as a primary driver for higher perception, symptom reporting, health care use, symptom persistence, and negative treatment outcome⁴¹.

Internalized traumatic early experiences (as often the case when experiencing ACEs) may lead to corresponding working models and obstructions in the functional regulation of emotions with less flexibility and more adaptive personality patterns⁴². Overcontrol of emotions such as in the dissociative subtype of PTSD need effective treatments as fostering mentalizing with a top-down regulation⁴³ and strengthening the individuals capacity to feel and to simultaneously reflect on his or her feelings.

Impaired mentalization in individuals with posttraumatic symptoms is associated with more psychological distress and higher symptom perception⁴³. Similarly, individuals with ACEs and an insecure attachment style show more psychological stress and higher symptom load. The modulation of primary affective states into cognitive-affective key features is disrupted by attachment trauma with leading to impairments in the capacity for self-regulation and the capacity for accessing the adaptive functioning of the social imaginations in relation to the intersubjective self⁴². Understanding my inner world and the world of the other with mentalizing capacities can contribute to the understanding of psychological resilience.

We are essentially tied to who or what we consider ourselves to be. The images we make of our selves characterize who or what we are⁴⁴.

The present study has several strengths and limitations. A major limitation is the limited sample size. Even though the sample size calculations indicated that the sample was sufficiently powered to detect medium effect sizes and results indicated positive findings, results should be interpreted with caution with regard to a possibly reduced variability of the scales' scores. In addition, we did not assess attachment (insecurity) in our study. Given that previous research has shown the close association between ACEs, attachment and mentalization, attachment might be an important additional component in a mediation model addressing adult psychopathology. Future research should address the role of attachment in the interplay of childhood trauma, adult dissociation and mentalization as a mediator. To our knowledge, this is the first study to investigate the mediation effect of mentalization in the association between ACEs and dissociation, which is a major strength of this study. A second strength is the applied study methodology: in the present study carefully telephone-based structured interviews were conducted by highly trained specialists in psycho-traumatology. This approach was not only chosen to improve the quality of collected data, but also to guarantee safety of this highly vulnerable patient collective and to support affected persons if necessary.

Conclusion

The relationship between ACEs and dissociation is fully mediated by mentalization; this means that the important predictive factor for dissociation is not if you have been abused as a child, but rather how this abuse or neglect influenced your mentalization capabilities. We suggest that mentalizing is a helpful transtheoretical and transdiagnostic concept to explain vulnerability to dissociation and its treatment.

Additionally, this indicates that early treatment of individuals affected by ACEs with a focus to foster the development of mentalization could prevent from developing dissociative symptoms as an adult.

Social embedded treatment strategies with adaptive functioning of social imaginations in relation to inter and intrasubjective capabilities may foster a therapeutic outcome.

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Author contributions

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Epistemic trust and personality functioning mediate the association between adverse childhood experiences and posttraumatic stress disorder and complex posttraumatic stress disorder in adulthood

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Background: Adverse childhood experiences (ACEs) are associated with posttraumatic and complex posttraumatic stress disorder symptoms in adulthood (PTSD/cPTSD), as well as reduced epistemic trust (trust in the authenticity and personal relevance of interpersonally transmitted information) and impaired personality functioning. The present work aims to investigate the predictive value of epistemic trust—the capacity for social learning—on the mediating effect of personality functioning in the association of ACEs and PTSD/cPTSD.

Methods: We conducted structural equation modeling (SEM) based on representative data of the German population ($N = 2,004$). Personality functioning (OPD-SQS) was applied as a mediator between ACEs and PTSD/cPTSD (ITQ), while epistemic trust (ETMCQ) was added as predictor for OPD-SQS. TLI, CFI, and RMSEA (95%-CI) determined the models' fit.

Results: $N = 477$ (23.8%) participants reported at least one ACE and $n = 218$ (10.9%) reported ≥ 4 ACEs. Fit indices were good for both PTSD (TLI = 0.96;

CFI = 0.99; RMSEA = 0.06; 95%CI: 0.041–0.078) and cPTSD (TLI = 0.96; CFI = 0.99; RMSEA = 0.06; 95%CI: 0.043–0.081). ACEs were significantly associated with cPTSD ($\beta = 0.44$, $p < 0.001$) and PTSD ($\beta = 0.29$, $p < 0.001$), explaining 20 and 8% of its variance. Adding personality functioning as a mediator increased the explained variance of cPTSD and PTSD to 47 and 19% while the direct association between ACEs and cPTSD/PTSD decreased ($\beta = 0.21/\beta = 0.17$), thus, indicating a partial mediation. Including epistemic trust substantially increased the explained variance for personality functioning (41%) compared to ACEs as a single predictor (16%).

Conclusion: We add to previous research emphasizing the association between ACEs and PTSD/cPTSD symptoms. Offering insights on underlying mechanisms, we show that epistemic trust and personality functioning are relevant mediators. Since both are modifiable by psychotherapy, knowledge about the role of these constructs can inform research on psychotherapeutic interventions and prevention.

KEYWORDS

adverse childhood experiences, complex posttraumatic stress disorder, epistemic trust, mediator, personality functioning, posttraumatic stress disorder

Introduction

Adverse childhood experiences (ACEs) including child maltreatment and household dysfunction are a worldwide phenomenon (1), estimated to affect over 55 million children in Europe alone (2), and more specifically in Germany, about 44% (3) of the general population, making ACEs a global and highly prevalent problem. ACEs are defined as “childhood events, varying in severity and often chronic, occurring in a child’s family or social environment that cause harm or distress, thereby disrupting the child’s physical or psychological health and development” (4). There is a large body of evidence suggesting a close association between adverse experiences as a child and the development of physical health problems (5–8) and mental disorders (including psychological distress) (8–12) in adulthood.

With regard to mental disorders, posttraumatic stress disorder (PTSD) and borderline personality disorder (BPD) are most often associated with ACEs (13–17). However, specific symptoms often found in persons with PTSD and a history of ACEs led to significant conceptual changes. The ICD-11 considers different PTSD syndromes by adding a new diagnosis referred to as complex posttraumatic stress disorder (cPTSD), which is associated with repeated or prolonged experiences of traumatic events, resulting in specific additional symptoms such as impaired affect regulation, negative self-concept, and interpersonal problems (18, 19). The variety of PTSD symptoms (e.g., re-experiencing, avoidance, hyperarousal), additional

specific cPTSD symptoms (e.g., impaired affect regulation), as well as frequent comorbidities (e.g., depressive symptoms or substance abuse) result in a very heterogeneous population of patients with PTSD and cPTSD, causing intense individual distress and are closely linked to serious disability as well as increased morbidity and mortality (20–24).

The close association between ACEs and the development of PTSD and cPTSD during adolescence or in adulthood emphasizes the importance of broadening our understanding of the underlying pathways through which ACEs and mental health issues are linked. Research focusing on ACEs and how they increase the risk for adult psychopathology proposed various potential mechanisms including brain structure and function, epigenetic processes, gene expression to neuroendocrine, immune and neurotransmitter systems, as well as social cognition (25–27). Another focus has been on personality development which has gained much interest in recent empirical research. Patients with a history of ACEs often show e.g., impaired identity perception, interpersonal difficulties, or altered affect regulation (28). Given that experiences made in early childhood are essential for the development of personality functioning by shaping basic mental capacities or adaptive coping behaviors (29–32), personality functioning might be a pathway linking ACEs and adult psychopathology. Personality functioning (also referred to as “structure”) describes a person’s abilities directed toward the self (identity perception, self-regulation) and others (empathy, intimacy) in four domains related to capacities

of cognition/perception, regulation, communication, and attachment (33). Since personality disorders are closely linked to impaired personality functioning, the concept of personality functioning has been included as a dimensional measure of basic psychological capacities in both the DSM-5 (34) as well as the ICD-11 (35–37). The ICD-11 represents a radical change in the classification of personality disorders where former categorical descriptions are now replaced by a dimensional structure. Diagnoses of personality disorders are conducted in two stages by assessing (1) the severity level and (2) domain traits. Here, special regard has been given to the borderline concept that can be optionally assigned as a “borderline pattern” after severity levels have been determined (35). With regard to the also newly introduced diagnosis cPTSD, this becomes particularly interesting as both diagnoses show substantial overlaps, specifically in terms of self- and interpersonal problems (38). The ICD-11 allows for this by making it possible to assign both diagnoses at the same time. While both are strongly associated with ACEs, the diagnosis of cPTSD actually requires the presence of trauma and PTSD symptoms. Both diagnoses are to be distinguished by specific elements. While cPTSD “typically involves stable and persistent patterns of negative self-perception while emphasizing avoidant interpersonal patterns,” the borderline pattern differs by allowing “an unstable or internally contradictory sense of self, which may involve both overly negative and overly positive self-views” (38).

Secure relationships and attachments alongside adequate emotional mirroring processes facilitate the development of personality functioning in early childhood (39). Given that personality functioning develops at a young age (29, 40, 41), it becomes obvious that ACEs (e.g., in form of maltreatment carried out by care-givers or attachment disruptions) might hamper and disrupt this developmental processes (42, 43), and thus, result in impaired personality functioning. Based on pioneering work by Sperber et al. (44) and Wilson and Sperber (45), Fonagy and Allison emphasize that secure attachment relationships are not only highly relevant for the development of personality functioning in infancy, but also for the development of the capacity of epistemic trust (46–48). Epistemic trust describes the “trust in the authenticity and personal relevance of interpersonally transmitted knowledge about how the social environment works and how best to navigate it” (49), or in other words, an “individual’s willingness to consider new knowledge from another person as trustworthy, generalizable, and relevant to the self,” in short: for social learning (47). In case of ACEs—especially if they occur in severe and regular form—a child’s early environment is characterized by unreliable or even malevolent caregiving experiences causing disrupted learning about the social world, and thus, resulting in a breakdown or underdevelopment of epistemic trust. Epistemic mistrust can cause uncertainty and continued epistemic vigilance that can manifest as the overinterpretation of other people’s motives

(48, 49). In a state of epistemic hypervigilance, one will assume that the other’s intentions are deviating from those declared, having them treat the source of the information as not deferential (48). Also, the content of the information may be rejected and its meaning confused or misinterpreted as being malignant. Such failings in social communication might originate from epistemic hypervigilance, epistemic mistrust, or even epistemic freezing, with the latter describing the inability to trust others as a source of information regarding the world and its workings (49). In short, “epistemic mistrust manifests as the misattribution of intention and the assumption of malevolent motives behind another person’s actions, and therefore treating them with epistemic hypervigilance (or conversely, in some instances, excessive inappropriate epistemic trust or credulity)” (48). Fonagy and colleagues suggest that these might be characteristics of many patients with trauma and personality problems, and that many “types of psychopathology might be characterized by temporary or permanent disruption of epistemic trust and the social learning process it enables” (49).

Following this line of thinking, epistemic trust might have a relevant predictive influence on a person’s level of personality functioning. However, to our knowledge there is no research assessing the role of epistemic trust in the association between ACEs, personality functioning and PTSD and cPTSD respectively. Therefore, the present work aims to investigate the predictive value of reduced epistemic trust on the mediating effect of impaired personality functioning in the association between ACEs and PTSD and cPTSD. We hypothesize, (I) that in line with previous research, experiences of ACEs relate to higher rates of PTSD and cPTSD in the general population, (II) that ACEs correspond to greater impairment in personality functioning and epistemic trust, and finally (III) that personality functioning is a mediator regarding the association between ACEs and PTSD as well as cPTSD, and that epistemic trust will be a relevant predictor for personality functioning.

Materials and methods

Sample and setting

The present study is based on data from a representative sample of the German population collected by the independent demography research institute USUMA Berlin. Face-to-face interviews and self-report questionnaires were administered by trained interviewers between December 2020 and March 2021, yielding a total of $N = 2,519$ participants. Households within 258 predefined regions were selected by a random route procedure. In households with multiple persons, one person was randomly selected using the Kish-Selection-Grid. Inclusion

criteria were sufficient German language skills, an age ≥ 16 and informed consent before taking part in the study (in the case of minors, informed consent was also obtained from a parent/legal guardian). The survey 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. Regarding the beginning Covid-19-pandemic in Germany, all applicable hygiene regulations at that time were followed. Ethical approval was obtained by the Ethics Committee of the Medical Faculty of the University of Leipzig (no. 474/20-ek).

Measures

Adverse childhood experiences questionnaire

ACEs were assessed using the ACEs Questionnaire (50), which is a widely used self-report tool for retrospectively evaluating numerous early childhood adversities. It comprises 10 items regarding abuse (emotional, physical, and sexual), neglect (emotional and physical), separation of a parent, violence against the mother, as well as problems of a household member (substance use, mental disorder, and prison stay). Each item is answered with either yes (1) or no (0), resulting in a sum score between 0 and 10. The German version of the ACE has shown acceptable reliability, with Cronbach's $\alpha = 0.76$ (51). In our sample, a good internal consistency of the ACE items could be observed ($\alpha = 0.81$).

International trauma questionnaire

The ITQ is a brief self-report questionnaire to measure PTSD and cPTSD symptoms after a stressful life experience, also assessing whether diagnostic criteria of PTSD and cPTSD diagnoses according to ICD-11 are fulfilled (52). It comprises 18 items with response options ranging from 0 = "not at all" to 4 = "extremely." The three PTSD core symptom clusters (re-experiencing, avoidance, and sense of threat) and the additional three areas related to disturbances in self-organization (DSO) (affective dysregulation, negative self-concept, and problematic relationships) are measured by two items each. For a dimensional assessment, the three items for the PTSD core symptom clusters and DSO, respectively, can be summed up resulting in an ITQ-PTSD sum score and an ITQ-cPTSD sum score, respectively, ranging from 0 to 24. To assess a probable PTSD diagnosis, functional impairment for the PTSD core symptoms are considered with additional three items. A probable PTSD diagnosis is met if at least one item in each core symptom cluster and one item of functional impairment for PTSD is answered with ≥ 2 ("moderately"). A probable cPTSD diagnosis is met, if PTSD criteria are satisfied and additionally at least one item in each DSO area is answered with ≥ 2 as well as and one item of functional impairment for DSO is answered

with ≥ 2 . According to ICD-11 diagnostic guidelines, a person may receive a possible diagnosis for PTSD or cPTSD, but not both. For both scales, reliability was good with $\alpha = 0.84$ for the PTSD scale and $\alpha = 0.88$ for the cPTSD scale (53). The German version has been validated in a representative population-based sample and can be used for research and clinical practice (54). In our sample, good internal consistency was observed for both the PTSD ($\alpha = 0.89$) and cPTSD scale ($\alpha = 0.87$).

Operationalized psychodynamic diagnosis structure questionnaire-short form

The Operationalized Psychodynamic Diagnosis Structure Questionnaire-Short Form (OPD-SQS) (55) is a 12-item self-report questionnaire to assess the level of personality functioning. A total score ranging from 0 to 48 and a score for each of the three subscales (self-perception, interpersonal contact, and relationship model) ranging from 0 to 12 can be calculated. Higher values indicate more severe deficits in personality functioning. Good validity and reliability have been reported for the total scale, with Cronbach's $\alpha = 0.88$ (55). In our sample, good internal consistency was observed for the OPD-SQS total score ($\alpha = 0.91$).

Epistemic trust, mistrust and credulity questionnaire

The German Version of the Epistemic Trust, Mistrust and Credulity Questionnaire (ETMCQ) (56, 57) was used to assess the participants' levels of trust in communicated knowledge, i.e., epistemic trust. The ETMCQ consists of 15 items to measure the three independent subscales of the epistemic trust construct: epistemic trust, mistrust, and credulity. Examples for the respective scales are "I find information easier to trust and absorb when it comes from someone who knows me well" for epistemic trust, "If you put too much faith in what people tell you, you are likely to get hurt" for epistemic mistrust, and "When I speak to different people, I find myself easily persuaded even if it is not what I believed before" for epistemic credulity. Each item has a response option ranging from 1 = "strongly disagree" to 7 = "strongly agree," resulting in a sum score from 15 to 105. High trust reflects a persons' ability to be open to opportunities for social learning in relationships, while high mistrust indicates a tendency to treat information sources as unreliable and to rather avoid being influenced by communication from others. High credulity reflects a persons' lack of clarity about its own position, which can lead to high vulnerability to misinformation and exploitation by others. For the ETMCQ, good reliability and validity have been reported, with the internal consistency for the full scale ranging from Cronbach's $\alpha = 0.71$ to $\alpha = 0.78$. In our sample, good internal consistency was observed for the ETMCQ trust ($\alpha = 0.81$) and credulity ($\alpha = 0.80$) subscale, while the values for the mistrust subscale were somewhat questionable ($\alpha = 0.69$).

Statistical analyses

Demographics for the sample are presented with means and standard deviations (SD). Patients with >50% missing items in the ITQ, ACE scale, OPD-SQS or ETMCQ were excluded from the analysis. Sociodemographic and clinical data of the excluded sample was compared to the study sample using independent sample *t*-tests and χ^2 -tests. The effect of group differences was estimated using Hedges g' for metric and ϕ for nominal data. Values of $g' = 0.2/\phi = 0.1$, $g' = 0.5/\phi = 0.3$ and $g' = 0.8/\phi = 0.5$ represent small, medium and large effect sizes, respectively.

The relationships between ACEs, epistemic trust, personality functioning, and PTSD/cPTSD symptoms were investigated with structural equation models (SEM; see [Figure 1](#)). Missing data (<50% missing items) was imputed using the full information maximum likelihood (FIML) estimation, which is the default approach in AMOS. In model A, the direct influence of ACEs on PTSD/cPTSD symptoms in adulthood was tested. In model B, personality functioning as measured by the OPD-SQS total score was added to the model as a mediator for this relationship and the epistemic trust subscales were added as predictors for personality functioning. For sensitivity analyses, the model was also tested (a) in the complete sample with the assumption that all missing values equal the lowest possible symptom score and (b) in all participants without missing data in the ITQ cPTSD scale with the assumption that missing values in the ITQ PTSD scale represent the lowest possible symptom score.

To account for non-normal distribution of data, bootstrapped confidence intervals [5,000 samples, 95%

confidence interval (CI)] were calculated to evaluate the statistical significance of all included paths 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 was closely fitting the theoretical model, the *p*-value of Close Fit (PCLOSE) was calculated based on the RMSEA values, with values of $p > 0.05$ indicating close fit and $p < 0.05$ indicating worse than close model fit. Acceptable goodness of fit was defined as RMSEA values of <0.08 and CFI/TLI values >0.90. *p*-values < 0.05 (two-sided) were considered statistically significant. Statistical analyses were performed with IBM SPSS (v22.0) and SPSS AMOS (v24.0).

Results

A total of 2,519 persons participated in the study. Of these, $n = 515$ participants (20.4%) were excluded because of missing data in the ITQ (mainly the PTSD symptom scale), the ACE questionnaire, the OPD-SQS, or the ETMCQ. The remaining $n = 2,004$ patients were included in the final analysis. Participants' mean age was 51.3 years. The majority was female (52.5%), married (45.5%), had an education ranging from 10 to 13 years of school (57.1%), and were employed full time (41.4%). Most participants earned a net monthly household income between 1,500 and 2,499 € (31.7%). For more details on sociodemographic characteristics see [Table 1](#).

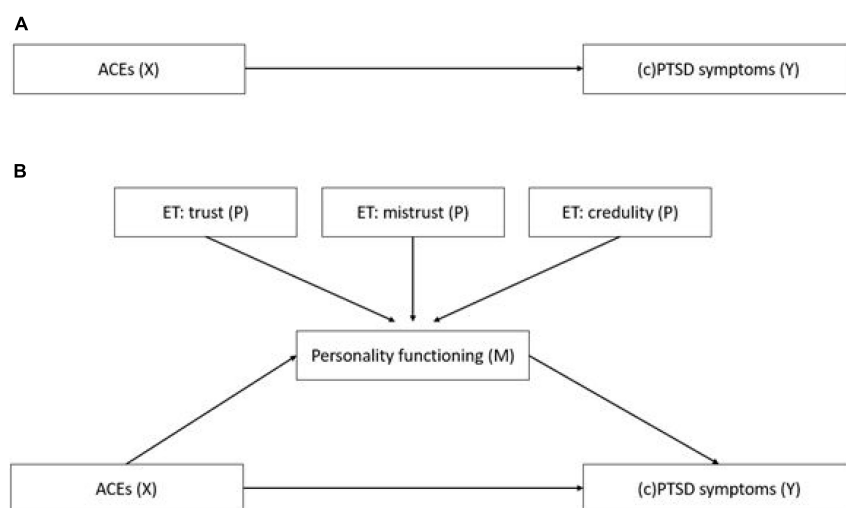


FIGURE 1

Structural equation models to test the mediation effect of personality functioning and epistemic trust on the relationship of ACEs with PTSD/cPTSD symptoms in adulthood. **(A)** Direct association of ACEs (X) and PTSD symptoms (Y). **(B)** Association of ACEs (X) and PTSD/cPTSD symptoms (Y), mediated by personality functioning (M), which was predicted by epistemic trust (P). Model A depicts the direct association of the independent variable ACEs (X) with the dependent variables PTSD and cPTSD respectively (Y). Model B depicts the model with personality functioning as a mediator (M) and the three epistemic trust subscales as predictors (P) for the mediator variable.

TABLE 1 Sociodemographic characteristics— $N = 2,004$.

	<i>N</i>	(%)
Sex		
Male	947	(47.3)
Female	1,053	(52.5)
Diverse	4	(0.2)
Age ($M = 51.3$; $SD = 18.1$)		
<30	325	(16.2)
30–39	245	(12.2)
40–49	307	(15.3)
50–59	418	(20.9)
60–69	348	(17.4)
> 70	361	(18.0)
Education		
<10 years	605	(30.2)
10–13 years	1,145	(57.1)
> 13 years	202	(10.1)
Other qualification	35	(1.7)
Missing	17	(0.8)
Relationship		
Married	911	(45.5)
Single	574	(28.6)
Divorced	291	(14.5)
Widowed	221	(11.0)
Missing	7	(0.3)
Employment status		
Full time	830	(41.4)
Part time	250	(12.5)
Unemployed	161	(8.0)
In training	112	(5.6)
Retired	626	(31.2)
Missing	25	(1.2)
Monthly net household income		
<1,500 €	471	(23.5)
1,500–2,499 €	636	(31.7)
2,500–3,499 €	457	(22.8)
> 3,500 €	440	(22.0)

Excluded patients were significantly younger (46.3 vs. 51.3 years; $p < 0.001$; $g' = 0.28$), more often full time employed (51.0 vs. 41.6%) and less often retired (19.3 vs. 31.4%) ($\chi^2 = 33.35$, $p < 0.001$; $\phi = 0.12$), more often single (35.6 vs. 28.7%) and less often widowed (4.3 vs. 11.1%) ($\chi^2 = 26.08$, $p < 0.001$; $\phi = 0.10$), had been in school longer ($\chi^2 = 11.66$, $p = 0.009$; $\phi = 0.07$), and reported less ACEs (0.6 vs. 1.0; $p < 0.001$; $g' = 0.24$). However, all differences were of small effect size. No significant difference was observed for gender ($\chi^2 = 1.06$, $p = 0.59$; $\phi = 0.20$) and monthly net household income ($\chi^2 = 19.14$, $p = 0.12$; $\phi = 0.09$).

In addition, Table 2 shows the mean number of ACEs experienced by the participants of the included sample as well mean values regarding personality functioning, epistemic trust, and PTSD and cPTSD symptoms.

TABLE 2 Mean numbers of ACEs as well as mean values of ITQ (symptoms of PTSD and cPTSD, respectively), OPD-SQS (personality functioning), and ETMCQ (epistemic trust)— $N = 2,004$.

	<i>M</i>	(<i>SD</i>)
ACE	1.0	(1.8)
ITQ		
PTSD	2.8	(4.2)
cPTSD	4.2	(5.7)
OPD-SQS		
total score	24.1	(9.4)
self-perception	6.3	(3.1)
interpersonal contact	7.9	(3.4)
relationship model	10.0	(4.3)
ETMCQ		
trust	24.7	(5.4)
mistrust	14.5	(4.5)
credulity	12.5	(5.1)

ACE, Adverse Childhood Experiences Questionnaire; ITQ, International Trauma Questionnaire; PTSD, posttraumatic stress disorder; cPTSD, complex posttraumatic stress disorder; OPD-SQS, Operationalized Psychodynamic Diagnosis Structure Questionnaire-Short Form; ETMCQ, Epistemic Trust, Mistrust and Credulity Questionnaire.

Prevalence and association of adverse childhood experiences and posttraumatic stress disorder as well as complex posttraumatic stress disorder in adulthood

A total of 1,309 (65.3%) participants reported no ACEs, while 477 (23.8%) had experienced 1–3 ACEs and the remaining 218 (10.9%) four or more ACEs [i.e., polytraumatized persons (58)]. The rates for PTSD and cPTSD symptoms above the cut-off were quite similar with a prevalence of 4.4% ($n = 88$) and 4.1% ($n = 83$), respectively.

A higher ACE score was significantly associated with higher scores for symptoms of PTSD ($r = 0.31$, $p < 0.001$) and cPTSD ($r = 0.44$, $p < 0.001$). Patients who were polytraumatized (i.e., four or more ACEs) in their childhood had 7.0-times increased likelihood to develop clinically relevant PTSD-symptoms (95%-CI: 4.0–12.1; $p < 0.001$) and a 14.8-times increased risk for clinically relevant cPTSD symptoms (95%-CI: 8.2–26.6; $p < 0.001$).

The association between personality functioning and epistemic trust with adverse childhood experiences and posttraumatic stress disorder as well as complex posttraumatic stress disorder in adulthood

In our sample, ACEs were significantly associated with lower personality functioning as well as higher scores for

epistemic mistrust and epistemic credulity as well as lower scores for epistemic trust. Additionally, participants with lower personality functioning reported higher PTSD and cPTSD scores. As for the epistemic trust subscales, higher epistemic credulity and mistrust were both significantly associated with higher PTSD and cPTSD symptoms. However, while lower epistemic trust was also associated with higher cPTSD symptoms, there was no significant association with PTSD symptoms (see also Table 3).

Personality functioning and epistemic trust as mediators of the relationship of adverse childhood experiences with posttraumatic stress disorder and complex posttraumatic stress disorder symptoms in adulthood

In the first step, the direct associations of ACEs with PTSD and cPTSD symptoms in adulthood were investigated by calculation of a SEM. ACEs significantly predicted PTSD ($p < 0.001$, $\beta = 0.31$, 95%-CI: 0.26–0.36) and cPTSD ($p < 0.001$, $\beta = 0.44$, 95%-CI: 0.39–0.49) symptoms and explained 8 and 20% of the variance, respectively. Since the number of distinct sample moments was equal to the number of distinct parameters to be estimated (i.e., resulting in zero degrees of freedom), no model fit indices could be calculated.

In the second step, the OPD-SQS total score was added as a mediator of the relationship between ACEs and PTSD/cPTSD symptoms, respectively, and the ETMCQ subscales were added as predictors for personality functioning. The overall explained variance substantially increased for PTSD (19%) and cPTSD (47%) and the direct association of ACEs with both PTSD ($\beta = 0.17$, 95%-CI: 0.12–0.23; $p < 0.001$) and cPTSD symptoms ($\beta = 0.21$, 95%-CI: 0.16–0.26; $p < 0.001$) was weakened. Epistemic mistrust ($\beta = 0.23$, 95%-CI: 0.18–0.28; $p < 0.001$) and epistemic

credulity ($\beta = 0.33$, 95%-CI: 0.29–0.38; $p < 0.001$) significantly predicted the OPD-SQS total score and explained 41% of the variance (for details, see Figures 2, 3).

A good model fit was found for the model with PTSD ($\chi^2 = 31.56$, $p < 0.001$; CMIN/DF = 7.89; CFI = 0.99; TLI = 0.96; RMSEA = 0.059, 95%-CI: 0.041–0.078; PCLOSE = 0.20) and cPTSD as dependent variables ($\chi^2 = 34.13$, $p < 0.001$; CMIN/DF = 8.53; CFI = 0.99; TLI = 0.96; RMSEA = 0.061, 95%-CI: 0.043–0.081; PCLOSE = 0.14).

For sensitivity analyses, both models were also calculated with (a) all missing items imputed as lowest possible score on the ITQ scales and (b) missing ITQ-PTSD items imputed as lowest possible scores for all participants with complete ITQ-cPTSD items. Since these calculations showed no difference in results, the initial analyses were considered reliable.

Discussion

Based on data of a representative survey of the German population, we examined the role of epistemic trust in the association between ACEs, personality functioning and PTSD as well as cPTSD, respectively.

Our results show that a third of our sample suffer from ACEs (about 24% had one to three and about 11% four or more ACEs), and about 4.1 and 4.4% fulfilled self-reported PTSD and cPTSD criteria, respectively. Higher ACE scores were significantly associated with higher scores for symptoms of PTSD and even more so for symptoms of cPTSD. In addition, multiple experiences of ACEs (>4 ACEs) were associated with a severely increased risk to develop PTSD (7.0-times) and cPTSD (14.8-times) in adulthood. We add to previous research demonstrating an association of ACEs and PTSD as well as cPTSD, emphasizing the importance of a persons' history of child maltreatment and adverse experiences for developing these psychopathologies (13, 15, 17, 59).

Consistent with our second hypothesis, we show that ACEs do indeed correspond to impairments in personality functioning but also higher epistemic mistrust and epistemic credulity, as well as reduced epistemic trust. Moreover, we demonstrate that impaired personality functioning as well as higher epistemic mistrust and epistemic credulity were significantly associated with increased PTSD and cPTSD scores, implying the possible importance of these constructs for the development of such psychopathology. With regard to personality functioning, this is in line with previous research demonstrating associations between personality functioning and PTSD and cPTSD that were also more pronounced for cPTSD than PTSD (60).

Following our initial line of thinking that the underlying pathway of the association between ACEs and PTSD as well as cPTSD might involve constructs such as personality functioning or epistemic trust, we included both variables in a SEM in order to explore the mediating and predictive characteristics of

TABLE 3 Correlations between the ETMCQ, ACE, OPD-SQS, ITQ-PTSD, and ITQ-cPTSD scales.

	ACE	ITQ-PTSD	ITQ-cPTSD
ETMCQ: trust	-0.10***	-0.03	-0.16***
ETMCQ: mistrust	0.19***	0.14***	0.32***
ETMCQ: credulity	0.25***	0.24***	0.39***
OPD-SQS: total score	0.41**	0.40**	0.66**
OPD-SQS: self-perception	0.37***	0.45***	0.67***
OPD-SQS: interpersonal contact	0.37***	0.34***	0.61***
OPD-SQS: relationship model	0.34***	0.29***	0.49***

** $p < 0.01$; *** $p < 0.001$. ETMCQ, Epistemic Trust, Mistrust and Credulity Questionnaire; OPD-SQS, Operationalized Psychodynamic Diagnosis Structure Questionnaire-Short Form; ACEs, Adverse Childhood Experiences Questionnaire; ITQ, International Trauma Questionnaire; PTSD, posttraumatic stress disorder; cPTSD, complex posttraumatic stress disorder.

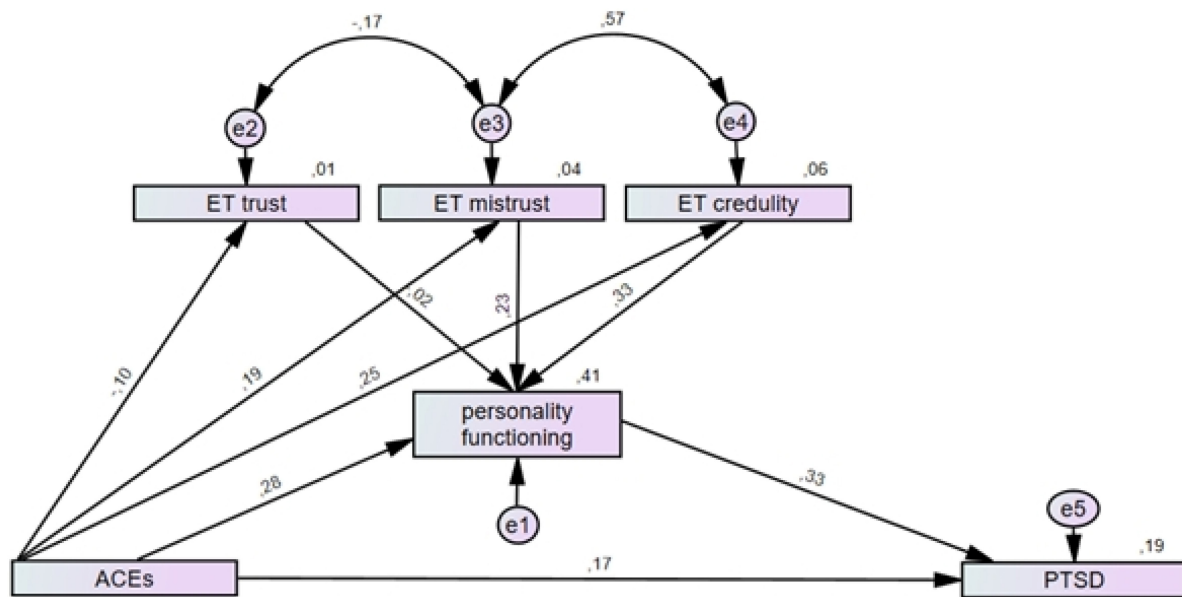


FIGURE 2

Structural equation models for the mediation effect of personality functioning and epistemic trust on the relationship of ACEs with PTSD symptoms. Personality functioning was added as a mediator for the association between ACEs and PTSD and the three epistemic trust subscales as predictors of personality functioning. Rectangles represent variables (ACEs, Adverse Childhood Experiences measured by the ACE; personality functioning measured by the OPD-SQS; ET, epistemic trust measured by the ETMCQ; PTSD, posttraumatic stress disorder symptoms measured by the ITQ) and circles represent error terms (e). Numbers next to arrows in the model represent standardized estimates, numbers next to factors represent the R², i.e. the explained variance.

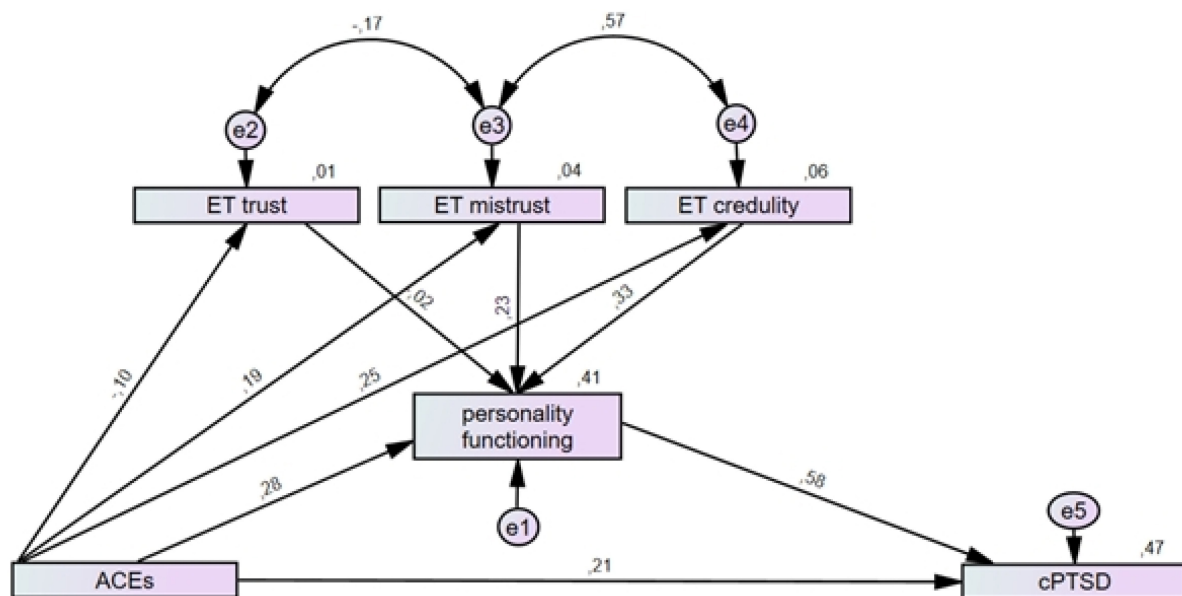


FIGURE 3

Structural equation models for the mediation effect of personality functioning and epistemic trust on the relationship of ACEs with cPTSD symptoms. Personality functioning was added as mediator for the association between ACEs and cPTSD and the three epistemic trust subscales as predictors of personality functioning. Rectangles represent variables (ACEs, Adverse Childhood Experiences measured by the ACE; personality functioning measured by the OPD-SQS; ET, epistemic trust measured by the ETMCQ; cPTSD, complex posttraumatic stress disorder symptoms measured by the ITQ) and circles represent error terms (e). Numbers next to arrows in the model represent standardized estimates, numbers next to factors represent the R², i.e. the explained variance.

these constructs. For PTSD, the explained variance increased notably from 8 to 19% when including personality functioning as a mediator in the direct association between ACEs and PTSD. For cPTSD, the relationship was even stronger with the explained variance increasing from 20 to 47%. To our knowledge, this is the first study to investigate this association. Whilst previous research has focused on isolated and specific mechanisms such as affect regulation (28) or attachment (61), we assessed different but intertwined psychological functions comprising self-regulation, self-perception, and interpersonal difficulties in the form of personality functioning. Scarce research already including personality functioning focused on different psychopathologies in adulthood. For example, a similar pathway was found for depression and anxiety where personality functioning (partially) mediated the association between child maltreatment and depression and anxiety symptoms, respectively (12, 25). Personality functioning appears to be a relevant underlying mechanism in adults with different psychopathologies including PTSD and especially cPTSD and a history of ACEs.

We also included epistemic trust in our SEM to empirically test the predictive value of this construct. In line with our third hypothesis, our results show that, compared to ACEs as a single predictor, the inclusion of epistemic trust substantially increased the explained variance of personality functioning from 16 to 41%. These results suggest that epistemic trust or rather disruptions of epistemic trust have an important influence on personality functioning, and thus, might play a role in better understanding the implications of ACEs in those with PTSD and cPTSD. There is the possibility that the disruption of the system of trusting socially conveyed information might lead to problems of personality functioning because updating knowledge about the self becomes a challenge. In other words, the risk of PTSD and cPTSD increases because the person is less connected to their social network so that adequate personality functioning—which assumes a free-flow of information within a social network—becomes compromised. Yet, notably stronger associations for cPTSD compared to PTSD have to be considered with respect to the different diagnostic requirements: while cPTSD is normally associated with prolonged or multiple ACEs, PTSD can be caused by a variety of single stressful or threatening events. That ACEs might cause disruptions in epistemic trust and therefore impairments in personality functioning—an assumption that requires further research—might in part explain the specific symptoms accompanying cPTSD, namely impaired affect regulation, low self-esteem, and interpersonal problems (18, 19, 62).

Even though future research has to validate our findings, we believe knowledge about constructs such as personality functioning and specifically epistemic trust—both modifiable by psychotherapy (47, 62–64)—should inspire further research on psychotherapeutic prevention and intervention when addressing PTSD and more importantly cPTSD but also when

considering adult psychopathology in general and personality disorders in particular.

Strengths and limitations

A major strength of this study was the availability of representative data from a face-to-face survey which included information about participants' psychological, physical, personal and socio-demographic characteristics. In addition, to our knowledge this is the first study to empirically examine the role of epistemic trust in the direct context of ACEs and PTSD as well as cPTSD in adulthood. While standardized clinical diagnoses are certainly the gold standard, we consider it a strength of the study that the layout of the ITQ allows for potential classification of diagnosis by assessing the specific diagnostic criteria of PTSD and cPTSD according to ICD-11 (52). Nevertheless, the ITQ is a self-report measure that does not resemble the quality of a clinical diagnosis. Moreover, there are potential limitations that should be considered with regard to the study results. While overall quality of the data is high (unbiased general population based data), the cross-sectional study design limits the interpretation of the results in terms of causality. From a developmental perspective, ACEs could have also immediately resulted in disrupted trust and attachments, and therefore, PTSD or cPTSD in childhood, which in turn could have impaired a healthy personality development during late childhood and adolescence. While we examined epistemic trust in relation to personality functioning, we did not include attachment which might offer even further insights on the involved pathways of ACEs and adult psychopathology (43). In addition, we did not conduct separate analyses for different subtypes of ACEs that might yield further insights on the role of a specific type of ACEs—e.g., sexual abuse—in relation to adult psychopathology.

Conclusion

Our results add to the body of evidence demonstrating the mediating effect of personality functioning in the association of ACEs and adult psychopathology. Our findings imply that personality functioning might play an important role in developing PTSD and even more importantly cPTSD symptoms in adulthood following ACEs. Theory driven and based on preliminary research in the area of personality research, we included epistemic trust as a new and potentially relevant element for this association, showing that epistemic trust had indeed a predictive influence on a persons' level of personality functioning. This knowledge helps us to better understand the underlying pathways resulting in psychopathology following ACEs but also might inform psychotherapeutic treatment

planning by considering and addressing the interfering role of e.g., epistemic mistrust within the therapeutic relationship.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving human participants were reviewed and approved by the Ethics Committee of the Medical Faculty of the University of Leipzig (474/20-ek). Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

Author contributions

HK, DR, JK, AL, and TN participated in the research design. PF offered the conceptual framework of the epistemic trust construct. EB collected the data. DR conducted the formal statistical analyses. JK and AL supervised the study. HK and DR wrote the original draft of the manuscript. NH, LK, TN, and SZ

contributed to the writing of the manuscript. NH, EB, CS, JK, AL, SG, PF, TN, LK, and SZ reviewed and edited the manuscript. All authors approved the final version of the manuscript.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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4.7. PUBLIKATION VII

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Mentalizing and epistemic trust as critical success factors in psychosomatic rehabilitation: results of a single center longitudinal observational study

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Background: Inpatient psychosomatic rehabilitation is a key treatment for patients with mental health issues. However, knowledge about critical success factors for beneficial treatment outcomes is scarce. The aim of this study was to evaluate the association of mentalizing and epistemic trust with the improvement of psychological distress during rehabilitation.

Methods: In this naturalistic longitudinal observational study, patients completed routine assessments of psychological distress (BSI), health-related quality of life (HRQOL; WHODAS), mentalizing (MZQ), and epistemic trust (ETMCQ) before (T1) and after (T2) psychosomatic rehabilitation. Repeated measures ANOVA (rANOVAs) and structural equation models (SEMs) were calculated to investigate the association of mentalizing and epistemic trust with the improvement in psychological distress.

Results: A total sample of $n=249$ patients were included in the study. Improvement in mentalizing was correlated with improvement in depression ($r=0.36$), anxiety ($r=0.46$), and somatization ($r=0.23$), as well as improved cognition ($r=0.36$), social functioning ($r=0.33$), and social participation ($r=0.48$; all $p<0.001$). Mentalizing partially mediated changes in psychological distress between T1 and T2: the direct association decreased from $\beta=0.69$ to $\beta=0.57$ and the explained variance increased from 47 to 61%. Decreases in epistemic mistrust ($\beta=0.42$, 0.18–0.28; $p<0.001$) and epistemic credulity ($\beta=0.19$, 0.29–0.38; $p<0.001$) and increases in epistemic trust ($\beta=0.42$, 0.18–0.28; $p<0.001$) significantly predicted improved mentalizing. A good model fit was found ($\chi^2=3.248$, $p=0.66$; CFI=0.99; TLI=0.99; RMSEA=0.000).

Conclusion: Mentalizing was identified as a critical success factor in psychosomatic inpatient rehabilitation. A key component to increase mentalizing in this treatment context is the improvement of epistemic mistrust.

KEYWORDS

mentalization, mental disorders, MZQ, psychosomatic, rehabilitation, epistemic trust, attachment, mentalizing

1. Introduction

In psychosomatic medicine, it is assumed that physical illnesses can have a multi-factorial etiology in which biological, psychological, and social factors interact to cause and maintain physical and mental symptoms and complaints (1). Physical and/or psychological stress, inflammation, and degeneration are etiological factors commonly implicated in psychosomatic disorders and the resulting symptoms can manifest in various organ systems, including the nervous system, the musculoskeletal system, the cardiovascular system, the respiratory system, the gastrointestinal system, and the skin (2). These interactions between psychosocial stressors and alterations in the nervous, endocrine and immune systems are referred to as the “allostatic load” (3, 4). Thus, psychosomatic therapies and rehabilitation are typically delivered in multidisciplinary settings by a team of professionals from various disciplines (physicians, psychologists, dietitians, physiotherapists, and occupational therapists) (5). Psychosomatic rehabilitation aims to reduce symptoms and restore the level of functioning, to increase coping with and participation in daily life (e.g., ability to work or participate in social life), and to improve quality of life and well-being (6). Inpatient psychosomatic rehabilitation has been found to effectively improve the patients physical and mental health as well as their social functioning and working ability and motivation [e.g., (7–10)]. While a wide range of barriers and facilitators of rehabilitation success have been identified (11), so far no conclusive set of critical success factors, i.e., transpersonal and transdiagnostic predictors of rehabilitation outcome, could be identified.

In psychotherapy research, the transdiagnostic concept of mentalization has increasingly gained recognition over the last decades. It was initially conceptualized by Fonagy and Bateman to gain a better understanding—and thereby to improve treatment—for patients with borderline personality disorder (BPD) (12). The authors defined mentalizing as a mental process that facilitates the understanding and representation of inner mental states in oneself and others by taking into account one’s own thoughts, needs, emotions, wishes, and desires as well as those of others (13, 14). It is assumed that the development of mental representations of internal states is facilitated by emotional mirroring processes during infancy, which builds the basis for the infants’ emerging capacity to regulate their own affect. In case of disruptions in attachment experiences, children may develop deficits in mentalizing, which include a lack of emotional awareness and self-reflection and the equation of inner mental states with outer reality (15). Thus, mentalizing is closely linked to emotion regulation (16), and its development is facilitated by secure attachments and relationships (17).

The specifically developed treatment approach—mentalization based treatment (MBT) (18)—was found to substantially improve mental health, global functioning, and vocational status of patients with BPD with long term effectiveness (19, 20). In recent years, the concept of mentalization was adapted for a broad range of other disorders, including depression (21–23), posttraumatic stress disorder (24), dissociation (25), and eating disorders (17, 26, 27).

One key concept associated with secure attachment and therefore mentalizing is the development of epistemic trust, which means the ability to evaluate whether information from other persons or sources is trustworthy, relevant to the self, and generalizable to other contexts (28). Individuals with higher levels of epistemic trust are selectively and appropriately open to opportunities for social learning in benign social circumstances (29). Contrarily, individuals who are exposed to adversities in childhood and have not developed a secure attachment system may display higher levels of epistemic disruption: Epistemic mistrust describes a tendency to mistrust any source of information as unreliable or ill-intended and with the individual therefore avoiding being influenced by others (i.e., resistance to social learning). Epistemic credulity on the other hand describes a pronounced lack of vigilance and appropriate discrimination between trustworthy and untrustworthy information, leading to an increased vulnerability to be misinformed and exploited (29). Fonagy et al. (30) have suggested that epistemic trust facilitates the acquisition and accommodation of new information and thus helps to develop social functioning and resilience when facing challenging information. Epistemic mistrust and credulity have been identified as significant predictors for personality functioning in the German general population in a previous study (31). The concept of epistemic trust, mistrust, and credulity may therefore be highly relevant to psychotherapeutic treatments, since it underpins the individual’s ability to develop a trustful relationship to their therapist and the resulting openness toward transfer of knowledge in the broader sense including to learn differing views and perspectives and, thus, to improve the ability for mentalizing.

In previous studies, improved mentalizing was identified as a potential critical success factor for psychosomatic rehabilitation (32) and as an effective element in psychotherapy (33–35). Nevertheless, evidence on the role of epistemic trust and mentalizing as mediators in psychotherapeutic treatments and especially in psychosomatic rehabilitation is still scarce.

The aim of the study was to assess the association of mentalizing and epistemic trust with the improvement of overall psychological distress during psychosomatic inpatient rehabilitation. Based on our previous studies, we hypothesized that (a) improvement in mentalizing would mediate improvement of psychological symptoms during rehabilitation (25, 32) and that (b) levels of epistemic trust would be positively associated with improvement in mentalizing while for epistemic disruption (mistrust and credulity) a negative impact would be observed (31).

2. Methods

2.1. Sample and setting

Data were collected as part of the clinical routine procedures at the Psychosomatic Rehabilitation Center Montafon (Schruns, Austria). Adult patients underwent multidisciplinary and multimodal

inpatient rehabilitation, with costs being covered by the Austrian social security institution. Data were collected in a systematic standardized survey procedure at the beginning (T1; within the first week) and end (T2; within the last week) of the rehabilitation treatment. At the time of the admission, patients were asked whether they were willing to participate in an observational study. Upon written informed consent, they were included. Data were collected electronically using a multifunctional web-based application called the Life App, which is based on the Computer-Based Health Evaluation Software (CHES) (36). Data were included in the analysis if patients provided complete assessments at both time points. The study had been submitted to the Ethics Commission of the University of Innsbruck (no. 108/2022) and was conducted according to the principles of the Declaration of Helsinki.

2.2. Psychosomatic inpatient rehabilitation treatment

Rehabilitation lasted 6 weeks with 9 h of therapeutic units per week. Patients received multidisciplinary and multimodal therapies, which typically included two 90-min sessions of symptom-specific group therapy (e.g., for trauma, burn-out, somatization, pain, etc.), 1 h of individual psychotherapy, and 2 h of group sessions for relaxation training. Additionally, each patient participated in one group session to develop medium-term goals and therapy focus for the next week, as well as two hourly group sessions for resource activation. The guidelines of the Austrian social security institutions, which require certain frequencies for the respective therapies, served a basis for the treatment planning.

2.3. Measures

2.3.1. Brief symptom inventory

Psychological distress was assessed with the Brief Symptom Inventory (BSI-18), consisting of 18 items rated on a four-point Likert scale (from “not at all” to “very often”). A total score and three subscale scores (depression, anxiety, and somatization) can be calculated. Good reliability and validity for the subscales and total score have been reported. In our sample, excellent internal consistency was found for the BSI total score ($\alpha = 0.92$).

2.3.2. Mentalization questionnaire

The original version of the mentalization questionnaire (MZQ) was developed as a self-rated instrument to assess mentalizing from a patient's perspective (37). It consists of 15 items with responses ranging from “no agreement at all” to “total agreement” on a five-point Likert scale. Analyses based on data from 434 German inpatients with mental disorders at three time points yielded four subscales with acceptable reliability and sufficient validity. Higher scores on the MZQ sum scale indicate lower mentalizing capacities. In a recent validation of the MZQ in the German general population, good reliability and validity was reported for the MZQ total score (38). In our sample, a good internal consistency was also found for the total score ($\alpha = 0.89$).

2.3.3. Epistemic trust

The Epistemic Trust, Mistrust and Credulity Questionnaire (ETMCQ) is used to assess a person's capability of epistemic trust. It

consists of 15 items measuring the three subscales “epistemic trust,” “mistrust,” and “credulity” on a seven-point Likert scale. Response options for each item range from one “strongly disagree” to seven “strongly agree,” resulting in a sum score between 15 and 105. High trust reflects a person's ability to be open to opportunities for social learning, while high mistrust indicates a tendency to treat information sources as unreliable and to rather avoid being influenced by communication from others. High credulity reflects a person's lack of clarity about their own position, which can lead to high vulnerability to misinformation and exploitation by others (29). In our sample, acceptable internal consistency was observed for the subscales trust ($\alpha = 0.71$) and credulity ($\alpha = 0.79$), while the mistrust subscale showed a lower value ($\alpha = 0.57$).

2.3.4. World health organization disability assessment scale

The World Health Organization Disability Assessment Scale (WHODAS 2.0) is a self-report questionnaire used to assess activity and participation limitations in conjunction with the ICF. It consists of six domains of health-related quality of life (HRQOL), namely mobility, cognition, self-care, social functioning, life activities, and participation in the society, which can be summed up to a total score. The WHODAS 2.0 is scored on a continuum from 0 to 100, where 0 indicates the absence of disability in all domains, while 100 indicates maximal disability. The WHODAS 2.0 has been identified as a valid and reliable self-report instrument for the assessment of disability (39).

2.4. Statistical analyses

Demographics for the sample are presented with means and standard deviations (SD). Associations of mentalization and epistemic trust with anxiety, depression, and somatization as well as HRQOL and working ability at baseline (T1) were investigated with Pearson correlation coefficients. Mean change of mentalization, epistemic trust, mistrust and credulity as well as psychological distress during rehabilitation was evaluated by calculation of repeated measures ANOVA (rANOVAs). To determine, whether different levels of mentalizing at baseline were associated with the improvement during rehabilitation, patients were assigned to three groups, based on the tertiles of the MZQ score within the patient group: low (i.e., >75% MZQ total score), moderate (25–75%), and high mentalization capacity (<25%). MZQ severity groups were added as between-subject factor. Effect size values $\eta^2 \geq 0.01$ were considered small, $\eta^2 \geq 0.06$ as medium, and $\eta^2 \geq 0.14$ as large (40). The MZQ total score for the total sample and patients with different levels of mentalization at baseline were compared to values from the German general population (38).

To investigate the association of mentalizing and epistemic trust with the improvement of psychological distress, a structural equation model (SEM) was calculated (see Figure 1). In model A, the direct association of the BSI total score at baseline (T1) with the BSI total score at T2 was tested. In model B, mean change in mentalizing as measured by the MZQ total score was added to the model as a mediator for this relationship, and changes in the epistemic trust subscales were added as predictors for mentalizing. Due to baseline differences, the calculation of change scores may lead to misleading effects (e.g., floor or ceiling effects) and thus may distort the interpretation of therapy effectiveness across groups with differences

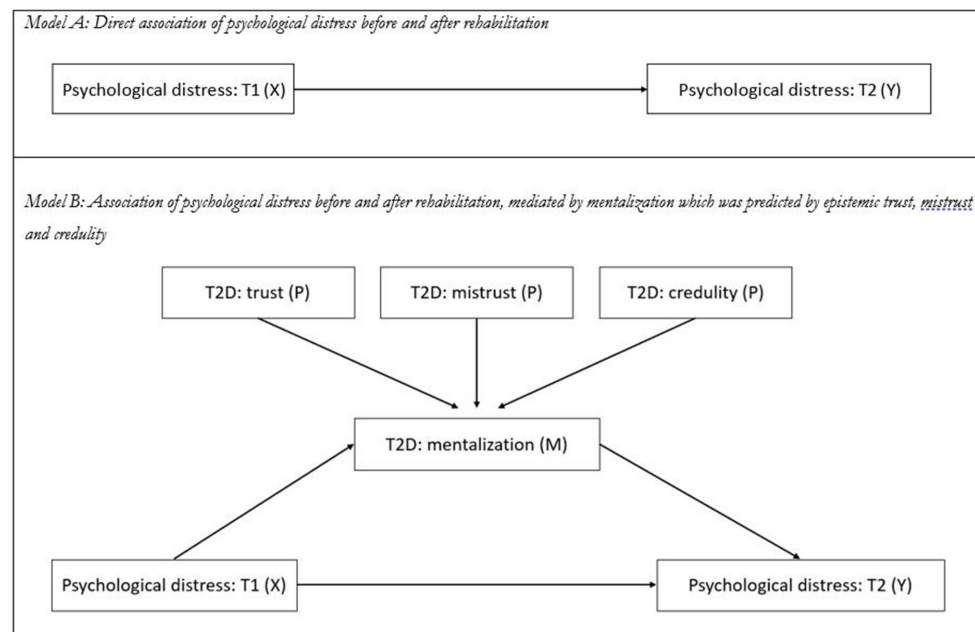


FIGURE 1

Structural equation models to test the mediation effect of mentalization and epistemic trust on the relationship of psychological distress before (T1) and after rehabilitation (T2). (A) Direct association of pre-rehab psychological distress as measured by the BSI-18 total score at T1 (X) with post-rehab psychological distress as measured by the BSI-18 total score at T2 (Y). (B) Association of pre-rehab psychological distress (X) on post-rehab psychological distress (Y), mediated by changes in mentalization as measured by the T2D of the MZQ total score (M), which is predicted by epistemic trust, mistrust, and credulity as measured by the T2D score of ETMCQ scales (P).

in baseline values. If, for example, a patient already reports good mentalizing scores before rehabilitation, no substantial increase (change) is expected during rehabilitation. In this case, although patient's mentalizing capacity may change substantially, only a slight or no increase can be measured by calculation of the mean difference. A simple solution might be the use of the "performance score (T2D)," based on the formula $T2 + (T2 - T1)$, which reflects the individual performance and considers the functional status at the beginning of rehabilitation (changes from T1 to T2; Δ) without problems of mathematical coupling or regression effects, as seen in ANCOVA (41–43). We therefore used the T2D mentalizing and epistemic trust scores in the models as moderator and predictor variables.

To account for potential non-normal distribution of data, bootstrapped confidence intervals [5,000 samples, 95% confidence interval (CI)] were calculated to evaluate the statistical significance of all included paths 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 was closely fitting the theoretical model, the value of p of Close Fit (PCLOSE) was calculated based on the RMSEA values, with values of $p > 0.05$ indicating close fit and $p < 0.05$ indicating worse than close model fit. Acceptable goodness of fit was defined as RMSEA values of < 0.08 and CFI/TLI values > 0.90 . The Bollen-Stine bootstrapping procedure was applied to evaluate the model fit under the assumption of non-normality, with values > 0.05 indicating a good fit (44, 45). Statistical analyses were performed with IBM SPSS (v22.0) and SPSS

AMOS (v24.0). p values < 0.05 (two-sided) were considered statistically significant.

3. Results

3.1. Sample characteristics

Of the initial $N = 402$ patients, $n = 25$ (6.2%) were excluded due to missing questionnaire data at T1 and another $n = 128$ (31.8%) due to missing data at T2. Of these, $n = 16$ (12.5%) did not complete the inpatient treatment (i.e., less than 3 weeks of treatment). Another $n = 112$ patients did not complete the assessment at T2 or data were not collected because of organizational problems during the first months after opening the rehabilitation center. The remaining $N = 249$ patients were included in the study. Patients with complete and missing data at T2 did not statistically differ in terms of age ($p = 0.65$), BSI total score ($p = 0.75$), MZQ total score ($p = 0.22$), epistemic trust ($p = 0.29$), mistrust ($p = 0.89$), or credulity ($p = 0.25$). Sociodemographic characteristics of the final sample are presented in Table 1. The majority of patients was female (63.7%), single (41.5%), between 40 and 60 years old (63.3%). Most frequent clinician rated ICD-10 main diagnosis was depressive disorder (52.0%).

As for the BSI subscales, 77.4% ($n = 192$) patients reported values above the cut-off for depression, 82.3% ($n = 204$) for anxiety, and 69.0% ($n = 171$) for somatization. Regarding baseline mentalizing levels, 26.2% ($n = 65$) showed low mentalizing capabilities with a mean MZQ score of 4.0, 52.4% ($n = 130$) a moderate level of mentalizing

TABLE 1 Sociodemographic data (N=249).

	N	%(SD)
Mean age (SD)	41.5	(11.9)
<40	67	27.0%
40–60	157	63.3%
>60	23	9.3%
Missing	1	0.4%
Sex		
Male	89	35.9%
Female	158	63.7%
Missing	1	0.4%
Relationship status		
Divorced	29	11.7%
Single	103	41.5%
Married	71	28.6%
Widowed	5	2.0%
Missing	40	16.1%
ICD-10 diagnosis		
Depressive disorder (F32–F34)	129	52.0%
Anxiety disorder (F41)	22	8.9%
PTSD/cPTSD (F43.1/F62.0)	27	10.9%
Adjustment disorder (F43.0, F43.2, F43.9)	32	12.9%
Somatization disorder (F44, F45, F54)	13	5.2%
Other disorder	25	10.1%

SD, standard deviation; PTSD, post-traumatic stress disorder; cPTSD, complex post-traumatic stress disorder.

with a mean score of 3.1 and another 21.4% ($n=53$) a high level of mentalizing with a mean score of 1.9.

Comparison of baseline mentalizing scores across ICD-10 diagnosis groups also revealed statistically significant group differences for mentalizing with medium effect sizes [$F(5, 242)=4.50$, $p=0.001$; $\eta^2=0.09$]. Bonferroni corrected *post hoc* analysis revealed that patients with a PTSD/cPTSD diagnosis reported significantly lower mentalizing scores than patients with adjustment disorders ($p=0.037$) or somatization disorder ($p=0.021$). See Figure 2 below.

3.2. The association of mentalizing and epistemic trust with psychological distress and health-related quality of life

Lower mentalizing (i.e., higher MZQ score) as well as higher epistemic mistrust and epistemic credulity were associated with higher levels of depression, anxiety, somatization, as well as lower health-related quality of life (HRQOL). For epistemic mistrust, highest positive correlations were found with anxiety, while for epistemic credulity, highest correlations were found with depression. Higher epistemic trust, in turn, was associated with lower levels of depression, anxiety, somatization as well as most HRQOL subscales. Here, the highest negative correlations were found with impaired social functioning (“getting along”; Table 2).

Patients with lower levels of mentalizing at T1 were consistently more likely to report values above the clinical cut-off for depression ($\chi^2=42.38$, $p<0.001$), anxiety ($\chi^2=30.59$, $p<0.001$), somatization ($\chi^2=10.21$, $p=0.006$), and general psychological distress ($\chi^2=42.55$, $p<0.001$). For details see Figure 3.

Lower age was associated with worse mentalizing at baseline ($r=-0.13$, $p=0.042$), while no significant differences were found in regard to sex ($t=1.50$, $p=0.14$) or relationship status [$F(3,207)=0.38$, $p=0.77$]. Additionally, higher age was significantly associated with

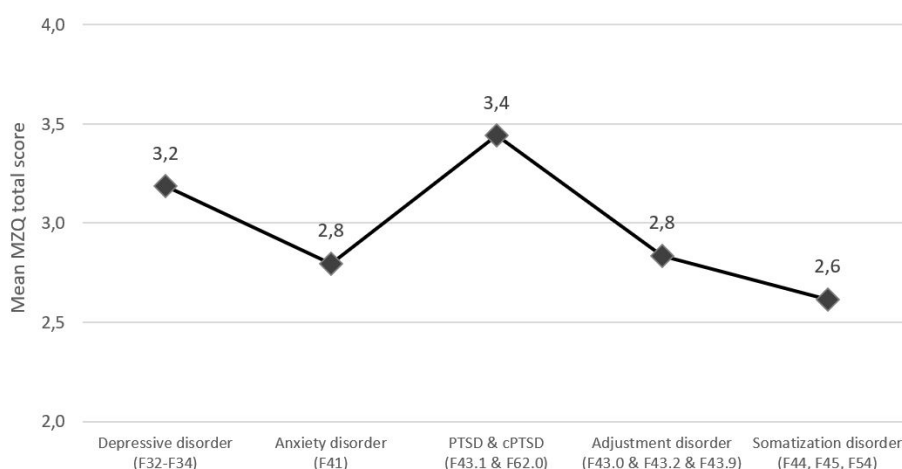


FIGURE 2

Mean Mentalization Questionnaire (MZQ) total score, stratified by baseline ICD-10 diagnoses. Mean MZQ scores range from 1 to 5 points with higher score indicating worse mentalizing capacities.

higher epistemic trust ($r=0.13$, $p=0.048$) and lower credulity ($r=-0.15$, $p=0.021$), while no significant association was observed with epistemic mistrust ($p=0.10$). Women reported higher levels of

TABLE 2 Correlations of baseline (T1) MZQ & ETMCQ scores with BSI-18 and WHODAS scores.

	N	MZQ total score	ETMCQ trust	ETMCQ mistrust	ETMCQ credulity
BSI-18					
Depression	249	0.60***	-0.20**	0.41***	0.33***
Anxiety	249	0.58***	-0.18**	0.47***	0.32***
Somatization	249	0.40***	-0.14*	0.32***	0.21***
Total score	249	0.62***	-0.20**	0.47***	0.34***
WHODAS					
Cognition	249	0.54***	-0.21**	0.41***	0.24***
Mobility	249	0.32***	-0.24***	0.31***	0.16*
Self-care	249	0.32***	-0.07	0.28***	0.24***
Getting along	249	0.59***	-0.33***	0.43***	0.22***
Household activities	249	0.33***	-0.10	0.18**	0.09
School / work activities	249	0.20**	-0.15*	0.15*	0.04
Participation	249	0.55***	-0.21**	0.38***	0.25***
Total score	249	0.55***	-0.25***	0.42***	0.24***

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$; MZQ, mentalization questionnaire; ETMCQ, epistemic trust, mistrust and credulity questionnaire; BSI-18, brief symptom inventory (Mini SCL); WHODAS, WHO disability assessment schedule; higher MZQ scores indicate worse mentalizing capacities; higher ETMCQ scores indicate higher epistemic trust, mistrust or credulity; higher BSI-18 scores indicate higher symptom load; and higher WHODAS scores indicate higher functional disability.

epistemic trust than men did (4.9 ± 1.1 vs. 4.5 ± 0.9 points; $t=2.76$, $p=0.006$), while no sex differences were observed for epistemic mistrust ($p=0.23$) and epistemic credulity ($p=0.49$). No association of the relationship status and epistemic trust, mistrust, and credulity were observed ($p=0.20-0.99$).

Improvement in mentalizing was significantly correlated with improvement in depression ($r=0.36$, $p<0.001$), anxiety ($r=0.46$, $p<0.001$), and somatization ($r=0.23$, $p<0.001$), as well as improved cognition ($r=0.36$, $p<0.001$), mobility ($r=0.22$, $p=0.001$), self-care ($r=0.15$, $p=0.020$), social functioning ($r=0.33$, $p<0.001$), household activities ($r=0.16$, $p=0.016$), school or work activities ($r=0.22$, $p=0.002$), and social participation ($r=0.48$, $p<0.001$).

3.3. Changes of mentalizing, epistemic trust, psychological distress, and HRQOL during rehabilitation

Overall, patients reported a statistically significant improvement of mentalizing with medium effect sizes [$F(1, 245) = 21.54$, $p<0.001$, $\eta^2=0.08$]. We also observed a statistically significant group*time effect regarding the different levels (=groups) of mentalizing with large effect sizes [$F(1, 245) = 24.11$, $p<0.001$, $\eta^2=0.16$]: patients with lowest levels of mentalizing showed largest improvements compared to patients with higher levels of mentalizing at baseline. When compared to the German general population (38), patients with low and medium mentalizing capacities showed substantially worse mentalizing impairment both at baseline and after therapy. Patients with high mentalizing capacity on the other hand reported a comparable MZQ total score before and after treatment ($1.9/2.1$ vs. 2.3 points). For details see Table 3 and Figure 4.

During rehabilitation, patients reported statistically significant improvements with large effect sizes regarding depression, anxiety, somatization, and HRQOL, while epistemic trust and credulity improved with low-to-medium effect sizes. For epistemic mistrust, however, no

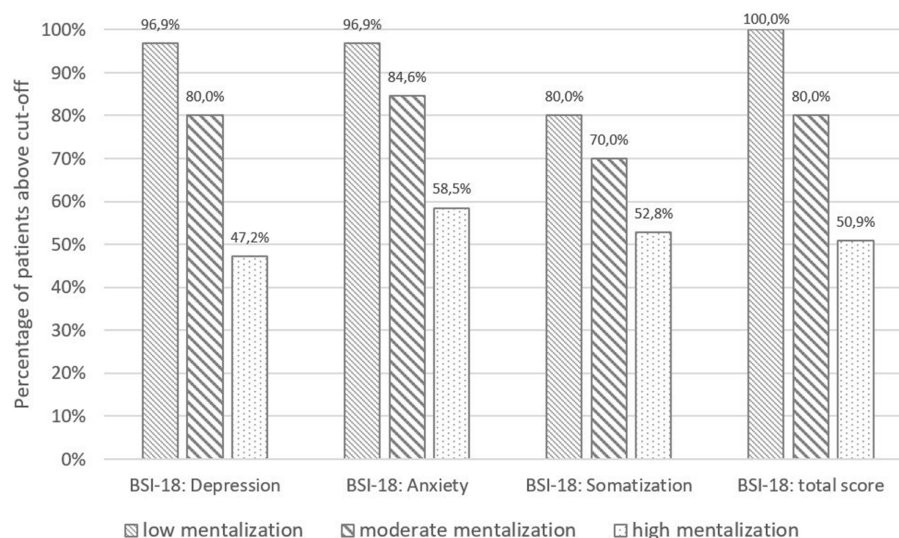


FIGURE 3
Percentage of patients above BSI-18 cut-offs, stratified for level of mentalizing.

TABLE 3 Mean MZQ, BSI, WHODAS, and ETCQ scores before and after rehabilitation, stratified for baseline level of mentalizing.

	Mentalizing capacity	<i>n</i>	Pre rehab (T1)		Post rehab (T2)		Delta	Rehab		Rehab*group	
			Mean	(SD)	Mean	(SD)		<i>p</i>	η^2	<i>p</i>	η^2
MZQ total score	Total	248	3.1	(0.79)	2.9	(0.79)	0.2	<0.001	0.081	<0.001	0.164
	High	53	1.9	(0.38)	2.1	(0.53)	−0.2				
	Moderate	130	3.1	(0.30)	2.9	(0.64)	0.2				
	Low	65	4.0	(0.30)	3.4	(0.77)	0.6				
BSI-18 depression	Total	248	10.1	(5.99)	5.9	(5.23)	4.2	<0.001	0.404	<0.001	0.076
	High	53	4.9	(4.30)	2.8	(3.17)	2.1				
	Moderate	130	10.1	(5.48)	5.9	(5.07)	4.2				
	Low	65	14.5	(4.58)	8.5	(5.57)	6.0				
BSI-18 anxiety	Total	248	9.2	(5.48)	5.7	(5.01)	3.5	<0.001	0.346	<0.001	0.064
	High	53	5.0	(3.41)	2.9	(3.03)	2.1				
	Moderate	130	9.0	(5.11)	5.8	(5.10)	3.2				
	Low	65	13.2	(4.82)	7.8	(5.09)	5.4				
BSI-18 somatization	Total	248	6.7	(4.89)	4.6	(4.32)	2.1	<0.001	0.214	0.045	0.025
	High	53	4.0	(3.08)	2.7	(2.45)	1.3				
	Moderate	130	6.5	(4.53)	4.5	(4.16)	2.0				
	Low	65	9.3	(5.49)	6.3	(5.15)	3.0				
BSI-18 total	Total	248	26.0	(14.08)	16.2	(13.10)	9.8	<0.001	0.433	<0.001	0.081
	High	53	13.9	(8.38)	8.4	(7.09)	5.5				
	Moderate	130	25.6	(12.72)	16.2	(12.73)	9.4				
	Low	65	36.9	(11.81)	22.6	(14.26)	14.3				
WHODAS	Total	248	41.6	(17.60)	28.2	(19.02)	13.4	<0.001	0.369	0.37	0.010
	High	53	28.1	(14.31)	18.2	(16.27)	9.9				
	Moderate	130	41.5	(15.58)	27.2	(16.94)	14.3				
	Low	65	53.3	(15.74)	38.0	(20.11)	15.3				
ETMCQ: trust	Total	248	4.7	(1.08)	4.9	(1.00)	0.2	0.002	0.040	0.07	0.02
	High	53	5.1	(0.98)	5.2	(0.87)	0.1				
	Moderate	130	4.8	(0.94)	4.9	(0.92)	0.1				
	Low	65	4.3	(1.29)	4.7	(1.21)	0.4				
ETMCQ: mistrust	Total	248	4.1	(0.98)	4.0	(1.06)	0.1	0.06	0.015	0.13	0.017
	High	53	3.3	(0.87)	3.2	(0.88)	0.1				
	Moderate	130	4.0	(0.79)	4.0	(0.90)	0.0				
	Low	65	4.9	(0.83)	4.7	(1.02)	0.2				
ETMCQ: credulity	Total	248	3.4	(1.39)	3.5	(1.34)	0.1	0.012	0.025	0.90	0.001
	High	53	2.7	(1.29)	2.8	(1.06)	0.1				
	Moderate	130	3.4	(1.27)	3.5	(1.31)	0.1				
	Low	65	4.1	(1.40)	4.2	(1.32)	0.1				

MZQ, mentalization questionnaire; BSI-18, brief symptom inventory (18 item version); WHODAS, world health organization disability assessment scale; ETMCQ, epistemic trust, mistrust, and credulity questionnaire; SD, standard deviation; Effect sizes η^2 : 0.01 = small, 0.06 = medium, 0.14 = large; higher MZQ scores indicate worse mentalizing capacities; higher ETMCQ scores indicate higher epistemic trust, mistrust or credulity; higher BSI-18 scores indicate higher symptom load; and higher WHODAS scores indicate higher functional disability.

significant changes could be observed during rehabilitation. Baseline mentalizing levels were significantly associated with improvements pre to post rehabilitation with medium effect sizes for depression, anxiety and

HRQOL and a small effect size for somatization (group*time effect). Baseline mentalizing level was neither associated with epistemic trust, nor with mistrust or credulity. For details, see [Table 3](#).

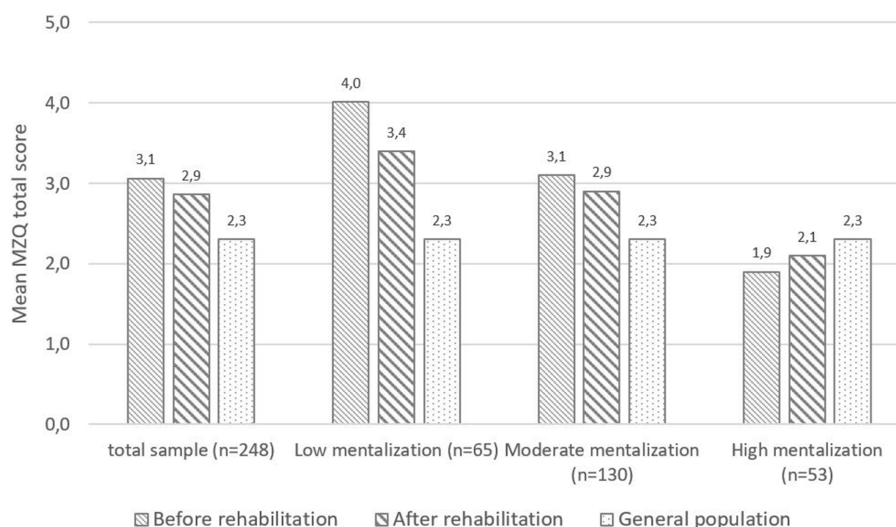


FIGURE 4

MZQ-total score before (T1) and after (T2) rehabilitation, stratified by baseline level of mentalizing. For comparison norm values from the German general population for the MZQ total score (38) are displayed. Mean MZQ scores range from 1 to 5 points with higher score indicating worse mentalizing capabilities.

3.4. Mentalizing and epistemic trust as mediators of improvement of psychological distress during rehabilitation treatment

In the first step, the direct associations of psychological distress at baseline (T1) and at the end of rehabilitation (T2) were investigated by calculation of a SEM. Psychological distress at baseline (T1) significantly predicted psychological distress at the end of rehabilitation (T2; $\beta=0.69$, 95%CI 0.61–0.75; $p=0.001$) and explained 47% of the variance. Since the number of distinct sample moments was equal to the number of distinct parameters to be estimated (i.e., resulting in zero degrees of freedom), no model fit indices could be calculated.

In the second step, the MZQ total score (T2D) was added as a mediator of the relationship between psychological distress at baseline (T1) and at the end of rehabilitation (T2), and the ETMCQ subscales (T2D) were added as predictors for mentalizing. The overall explained variance for psychological distress at the end of rehabilitation (T2) substantially increased to 61% and the direct association between pre- and post-rehabilitation was weakened ($\beta=0.57$, 95%CI 0.48–0.64; $p=0.001$). Decreases in epistemic mistrust ($\beta=0.42$, 0.18–0.28; $p<0.001$) and epistemic credulity ($\beta=0.19$, 0.29–0.38; $p<0.001$) and increases in epistemic trust ($\beta=0.42$, 0.18–0.28; $p<0.001$) significantly predicted improved mentalizing and explained 37% of its variance (compared to 9% explained by psychological distress at baseline only). A good model fit was found for the model ($\chi^2=3.248$, $p=0.66$; CFI=0.99; TLI=0.99; RMSEA=0.000, 95%-CI: 0.000–0.070; PCLOSE=0.87). For details, see Figure 5.

4. Discussion

Psychosomatic inpatient rehabilitation is a key treatment for patients with mental health issues in a number of western European

context of health care provision. However, so far only limited knowledge regarding the mechanisms for therapeutic success (i.e., “critical success factors”) is available. The aim of this study was to investigate the role of the patients’ mentalizing capabilities in association with the level of epistemic trust, mistrust, and credulity as potential transdiagnostic critical success factors for psychosomatic rehabilitation.

In our sample, patients reported a significant improvement of mentalizing and psychological distress during inpatient rehabilitation, which was in line with previous research (32). Not surprisingly, patients with lowest mentalizing at baseline also showed the largest improvements of mentalizing as well as the largest decrease in depression, anxiety, and somatization during rehabilitation. However, patients with high mentalization capabilities reported comparable scores to individuals from the German general population (38). Both pre- and post-treatment, MZQ scores were almost identical with the recently published study by Peters et al. (32), who also reported a significant improvement of mentalizing with moderate effect size during inpatient rehabilitation. In line with their results, in our sample the improvement of mentalizing was significantly associated with decreased depression, anxiety and somatization as well as improved quality of life, specifically in terms of social functioning and social participation – an indication of restored social learning from and engagement with a helpful social environment that deserves further replication and further mechanistic understanding.

In the structural equation model (SEM) in our study, increased mentalizing partially mediated the relationship of psychological distress before and after rehabilitation treatment. In line with our hypothesis, we identified mentalizing as a potential critical success factor in psychosomatic rehabilitation. Since we found a substantial variation in mentalizing at baseline, the performance score (T2D) was used in the SEM model. The T2D is a simple method to correct for baseline differences (46), which allows to use baseline corrected variables in SEM models and has been shown to facilitate interpretability in various fields of rehabilitation research (42, 43, 47, 48).

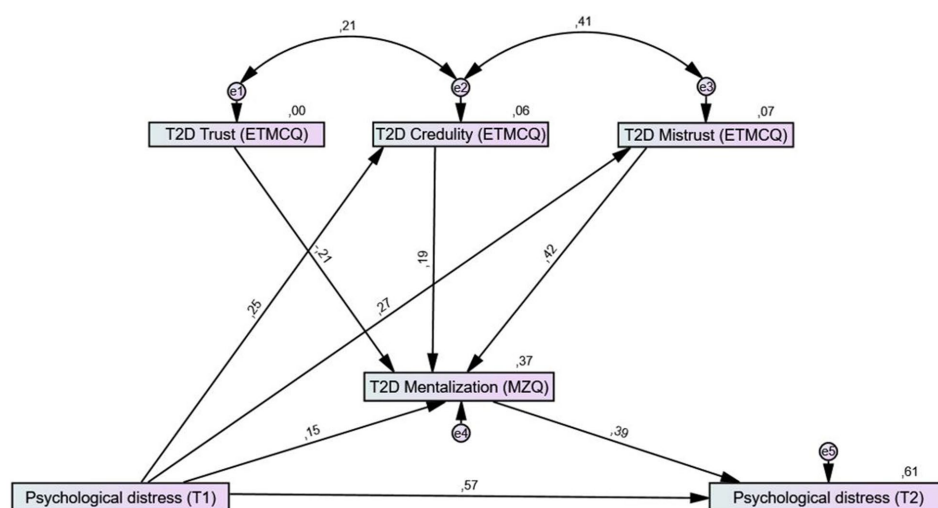


FIGURE 5

Structural equation models for the mediation effect of mentalizing and epistemic trust on the relationship of psychological distress before (T1) and at the end of rehabilitation (T2). Mentalizing was added as a mediator for the association between psychological distress (BSI total score) before and after rehabilitation and the three epistemic trust subscales as predictors of mentalizing. T2D=performance score $T2+(T2-T1)$. Rectangles represent variables (psychological distress measured by the BSI total score; mentalizing measured by the MZQ total score; ET, epistemic trust measured by the ETMCQ) 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. Higher MZQ scores indicate worse mentalizing capacities; higher ETMCQ scores indicate higher epistemic trust, mistrust, or credulity; higher BSI-18 scores indicate higher symptom load.

Moreover, we investigated additional factors that may be associated with the improvement of mentalizing in psychosomatic rehabilitation. One key concept related to the capability for mentalizing is epistemic trust. Epistemic trust is developed based on attachment experiences during childhood and describes the ability to evaluate if information from other persons or sources is trustworthy, relevant to the self, and generalizable to other contexts (28). In our study, the inclusion of epistemic trust, mistrust and credulity substantially increased the explained variance of mentalizing from 9 to 37%. The strongest predictor for improved mentalizing was decreased epistemic mistrust, which describes a tendency to mistrust any source of information as unreliable or ill-intentioned and therefore to avoid being influenced by others (i.e., resistance to social learning). It has been highlighted before, that a key factor in successful psychotherapy may be to break the vicious cycle of epistemic mistrust and to generate epistemic trust and thus to engender social learning within and beyond the therapeutic relationship (49). As rehabilitation is often tied to a socio-medical evaluation of patients' working ability and role functioning, it might be especially difficult to establish trustful relationship in this setting. However, it can be assumed that most patients in psychosomatic rehabilitation have various positive social interactions with healthcare professionals and other patients, while simultaneously experiencing improvements in both physical and mental health. The experience of trustworthy interactions might aid to reduce epistemic mistrust and strengthen epistemic trust. This may help patients to become more accessible to therapeutic encounters that address mentalization, e.g., exploration of emotional and physical self-awareness in psychotherapy, physical therapy or relaxation interventions. Indeed, our results demonstrate that inpatient psychosomatic rehabilitation facilitates reductions of epistemic mistrust while also increasing the capability of mentalizing, which is directly associated with lesser symptom burden in terms of reduced

depression, anxiety, and somatization as well as significantly improved HRQOL. These findings might inspire future research regarding underlying mechanisms of psychopathology as well as new treatment angles for psychotherapeutic interventions.

In our study, lower mentalizing was associated with higher psychological distress and lower HRQOL. Specifically, depression and complex PTSD symptoms were associated with ineffective mentalizing, which is in line with previous studies (22, 25). In line with the thinking of John Bowlby (50), three main types of adverse childhood experiences may increase the vulnerability for depressive reactions when faced with current threats to their attachment relationship: First, when children, despite great efforts, cannot establish a stable and secure relationship with their parents, they may tend to attribute failure and perceives losses or disappointments to their own fault. Second, when children are repeatedly made felt incompetent or unlovable, they will ultimately develop a corresponding model of themselves as incompetent and unlovable. Third, when an attachment figure dies, and children are confronted with the impossibility of grief and reparation this may lead to unresolved trauma (22, 51).

In adult life, impending ruptures in attachment relationships may be perceived either through separation, rejection, loss or a combination of these factors. In line with Lyten et al. (52), perceived ruptures in attachment relationships pose a threat to the self, leading to disturbed and/or distorted mentalizing in relation to one's own and others' motivations and desires. Furthermore, depressed mood is thought to lead to increased arousal (hyperarousal) and stress, which in turn impairs mentalizing (53). This may lead to a loss of resilience in the face of stress and ultimately to a vicious cycle of increasingly depressed mood (22). As for cPTSD, it is hypothesized that capability of mentalizing is temporarily suspended when defensive responses (fight-flight-freeze) are activated, to facilitate rapid responses to

imminent danger. Thus, adverse childhood experiences pose a double burden, since they affect the development of both emotion regulation and mentalizing. Later in life, the hyperactivation of the triggered attachment system combined with impaired mentalizing can lead to dysfunctional modes of thinking, such as the psychological equivalence, pretend mode, and teleological mode (54).

4.1. Strengths and limitations

The study has several strengths and limitations. To our knowledge, this is the first study to investigate the connection of mentalizing and epistemic trust as critical success factors in psychosomatic research. The observational design of this study however limits the causal interpretation of the study results. Nevertheless, since the data were assessed in clinical routine without narrow selection of patients, we consider the results of our study to be representative for patients in inpatient rehabilitation treatments. This is further underscored by the similarity of results compared to other studies in the psychosomatic rehabilitation setting (32).

Due to organizational problems during the first months after opening the rehabilitation facility, routine questionnaire data was not continuously collected, thus resulting in a substantial number of missing data at T2. However, a sensitivity analysis comparing baseline data did not reveal statistically significant differences between patients with complete and missing data at T2 in terms of age, BSI total score, epistemic trust, mistrust or credulity. We therefore assume the data are missing at random.

Future studies should investigate the effectiveness of mentalization focused interventions in comparison to treatment as usual in a randomized controlled study design to allow causal interpretations regarding the specific influence of improved mentalizing and other hypothesized mechanisms of change to improve psychological distress in psychosomatic inpatient treatment.

4.2. Conclusion

In this study, we observed a substantial improvement in psychological distress and HRQOL during psychosomatic inpatient rehabilitation. Our results indicate that improvement in mentalizing can be understood as a potential critical success factor of psychosomatic rehabilitation. We additionally identified potential

predictors of mentalizing, such as improvement of epistemic mistrust, which gives indications for further outcome research and highlights the crucial role of mentalizing and epistemic trust for mental health in adults.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving human participants were reviewed and approved by Board for Ethical Questions in Science of the University of Innsbruck University of Innsbruck 6020 Innsbruck, Austria. The patients/participants provided their written informed consent to participate in this study.

Author contributions

DR and AL contributed to conception and design of the study. AL organized the database and supervised the study. DR performed the statistical analysis and wrote the first draft of the manuscript. All authors contributed to the article and approved the submitted version.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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4.8. PUBLIKATION VIII

Zara S, Brähler E, Sachser C, Fegert JM, Häuser W, Krakau L, & **Kampling H**⁺ & Kruse J⁺ (2023)[#]. Associations of different types of child maltreatment and diabetes in adulthood – the mediating effect of personality functioning: Findings from a population-based representative German sample. *Ann Epidemiol* 78, 47-53. DOI: 10.1016/j.annepidem.2022.12.004

⁺Geteilte Letztautorenschaft



Original article

Associations of different types of child maltreatment and diabetes in adulthood – the mediating effect of personality functioning: Findings from a population-based representative German sample

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ABSTRACT

Purpose: This study aimed to examine the role of personality functioning in the association between various types of child maltreatment (CM) (sexual, physical, and emotional abuse as well as physical and emotional neglect) and diabetes in adulthood.

Methods: Analyses are based on representative data of the German population ($N = 5,041$) from 2016 to 2019. Self-report questionnaires assessed diagnosis of diabetes, child maltreatment (CTQ), personality functioning (OPD-SQS), and symptoms of depression/anxiety (PHQ-4). Odd ratios were calculated to examine the association between CM and diabetes, and mediation analyses including PHQ-4 as covariate were conducted to examine the role of personality functioning.

Results: All CM types significantly elevated the odds of having diabetes in adulthood. Personality functioning mediated the association between abuse and diabetes (sexual: $b = 0.012$, 95% CI [.002, 0.022], $P_M = 25.0\%$, physical: $b = 0.009$, 95% CI [.001, 0.017], $P_M = 12.0\%$, and emotional: $b = 0.013$, 95% CI [.002, 0.024], $P_M = 59.8\%$), but not between neglect and diabetes.

Conclusions: CM is associated with an increased risk of diabetes, with personality functioning being a relevant mediator for CM abuse types. Hence, by focusing on CM prevention and considering impaired personality functioning in diabetes treatment, diabetes self-management and health behavior could be improved.

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Introduction

Child maltreatment (CM) such as emotional, sexual and physical abuse, as well as emotional and physical neglect are a worldwide phenomenon, affecting 31% of the general population in Germany [1]. Recent research has been focusing on the negative implications of CM for patients with diabetes, demonstrating that experiencing CM is associated with a significantly elevated risk of diabetes in adulthood [2–4]. In a representative population-based study, it could be shown that the mere exposure to ≥ 4 types

of CM (compared to none) increased the presence of type 2 diabetes by approximately three times [5]. The adverse impact of CM among patients with diabetes is also reflected by higher mortality rates, higher BMI as well as higher HbA_{1c} values [6,7], emphasizing the relevance of understanding the underlying pathways through which CM and diabetes are linked.

Underlying endocrinological pathways that might explain the relationship between CM and diabetes, such as a dysregulated cortisol stress reactivity, increased inflammatory markers as well as impairments of hormones contributing to obesity, have long been an object of interest [8–13]. Another focus has been on the negative implications of CM on health behavior. There is ample evidence that CM is associated with e.g. increased risk of smoking, physical inactivity, and obesity in the general population [14] – all of which are well researched risk factors for type 2 diabetes [15,16]. The mechanisms through which CM and impaired health behaviors as well as self-management are linked [17,18] have not yet been fully understood. Recent research on the associations of CM and psychopathologies has been focusing on the mediating role of personality functioning [19–21] – a dimensional measure of basic psychological capacities, that has been included in both the recent DSM-5 and ICD-11 [22,23] – which might also play an important role for the development of diabetes (e.g. through unfavorable health behaviors). Personality functioning describes psychological capacities in the areas 1) self-perception and object-perception, 2) self-regulation and regulation of relationships, 3) internal and external communication, as well as 4) attachment to internal and external objects [24] that develop in early childhood [25]. Early experiences of CM, especially if experienced repeatedly, hamper their development, and thus, result in impaired personality functioning. With regard to diabetes, it has already been shown that certain aspects of personality are associated with diabetes-related distress, diabetes treatment adherence, and self-care behavior [17,18,26]. Therefore, considering personality functioning in patients with diabetes might help to broaden our understanding of the association between CM and diabetes.

To our knowledge, there are no studies investigating the role of personality functioning in patients with CM and diabetes. Based on a representative population-based sample of the German population, the aim of our study was to examine (1) the association between different types of CM and diabetes in adulthood and (2) the mediating effect of personality functioning in the relationship between different types of CM and diabetes in adulthood.

Material and methods

Survey method and participants

For this study, data from two survey waves of the representative surveys conducted in cooperation with the independent demography research institute USUMA Berlin were evaluated. Data of a representative sample of the German population were collected between October and November 2016 ($N = 2,510$) and May and July 2019 ($N = 2,531$), yielding a total of $N = 5,041$ participants. For each survey, the procedure was the same. Households within predefined regions were selected by a random route procedure. In households with multiple persons, one person was randomly selected using the Kish-Selection-Grid. Inclusion criteria were sufficient German language skills, an age > 14 and informed consent before taking part in the study. The surveys were 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 by the Ethics Committee of the Medical Fac-

ulty of the University of Leipzig for each survey (no. 297/16-ek & no. 145/19-ek).

Assessment

Child maltreatment

Different forms of CM were assessed with the Childhood Trauma Questionnaire (CTQ), which is a widely used screening tool for childhood abuse and neglect and used in adults and adolescents from the age of 12. Participants answer questions regarding sexual, emotional and physical abuse and emotional and physical neglect on a scale with response options ranging from 1=“not at all” to 5=“very often.” Each subscale consists of 5 items, resulting in sum scores for each subscale from 5 to 25 and hence, for the total questionnaire from 25 to 125. According to Häuser and colleagues [27], the degree of severity is classified as *none to minimal*, *low to moderate*, *moderate to severe* and *severe to extreme*. Prevalences for each type of CM are calculated by evaluating CM as present for each person who has at least experienced moderate to severe CM. The German version of the CTQ was validated by Klinitzke and colleagues [28] and shows good internal consistency, except for physical neglect: sexual abuse: $\alpha=0.89$, physical abuse: $\alpha=0.80$, emotional abuse: $\alpha=0.87$, physical neglect: $\alpha=0.55$ and emotional neglect: $\alpha=0.83$. In this study, with the exception of physical neglect, the CTQ showed good to excellent total internal consistency and subscale internal consistency as follows: total: $\alpha=0.87$, sexual abuse: $\alpha=0.92$, physical abuse: $\alpha=0.84$, emotional abuse: $\alpha=0.86$, physical neglect: $\alpha=0.55$ and emotional neglect: $\alpha=0.86$.

Personality functioning

The OPD-SQS is a self-report questionnaire to screen for deficits in personality functioning. It comprises the three subscales, 1) self-perception, 2) interpersonal contact, and 3) relationship model, with four items on each scale. 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. While the subscale “self-perception” addresses identity perception and self-reflective capacities (e.g. “If I think a lot about myself, I get confused.”), the scale “interpersonal contact” refers to interrelation and communication with others (e.g. “I sometimes misjudge how my behavior affects others.”). The subscale “relationship model” relates to relationship experiences and attachment (e.g. “If you let others get too close, it can be dangerous.”). The OPD-SQS showed good internal consistency ($\alpha=0.88$) [29]. In the present study, the internal consistency and the total scales’ consistency are as follows: total: $\alpha=0.89$, self-perception: $\alpha=0.86$, interpersonal contact: $\alpha=0.77$ and relationship model: $\alpha=0.81$.

Depression/anxiety symptoms

To assess symptoms of depression/anxiety, the Patient Health Questionnaire (PHQ-4) consisting of four items was used [30]. It comprises two items of the Generalized Anxiety Disorder Scale-2 (GAD-2) to assess anxiety symptoms and the PHQ-2 to assess depression symptoms. Response options range from 0=“not at all” to 3=“nearly every day,” resulting in a sum score ranging from 0 to 12, with scores > 6 indicating a probable presence of a depressive or anxiety disorder and scores > 9 indicating a highly probable presence of a depressive or anxiety disorder. The PHQ-4 showed acceptable to good reliability with McDonald’s omega of $\omega=0.85$ (PHQ-2: $\omega=0.77$, GAD-2: $\omega=0.78$) [31]. In the present sample, the internal consistency was good with Cronbach’s $\alpha=0.87$.

Diabetes

Information on diabetes was obtained through the self-report questions: “Is your health currently impaired by any of the fol-

lowing health problems? Please answer all questions for the diseases below. Are you restricted in your activity as a result?" in the first survey wave and "Have you ever been diagnosed with diabetes mellitus by a doctor?" in the second survey wave. In the total sample, those answering one of the two questions with "yes" were considered as patients with diabetes.

Sensitivity analyses

To account for the unavailable separation of type 1 and type 2 diabetes in our sample, we conducted sensitivity analyses for the odd ratios as well as the mediation analyses only with participants aged ≥ 30 years. The results are reported in detail in a supplementary data article [32]. In addition, correlation analyses for all CM types, personality functioning, diabetes as well as symptoms of depression/anxiety are provided. Further, we examined whether symptoms of depression/anxiety are elevated in patients with diabetes and CM compared to patient with diabetes but no experiences of CM.

Statistical analyses

All statistical analyses were conducted in IBM SPSS Statistics version 28. Prevalences for each subtype of CM and diabetes were calculated with a weight variable, providing population representative numbers. To test the association of CM and diabetes, CM was computed into a dichotomous variable with CM being evaluated as present, when at least moderate severity was given (according to Häuser and colleagues [27]) and then, odd ratios (ORs) were calculated. To test whether personality functioning has a mediating effect in the association of CM and diabetes, mediation analyses were performed separately for each type of CM, using the PROCESS macro version 4.1 by Hayes [33] for IBM SPSS Statistics. The respective CTQ subscale sum score was entered as independent variable, the OPD-SQS sum score was entered as mediator and to control for symptoms of depression/anxiety, the PHQ-4 sum score was included as covariate. The mediation effect is evaluated by employing bootstrapped 95% confidence intervals (CI) for the indirect effect of CM on diabetes through personality functioning. Mediation emerges, when the CI for the indirect effect exclude zero [34,35]. Additionally, the proportion of the mediating effect as a proportion of the total effect, P_M , was calculated [36,37]. For all analyses, significance level was set at $\alpha=0.05$.

Results

Sample characteristics

The representative population-adjusted prevalence of diabetes was 6.5%. Across all participants ($N = 5,041$), 20.4% ($n = 1,028$) reported experiencing at least one type of CM with at least moderate severity. Among patients with diabetes ($n = 337$), 32.0% ($n = 108$) and among patients without diabetes 19.4% ($n = 905$) reported at least one type of CM with at least moderate severity. In the total sample, the weight-adjusted prevalence of sexual abuse was 5.7%, of physical abuse 6.0%, of emotional abuse 5.8%, of physical neglect 23.5%, and of emotional neglect 12.6%. In the total sample, 7.6% screened positive for depression and 7.2% screened positive for anxiety. In patients with diabetes, 15.9% screened positive for depression and 14.2% screened positive for anxiety. In Table 1, detailed sociodemographic and psychological characteristics of the total sample and patients with and without diabetes are presented.

Association between different types of child maltreatment and diabetes in adulthood

The odds of reporting diabetes were significantly elevated for all five types of CM (sexual abuse: OR=1.9, 95% CI [1.298, 2.81]; physical abuse: OR=2.2, 95% CI [1.529, 3.143]; emotional abuse: OR=2.0, 95% CI [1.349, 2.837]; physical neglect: OR=2.1, 95% CI [1.545, 2.949], emotional neglect: OR=1.2, 95% CI [0.803, 1.889]). See also Table 2.

Mediation analyses of diabetes, personality functioning and types of child maltreatment

Mediation analyses conducted with symptoms of depression/anxiety as covariate revealed a significant indirect effect of sexual abuse on diabetes through personality functioning, $b = 0.012$, 95% CI [.002, .022], of physical abuse, $b = 0.009$, 95% CI [.001, .017], and of emotional abuse, $b = 0.013$, 95% CI [.002, .024]. The indirect effects of physical neglect and emotional neglect on diabetes through personality functioning were not significant, as the confidence intervals include zero ($b = 0.002$, 95% CI [−0.002, .006] and $b = 0.003$, 95% CI [−0.001, .008]). For the mediation models with a significant indirect effect, the proportion mediated (P_M) amounts to 59.8% for emotional abuse, 25.0% for sexual abuse and 12.0% for physical abuse. See also Figure 1.

Discussion

The aim of this study was to examine the association between different types of CM (sexual, physical, and emotional abuse as well as physical and emotional neglect) and diabetes in adulthood, and further, to investigate the role of personality functioning in this association.

Our results show that based on a representative sample of the German population, irrespective of the type, CM significantly elevates the odds of reporting diabetes in adulthood. We show that the highest odds of reporting diabetes persist after experiences of physical abuse or physical neglect, followed by emotional and sexual abuse. In contrast, experiences of emotional neglect showed the lowest odds of reporting diabetes. Although previous literature generally indicates an association between CM and diabetes, the findings for the more specific subtypes of CM are heterogeneous. Some studies found sexual and physical abuse being the strongest predictor for diabetes [4,38], while other evidence found the strongest association between neglect and diabetes [2]. In contrast, a recent representative prospective cohort study including $N = 2,973$ patients only found a significant association between emotional abuse and type 2 diabetes [39]. Methodological differences might partly explain the diverse results, as e.g. some of the mentioned studies did not investigate physical and emotional neglect separately, or the result is based on either clinical or representative samples. In addition, the measurements of the neglect construct often vary greatly, which might results in heterogeneous findings. Further, neglect can also be influenced by socioeconomic status or historical circumstances [28], i.e. individuals with a low socioeconomic status, which is related to ethnicity or nativity, have a higher probability of experiencing more financial concerns, parental stress, environmental stressors as well as barriers to (mental) healthcare. Future studies should examine the association between different types of CM and diabetes, especially physical and emotional neglect, with particular regard to methodological challenges.

To our knowledge, this is the first study considering personality functioning in the association between CM and diabetes. We performed mediation analyses examining personality functioning as a potential mediator between different subtypes of CM and diabetes,

Table 1

Demographic and clinical characteristics of the total sample and patients with and without diabetes

Age	Total sample (N = 5,041)*		Patients with diabetes† (n = 337)		Patients without diabetes (n = 4,660)	
	n	(%)	n	(%)	n	(%)
14–24	561	(11.1)	8	(2.4)	549	(11.9)
25–34	768	(15.2)	11	(3.3)	747	(16.0)
35–44	786	(15.6)	27	(8.0)	753	(16.2)
45–54	940	(18.6)	39	(11.6)	894	(19.2)
55–64	894	(17.7)	76	(22.6)	806	(17.3)
65–74	683	(13.5)	95	(28.2)	585	(12.6)
> 75	409	(8.1)	81	(24.0)	326	(7.0)
Sex						
Male	2,352	(46.7)	157	(46.6)	2,174	(46.7)
Female	2,689	(53.3)	180	(53.4)	2,486	(53.3)
Partnership status						
Married, living together	2,194	(43.7)	149	(44.2)	2,026	(43.7)
Married, living apart	123	(2.5)	12	(3.6)	110	(2.4)
Single	1,547	(30.8)	39	(11.6)	1,490	(32.1)
Divorced	715	(14.2)	65	(19.3)	647	(13.9)
Widowed	441	(8.8)	72	(21.4)	366	(7.9)
Educational status						
< 10 y of education	1,560	(30.9)	166	(49.4)	1,385	(29.7)
10 – 13 y of education	2,812	(55.8)	133	(39.5)	2,654	(57.0)
> 13 y of education	499	(9.9)	35	(10.4)	455	(9.8)
Other qualification	158	(3.1)	2	(0.6)	155	(3.3)
Income‡						
1: < 1,250 €	736	(14.6)	86	(27.0)	647	(14.3)
2: 1,250 – 2,500 €	1,968	(39.0)	138	(43.4)	1,808	(40.0)
3: > 2,500 €	2,971	(43.2)	94	(29.6)	2,068	(45.7)
	M	(SD)	M	(SD)	M	(SD)
OPD-SQS§						
OPD-SQS sum score	11.13	(8.33)	13.78	(8.62)	10.96	(8.26)
OPD-SQS self-perception	1.97	(2.81)	2.50	(3.00)	1.94	(2.79)
OPD-SQS interpersonal contact	3.54	(3.14)	4.58	(3.34)	3.46	(3.10)
OPD-SQS relationship model	5.62	(3.78)	6.81	(3.77)	5.57	(3.76)
PHQ-4						
PHQ-4 sum score	1.47	(2.14)	2.37	(2.57)	1.41	(2.09)
PHQ-2 depression	0.78	(1.17)	1.27	(1.40)	0.74	(1.15)
GAD-2 anxiety	0.70	(1.12)	1.11	(1.35)	0.67	(1.10)
CTQ¶						
CTQ sexual abuse						
yes	11.76	(4.30)	13.18	(4.92)	11.55	(4.21)
no	5.06	(0.34)	5.06	(0.34)	5.06	(0.34)
CTQ physical abuse						
yes	13.36	(3.19)	13.66	(3.67)	13.32	(3.12)
no	5.30	(0.87)	5.57	(1.12)	5.28	(0.85)
CTQ emotional abuse						
yes	16.40	(3.40)	15.74	(3.14)	16.49	(3.46)
no	6.01	(1.71)	6.34	(2.03)	5.99	(1.69)
CTQ physical neglect						
yes	12.26	(2.21)	12.55	(2.17)	12.21	(2.21)
no	6.35	(1.51)	6.83	(1.63)	6.32	(1.50)
CTQ emotional neglect						
yes	18.38	(3.02)	19.19	(3.42)	18.33	(2.98)
no	8.13	(2.74)	8.89	(2.90)	8.09	(2.72)

* Missings: n = 44 people did not provide any information about their diabetes status.

† self-reported diabetes.

‡ equivalized household income.

§ OPD-Structure Questionnaire.

|| Patient Health Questionnaire.

¶ Childhood Trauma Questionnaire.

while controlling for symptoms of depression/anxiety by including the PHQ-4 sum score as covariate. Prior research suggests that having experienced CM is also associated with mental disorders, such as depressive and anxiety disorders [40,41], and this association is in part mediated by personality functioning [19,20]. This is an important aspect that should not be overlooked, since symptoms of depression/anxiety are often present in patients with diabetes. Diabetes has shown to increase the risk of depressive symptomatology [42], while conversely, depressive symptomatology increases the risk of developing type 2 diabetes by 34% [43]. Further, studies have shown that for patients with diabetes the risk of developing an anxiety disorder compared to patients without diabetes is

doubled, with fears of acute complications, such as hypoglycemia or subsequent diseases and complications (microvascular complications, e.g. retinopathies, and macrovascular complications), being most prevalent [44]. Controlling for the most prevalent mental health issues – namely symptoms of depression/anxiety – allowed us to focus on the distinct effect of personality functioning.

Our mediation analyses revealed a mediating effect of personality functioning in the association between sexual, physical and emotional abuse and diabetes, but not in the association between physical and emotional neglect and diabetes, emphasizing the interplay of early experiences of abuse and impaired personality functioning for patients with diabetes. Considering personal-

Table 2
Odd ratios relating various types of child maltreatment* to diabetes†

Child maltreatment	Diabetes (n = 337)		No diabetes (n = 4660)		Odd ratio	95%-CI	
	n	(%)	n	(%)		LL	UL
Sexual abuse					1.900	1.298	2.781
yes (n = 287)	33	(11.5)	254	(88.5)			
no (n = 4,687)	300	(6.4)	4,387	(93.6)			
Physical abuse					2.192	1.529	3.143
yes (n = 294)	38	(12.9)	256	(87.1)			
no (n = 4,683)	297	(6.3)	4,386	(93.7)			
Emotional abuse					1.956	1.349	2.837
yes (n = 296)	35	(11.8)	261	(88.2)			
no (n = 4,676)	300	(6.4)	4,376	(93.6)			
Physical neglect					2.135	1.545	2.949
yes (n = 545)	64	(11.7)	481	(88.3)			
no (n = 1,909)	112	(5.9)	1,797	(94.1)			
Emotional neglect					1.231	0.803	1.889
yes (n = 319)	27	(8.5)	292	(91.5)			
no (n = 2,133)	149	(7.0)	1,984	(93.0)			

* Child maltreatment (CM) was measured with the Childhood Trauma Questionnaire (CTQ), the presence of CM was assumed when severity was at least *moderate*. Of the total sample (N = 5,041), 20.4% report at least one type of CM.

† Diabetes was assessed via self-report.

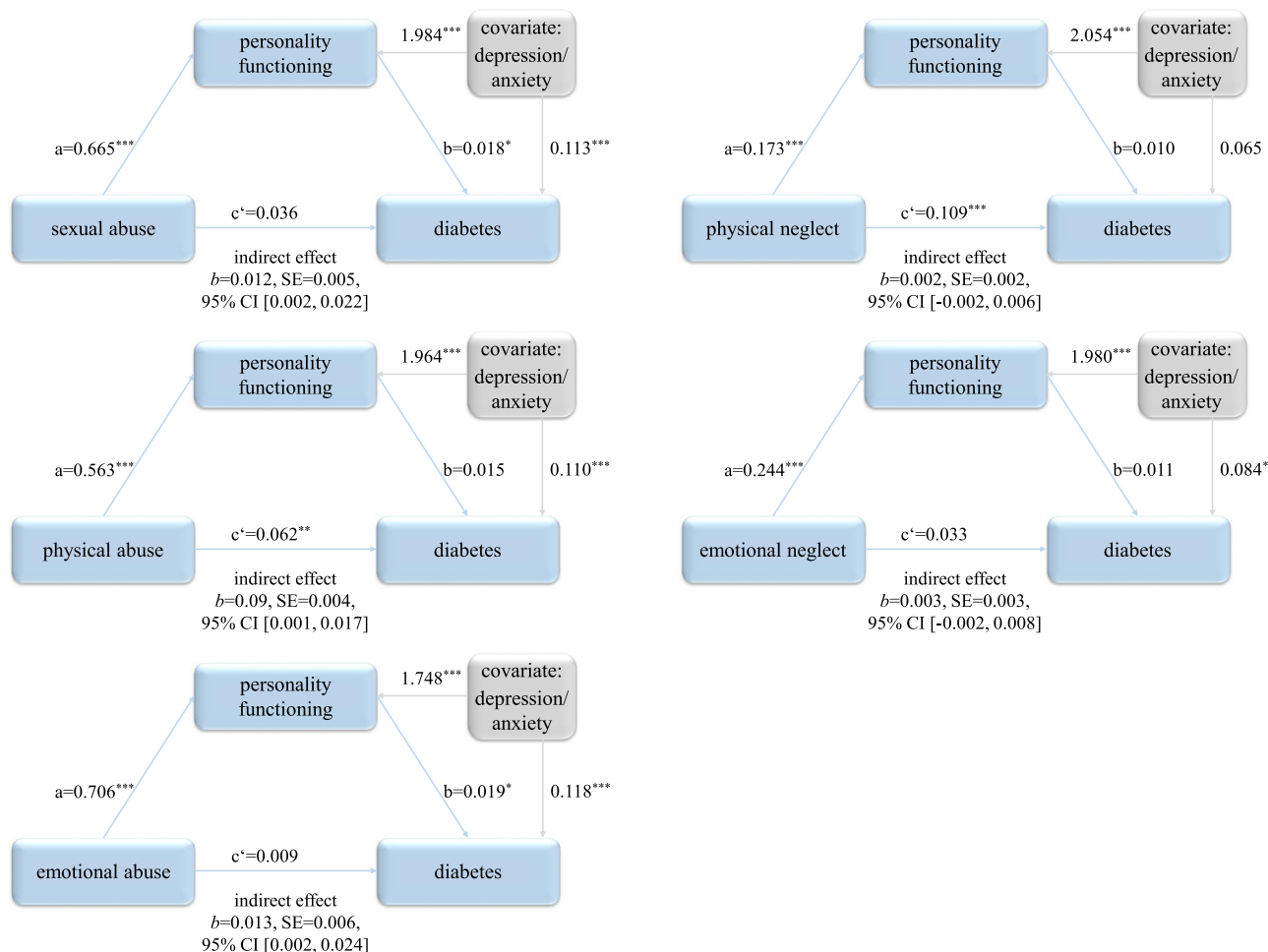


Fig. 1. Path diagrams for each mediation analysis conducted, showing the total effect (c') of the abuse or neglect type of child maltreatment (CM) on diabetes and the indirect (mediating) effect of the abuse or neglect type of CM on diabetes through personality functioning. P -values: * $p \leq .05$, ** $p \leq 0.01$, *** $p \leq .001$.

ity functioning in patients with diabetes is not completely novel. However, previous research rather considered distinct constructs related to personality functioning instead of personality functioning as an overall mechanism. Personality traits [45] and emotion regulation [24] with respect to their impact on health behavior and self-management gained much attention. For example, it could

be shown that high neuroticism affects medication adherence as well as self-care behavior in patients with type 2 diabetes [17]. Another study showed that in patients with type 1 diabetes, emotion dysregulation is associated with deliberate insulin restriction as a specific form of disordered eating [46]. Additionally, literature suggests that impaired emotion regulation is associated with emo-

tional eating, a sedentary lifestyle, and reduced physical activity in children [47], which can promote obesity and are well known risk factors associated with type 2 diabetes [48,49]. Based on this evidence, it might be possible that CM abuse and diabetes are associated through impaired personality functioning and its potentially inherent poor health behavior and self-management. Particularly regarding self-management, a study among patients with type 2 diabetes and poor glycemic control found that higher levels of personality functioning predicted a greater incline of HbA_{1c}-values over a 6-month period [50]. Further research is needed to investigate the direct effect of personality functioning on both health behavior and self-management in patients with CM and diabetes as well as its impact on the course of the disease.

Strengths and limitations

A major strength of the present study is the large representative sample of the German population in which the study has been conducted. We add to the evidence of studies which used broader measures for adverse childhood experiences, including e.g. growing up with a parent having a mental illness, by being able to measure CM more precisely and considering the different abuse and neglect subtypes. Further, by using a dimensional yet economical measure of personality functioning, a broad range of psychological capacities could be considered in the association between CM and diabetes. Research on personality functioning is still limited and to our knowledge, this is the first study to examine its role in the association between different types of CM and diabetes.

When interpreting results, some limitations of this study must be recognized. First, the cross-sectional design does not allow conclusions regarding cause and effect between CM, personality functioning and diabetes in adulthood. Further, diabetes in adulthood was assessed via self-report and the design of the data collection did not permit separate investigations of people with type 1 diabetes and type 2 diabetes. Therefore, our data only allow for an overview of type 1 and type 2 diabetes, disregarding the different pathomechanisms of the diabetes types. Hence, future studies should investigate CM and personality functioning for type 1 and type 2 separately. To account for this limitation to a certain degree, we conducted sensitivity analyses with a population ≥ 30 years, presumably minimizing the percentage of people with type 1 diabetes (see sensitivity analyses). In this subsample, we found comparable results. Additional indicators of health such as BMI, smoking or alcohol consumption to consider and control for in the analyses were not available. Further, sociodemographic variables which might influence the occurrence of CM, such as race, ethnicity and nativity, were not included in the dataset. Accounting for frequency and severity of CM might have provided further insights into the association between CM and diabetes.

Conclusion

Our results show that all experiences of CM significantly elevate the odds of reporting diabetes in adulthood, and thus, highlight the relevance of examining the impact of different types of CM for patients with diabetes. We demonstrate that impaired personality functioning (partly) mediates the association between CM abuse and diabetes in adulthood, implying its significance for this patient group. Alongside CM, impaired personality functioning might contribute to diabetes risk by affecting self-management and health behavior – however, future studies should explore this possible interrelationship. Since it has been shown that improving personality functioning is possible through psychotherapy [51], addressing might be beneficial for interventions aiming at improving health behavior and self-management in patients with diabetes.

Author contributions

EB designed the survey, collected the data, and obtained the ethics approval. JK, JMF, WH and CS contributed to data collection. SZ and HK participated in the research design. SZ conducted the data analyses, interpreted the data and wrote the original draft of the manuscript. HK contributed to the writing of the manuscript. HK and JK supervised the drafting of the manuscript. JK, LK, EB, JMF, WH and CS reviewed and edited the manuscript; all authors approved the final version of the manuscript.

Data statement

Data for this article are made publicly available at <https://data.mendeley.com/datasets/rkw2g38rjp/1>.

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4.9. PUBLIKATION IX

Kampling H⁺, Köhler B⁺, Germerott I, Haastert B, Icks A, Kulzer B, Nowotny B, Hermanns N, & Kruse J (2022)[#]. An Integrated Psychosomatic Treatment Program for People with Diabetes (psy-PAD): Results of a Randomized Controlled Trial. *Dtsch Arztebl Int*, 119, 245-252. DOI: 10.3238/arztebl.m2022.0094

⁺Geteilte Erstautorenschaft

Original Article

An Integrated Psychosomatic Treatment Program for People with Diabetes (psy-PAD)

Results of a Randomized Controlled Trial

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Summary

Background: Many people with diabetes have permanently elevated blood sugar concentrations and a high level of diabetes-related psychological stress, also called “diabetes distress.” In clinical practice, diabetes distress is often an impediment to successful self-management. psy-PAD is a psychodynamically oriented short-term therapy program whose goal is to reduce diabetes distress and improve glycemic control.

Methods: A randomized controlled trial was conducted with 143 patients with either type 1 or type 2 diabetes who were being treated in eleven specialized diabetological practices. psy-PAD in the intervention group (eight sessions) was compared with optimized standard care as the control condition. The inclusion criteria were HbA1c $\geq 7.5\%$ combined with diabetes distress (PAID >35 , or doctor’s determination). The primary endpoint was the HbA1c at six months (t_1). Diabetes-related distress (PAID), depressive symptoms (HADS-D, PHQ-9), anxiety symptoms (HADS-A), health-related quality of life (SF-36), panic (short form of the PHQ-D), body mass index (BMI), and triglyceride levels were secondary endpoints. Follow-ups were conducted at six (t_1) and 12 months (t_2) (trial registration: DRKS00003247).

Results: The intergroup comparison at t_1 revealed a significant, clinically relevant reduction of HbA1c by -0.53 percentage points (95% confidence interval $[-0.89; -0.16]$, $p = 0.005$). The secondary analyses revealed relevant differences in the point estimators for diabetes distress at t_1 and t_2 , depressive symptoms at t_2 and BMI at t_1 .

Conclusion: For people with diabetes and diabetes distress who do not achieve satisfactory glycemic control despite intensive treatment in specialized diabetological practices, integrated psychosomatic-psychotherapeutic treatment can lower blood sugar levels over the intermediate term and also reduce diabetes distress and depressive symptoms over a one-year period.

Cite this as

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With rising prevalences, more than 8 million people were diagnosed with type 2 diabetes mellitus in Germany in 2020. To this figure one can add approximately 32,000 children and adolescents, as well as around 340,000 adults, diagnosed with type 1 diabetes (1). Acute metabolic crises in the form of severe hyperglycemia, life-threatening hypoglycemia, and the development of micro-/macrovascular complications contribute to the increased risk of mortality compared with the normal population (2–5). Therefore, one of the primary treatment goals of diabetes therapy is to achieve balanced blood sugar metabolism control in order to prevent the risk of acute crises and the development of diabetic complications. Despite intensive health policy efforts, for example in the form of disease management programs (DMPs) or specific diabetes education/training programs, unsatisfactory metabolic control is still found in a relevant proportion of patients. For example, according to the North Rhine DMP report, 58.4% of all people with type 1 diabetes and 40.4% with type 2 diabetes fail to achieve the blood sugar target levels agreed upon (usually $< 7.5\%$) (6).

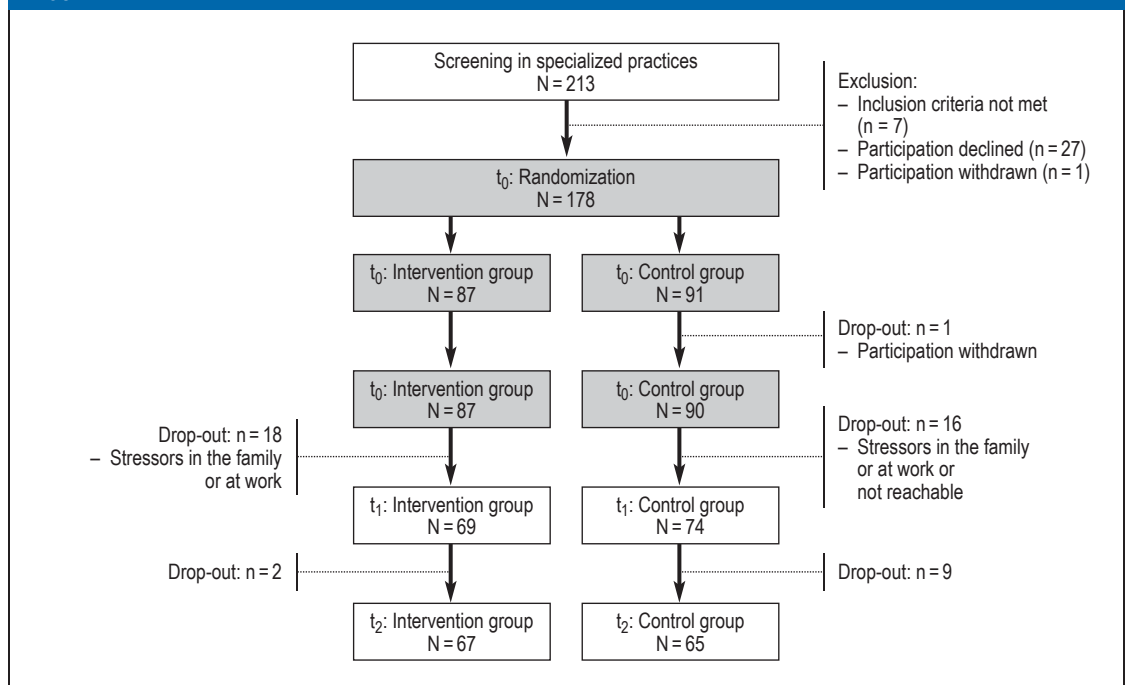
Patients’ self-management behavior plays a central role in blood sugar control. Reasons for unfavorable self-management behavior can be patient-related, practitioner-related, or environment-related. Against this backdrop, psychosomatic aspects increasingly come to the fore. Many people with diabetes experience a high level of diabetes-related psychological stress, also referred to as “diabetes distress,” (type 1: $\sim 44\%$; type 2: $\sim 25\%$ [7]), as well as comorbid mental illnesses, such as depressive disorders (type 1 $\sim 6\%$ [8]; type 2 $\sim 15\%$ [9]) and anxiety disorders (type 1: $\sim 8\%$ [8]; type 2: $\sim 7\%$ [10]). These result not only in impediments to diabetes self-management and reduced quality of life but also in poorer glycemic control (11, 12), an increased risk of complications (13) and mortality (2–5), as well as significantly increased costs (14). By focusing psychosocial treatment approaches on reducing diabetes distress, it may be possible to help affected individuals reduce impediments to treatment and, thus, also achieve

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Flowchart
on inclusion and
course of study

FIGURE



improvements in their glycemic control. On an international level, integrated treatment approaches enabling access to structured interdisciplinary care concepts that are integrated in primary care have been shown to be effective, with heterogeneous results seen in terms of HbA1c improvement (15, 16).

This study evaluates a cross-sectoral, psychodynamically oriented, integrated psychosocial and psychosomatic treatment program for patients with diabetes (psy-PAD), which is implemented in a collaboration between psychosomatic outpatient clinics and diabetologists in specialized practices. The assumption is that psy-PAD can achieve a significant improvement in glycemic control (HbA1c) compared to optimized standard care. Reductions in diabetes distress, depressive symptoms, and anxiety, as well as an increase in health-related quality of life, were also anticipated.

Methods

The study was conducted as a two-armed randomized controlled trial (RCT). In contrast to the data held by the German Registry of Clinical Trials (DRKS), the HbA1c at t_2 that was erroneously filed there does not represent a primary endpoint; this also applies to all prospectively submitted documents, such as the ethics application and the application to the German Medical Association (*Bundesärztekammer*, BÄK) for funding. Due to the complexity of practical implementation in routine care in specialized diabetological practices, and in contrast to the original study protocol, the inclusion

criterion “significant distress in the management of diabetes” was not evaluated by means of PAID alone, but also by the clinical impression of the treating diabetologists. Therefore, inclusion criteria included diagnosed type 1/type 2 diabetes, age between 18–70 years, previous completion of diabetes training, HbA1c $\geq 7.5\%$, and significant diabetes distress (determined by PAID > 35 or identified by the treating diabetologist). Exclusion criteria included severe comorbid physical illness (for example, oncological disease), dementia, severe mental illness (for example, severe depressive episode, psychosis, addiction disorder), as well as insufficient knowledge of the German language. Recruitment was carried out in 11 specialized diabetological practices by means of informed consent.

In addition to standard care, patients in the intervention group (IG) received the short intervention psy-PAD. This is based on a low-threshold, psychodynamically oriented short-term therapy program, the goal of which is to achieve a reduction in psychosocial impediments to treatment and diabetes distress, thereby also improving metabolic control. In terms of content, it integrates elements from self-management therapy and solution-oriented psychotherapy in four phases (see also Köhler and Kruse [17] as well as *eMethods Section 1*). The psy-PAD program comprised eight individual sessions, which were initially held weekly ($4 \times$) and later monthly ($4 \times$) by psychotherapists from the psychosomatic outpatient department, Gießen, Germany, in the specialized practice. Patients in the control group (CG)

TABLE 1

Sociodemographic data at t_0

	Total (N = 143)	IG (n = 69)	CG (n = 74)
Sex n (%)			
– Females	92 (64.3)	43 (62.3)	49 (66.2)
– Males	51 (35.7)	26 (37.7)	25 (33.8)
Age M (SD)			
– In years	48.0 (11.7)	49.4 (11.6)	46.7 (11.8)
Marital status n (%)			
– Single	25 (17.5)	12 (17.4)	13 (17.6)
– Married/living in a partnership	98 (68.5)	49 (71.0)	49 (66.2)
– Divorced/separated/widowed	20 (14.0)	7 (10.1)	10 (13.5)
Highest school-leaving qualification n (%)			
– Lower secondary school or elementary school-leaving certificate	43 (30.1)	23 (33.3)	20 (27.0)
– Secondary school certificate/polytechnic high school	45 (31.5)	23 (33.3)	22 (29.8)
– (Subject-specific) university entrance qualification/general university entrance qualification	51 (35.7)	20 (29.0)	31 (41.9)
– Other	4 (2.8)	3 (4.4)	1 (1.4)
Occupational activity in the preceding 6 months n (%)			
– Employed full-time	54 (37.8)	28 (40.6)	26 (35.1)
– Employed part-time	33 (23.1)	17 (24.6)	16 (21.6)
– Unemployed	6 (4.2)	2 (2.9)	4 (5.4)
– Unable to work	6 (4.2)	3 (4.4)	3 (4.1)
– Pension/retirement/early retirement	28 (19.6)	12 (17.4)	16 (21.6)
– Other activity	16 (11.2)	7 (10.1)	9 (12.2)
Incapacity for work in the preceding 6 months n (%)			
– Yes	69 (48.3)	36 (52.2)	33 (44.6)
Duration of incapacity to work^{*1} M (SD)			
– In days	35.4 (58.5)	47.1 (70.6)	22.7 (38.7)
– Quartiles (Q1/median/Q3)	5.0/14.0/35.0	8.5/21.0/53.0	5.0/8.0/23.0
Diabetes type n (%)			
– Type 1 diabetes	68 (47.6)	31 (44.9)	37 (50.0)
– Type 2 diabetes	75 (52.5)	38 (55.1)	37 (50.0)
Time since diabetes diagnosis M (SD)			
– In years	16.1 (10.6)	15.2 (10.5)	16.9 (10.8)
– Quartiles (Q1/median/Q3)	8.0/13.0/24.0	7.0/12.0/22.0	8.0/14.5/24.0
Glucose metabolism regulation M (SD)			
– HbA1c	8.7 (1.1)	8.8 (1.2)	8.6 (1.1)
Concomitant diseases and complications^{*2} n (%)			
– Nephropathy	27 (19.4)	13 (19.7)	14 (19.2)
– Retinopathy	37 (26.6)	16 (24.2)	21 (28.8)
– Neuropathy	58 (41.7)	26 (39.4)	32 (43.8)
– Diabetic foot syndrome/amputation on the feet	16 (11.5)	8 (12.1)	8 (11.0)
– Cardiovascular diseases	24 (17.3)	10 (15.2)	14 (19.3)
– Stroke	2 (1.4)	1 (1.5)	1 (1.4)
– Other diseases	116 (83.5)	56 (84.8)	60 (82.2)
Inpatient treatment in the preceding 6 months^{*3} n (%)			
– Yes	30 (21.1)	13 (18.8)	17 (23.3)

^{*1} In relation to participants unable to work in the preceding 6 months; ^{*2} n = 3 missing in the IG and n = 1 missing in the CG; ^{*3} n = 1 missing in the CG
IG, intervention group; CG, control group; M, mean; SD, standard deviation

received standard care in the specialized practices and also received a consultation in the psychosomatic outpatient department at baseline, as well as brief verbal contact with the psychosomatic department at 6 and 12 months. If, as part of this, any evidence of mental illness came to light, the patients were informed about treatment options. The treating diabetologist was also accordingly informed (= optimized standard care).

Data collection was conducted at three measurement time points, t_0 (= pre-intervention), t_1 (= 6 months post intervention), and t_2 (= 12 months post intervention). The primary outcome was HbA1c at t_1 (Bio-Rad VARIANT II; centralized determination at the certified laboratory of the German Diabetes Center, Düsseldorf). Secondary outcomes included body mass index (BMI) and triglyceride levels, as

TABLE 2

Mental health at t_0			
	Total (N = 143)	IG (n = 69)	CG (n = 74)
PAID M (SD)	40.27 (18.62)	41.59 (18.23)	39.04 (19.02)
SCID-I: mood disorder n (%)			
– Currently	67 (46.85)	31 (44.93)	36 (48.65)
– In previous history	64 (44.76)	33 (47.83)	31 (41.89)
SCID-I: major depression n (%)			
– Currently	34 (23.78)	18 (26.09)	16 (21.62)
– In previous history	63 (44.06)	32 (46.38)	31 (41.89)
HADS: depression M (SD)	7.22 (4.38)	7.38 (4.55)	7.08 (4.25)
HADS: anxiety M (SD)	7.29 (3.81)	7.32 (3.94)	7.27 (3.71)
SF-36 M (SD)			
– Mental health	38.28 (11.70)	38.18 (12.59)	38.37 (10.89)
– Physical health	44.38 (10.27)	44.30 (9.28)	44.45 (11.18)
PHQ-9: depressive symptoms n (%)			
– Minimal (1–4 points)	21 (14.69)	11 (15.94)	10 (13.51)
– Mild (5–9 points)	47 (32.87)	22 (31.88)	25 (33.78)
– Moderate (10–14 points)	48 (33.57)	23 (33.33)	25 (33.78)
– Severe (15–27 points)	27 (18.88)	13 (18.84)	14 (18.92)
PHQ-D: panic disorder n (%)			
– Yes	9 (6.29)	8 (11.59)	1 (1.35)
– No	134 (93.71)	61 (88.41)	73 (98.65)
Contact with a psychotherapist in the preceding 6 months n (%)			
– Yes	22 (15.4)	10 (14.5)	12 (16.2)

IG, intervention group; CG, control group; M, mean; SD, standard deviations

well as diabetes-related distress (PAID) (18–20), anxiety and depressive symptoms (HADS) (21), health-related quality of life (SF-36) (22), and panic and depressive symptoms (PHQ-D and PHQ-9, respectively) (23), as recorded using questionnaires. Screening to exclude dementia and severe depressive episodes was performed using DemTect (24) and SCID-I (25). Further details on the instruments used are provided in the *eMethods Section 2*. Information on sample size, power, randomization, and blinding can be found in *eMethods Section 3*.

Statistical analyses

The analysis was performed according to the intention-to-treat (ITT) principle. All participants that had taken part in the first follow-up at t_1 were selected as the study population. Baseline characteristics were described separately for the intervention and control groups by frequency distributions, means (M) $\pm$ standard deviations (SD), and, for triglyceride levels, by geometric means (GM)*:/: standard deviation factors (SDF). Normal distributions were assumed for the primary outcome HbA1c and the (continuous) secondary outcomes, while a log-normal distribution was assumed for the triglyceride levels distributed with a right skew.

In accordance with the sample size determination, individual HbA1c differences (Delta t_1-t_0) between the intervention and control groups were compared using the independent groups t-test. In addition, sensitivity analyses using last observation carried forward (LOCF) analysis were performed based on the ITT population for the primary parameter of difference in HbA1c between t_0 and t_1 with group comparison by means of t-test. Here, in accordance with LOCF, the HbA1c difference value of 0 was imputed between t_0 and t_1 . Secondary analyses were performed using linear mixed models with adjustment for baseline values at t_0 and for dependencies arising from repeated measures in both groups. For adjustment following repeated measures, the general covariance structure was selected. Analyses were performed using SAS Version 9.4 (STAT 15.2).

Results

Of the N = 213 patients screened in the specialized diabetological practices, n = 178 met the inclusion or exclusion criteria and were randomized to one of the two study conditions (see the *Figure* for details on patient flow and drop-out reasons). The sensitivity analysis for the primary outcome HbA1c at t_1 was based on the ITT population (N = 177), which also

included the $n = 34$ (IG: $n = 18$; CG: $n = 16$) patients hitherto not included, for which no data regarding HbA1c at t_0 or t_1 were available. There was also no baseline value at t_0 for $n = 4$ patients in the IG and $n = 5$ patients in the CG.

Overall, data on t_0 and t_1 were available for $n = 143$ individuals, meaning that these were included in the evaluations (IG: $n = 69$; CG: $n = 74$, drop-out rate 19.7%). There were no patients for whom data were available at t_2 but not at t_1 . Patient recruitment took place between February 2010 and June 2014. *Tables 1 and 2* provide an overview of sociodemographics as well as information on mental health at t_0 . A representation of sociodemographics stratified according to diabetes type can be viewed in *eTable 1*.

The main analysis of the primary outcome included mean change 6 months post intervention (Delta t_1-t_0). The secondary analyses include mean changes and estimated effects at both 6 months (Delta t_1-t_0) and 12 months (Delta t_2-t_0). *Tables 3a and 3b* provide a detailed overview of group differences (between-subject effects). Changes over time (within-subject effects) can be found in *eTable 2*.

Primary analysis: HbA1c at t_1

In the primary analysis, HbA1c differences between t_0 and t_1 differed statistically significantly and clinically relevantly from each other between IG ($M = -0.36$ percentage points [SD = 1.06]) and CG ($M = 0.16$ percentage points [SD = 1.16]) with a group difference of -0.53 percentage points (95% confidence interval: $[-0.89; -0.16]$, $p = 0.005$).

Likewise in the sensitivity analysis of the ITT population, the reduction in HbA1c in the IG was significantly greater compared to the CG. The mean difference in Delta t_1-t_0 HbA1c values between IG and CG was -0.42 percentage points ($[0.72; -0.12]$, $p = 0.006$).

Secondary analyses

With a mean change of -0.48 percentage points in HbA1c, the comparison between the IG and the CG at t_1 showed a relevant difference in the point estimators in favor of the IG; however, this difference was no longer evident in the further time course from t_0 to t_2 . Since linear mixed models with adjustments were used in the secondary analyses, slight differences emerge in the mean change in HbA1c at t_1 (-0.48 percentage points) compared with the primary analysis (-0.53 percentage points).

For PAID, a relevant difference in point estimators was found in favor of the IG at both measuring time points. At t_1 , the mean PAID change between IG and CG was -5.25 points, and at t_2 -5.35 points.

While there was no relevant difference in point estimators regarding depression (HADS-D) in the comparison between the IG and the KG at t_1 , a relevant difference was found in favor of the IG (1.25 points) at 12-month follow-up at t_2 . The converse was true for the mean difference in BMI: here, with -0.71

TABLE 3a

Primary analysis: differences between IG and CG (between-subject effects)*

	M (SD)	M (SD)	Group difference [95% CI]	p-Value
HbA1c (IG: $n = 69$; CG: $n = 74$)				
t_0	8.84 (1.15)	8.61 (1.09)	Delta t_1-t_0 : $-0.53 [-0.89; -0.16]$	0.005
t_1	8.48 (1.34)	8.78 (1.54)		

* t-Test for independent groups

IG, intervention group; CG, control group; CI, confidence interval; M, mean; SD, standard deviation

BMI points at t_1 , a difference in point estimators was found in favor of the IG, but this was no longer evident at t_2 .

For PHQ-9, HADS-A, SF-36, and triglyceride levels, a comparison of IG and CG revealed no relevant difference in point estimators at either of the measurement time points.

Discussion

The results on the primary endpoint HbA1c show that individuals with diabetes who had elevated blood sugar levels (HbA1c $\geq 7.5\%$) and diabetes distress in a specialized diabetology practice were able to achieve clinically relevant improvements in glycemic control through the low-threshold, cross-sector psychodynamically oriented short-term therapy program psy-PAD compared with optimized standard care. With a mean change of -0.53 percentage points in the 6-month mental health follow-up, there was a statistically significant ($p = 0.005$) and clinically relevant intergroup difference. Secondary analyses also looked at 12-month mental health follow-up. However, with a mean change in HbA1c of -0.29 percentage points, there were no differences in the point estimators. In this context, the effect at 1 year is also very close to the relevance threshold of 0.3 percentage points used by the European Medicines Agency (EMA) to assess a clinically relevant group difference (26). The fact that, despite this, no relevant difference in the point estimators could be achieved may be explained by the fact that sample size determination was primarily geared towards the comparison of HbA1c in the IG and the KG from t_0 to t_1 . Although the power for this comparison was sufficient despite the slightly lower number of cases ($N = 143$ instead of $N = 150$), it is possible that, at times, this was insufficient to show the t_0-t_2 effect for HbA1c as well as secondary outcomes due to the lower number of cases at t_2 .

A significant overall reduction in diabetes distress was seen over the course of the study, thereby making it possible to address one of the therapeutic goals of diabetes treatment. In the group comparison, the

TABLE 3b

Secondary analyses: differences between the IG and CG (between-subject effects)*

	M (SD)	M (SD)	Estimated effects IG–CG (between-subject effects) Estimate [95% CI]
HbA1c (IG: n = 69/69/66; CG: n = 74/74/65)			
t ₀	8.84 (1.15)	8.61 (1.09)	Delta t ₁ –t ₀ : –0.48 [–0.85; –0.12]
t ₁	8.48 (1.34)	8.78 (1.54)	
t ₂	8.52 (1.63)	8.61 (1.65)	Delta t ₂ –t ₀ : –0.29 [–0.77; 0.20]
PAID (IG: n = 69/69/66; CG: n = 74/72/64)			
t ₀	41.59 (18.23)	39.04 (19.02)	Delta t ₁ –t ₀ : –5.25 [–9.74; –0.77]
t ₁	30.54 (20.03)	34.31 (19.17)	
t ₂	29.70 (18.71)	33.42 (19.77)	Delta t ₂ –t ₀ : –5.35 [–10.26; –0.45]
PHQ-9 (IG: n = 69/69/66; CG: n = 74/72/65)			
t ₀	9.86 (5.11)	9.84 (4.76)	Delta t ₁ –t ₀ : –0.86 [–2.19; 0.47]
t ₁	7.80 (4.92)	8.68 (5.07)	
t ₂	7.11 (4.54)	8.60 (5.61)	Delta t ₂ –t ₀ : –1.24 [–2.67; 0.18]
HADS: depression (IG: n = 69/69/66; CG: n = 74/72/65)			
t ₀	7.38 (4.55)	7.08 (4.25)	Delta t ₁ –t ₀ : –0.92 [–2.02; 0.19]
t ₁	6.28 (4.26)	7.04 (4.85)	
t ₂	5.63 (3.92)	6.99 (4.75)	Delta t ₂ –t ₀ : –1.25 [–2.48; –0.02]
HADS: anxiety (IG: n = 69/69/66; CG: n = 74/72/65)			
t ₀	7.32 (3.94)	7.27 (3.71)	Delta t ₁ –t ₀ : –0.56 [–1.48; 0.35]
t ₁	6.17 (3.83)	6.79 (3.87)	
t ₂	6.29 (3.70)	7.05 (4.40)	Delta t ₂ –t ₀ : –0.79 [–1.97; 0.40]
SF-36: total (IG: n = 69/69/65; CG: n = 74/72/65)			
t ₀	55.39 (18.70)	55.57 (18.57)	Delta t ₁ –t ₀ : 1.12 [–4.11; 6.34]
t ₁	61.09 (18.24)	59.79 (21.58)	
t ₂	63.33 (19.04)	57.97 (23.76)	Delta t ₂ –t ₀ : 3.47 [–2.65; 9.58]
SF-36: mental health (IG: n = 69/69/65; CG: n = 74/72/65)			
t ₀	38.18 (12.59)	38.37 (10.89)	Delta t ₁ –t ₀ : 2.67 [–0.83; 6.18]
t ₁	43.37 (11.87)	40.77 (12.95)	
t ₂	45.24 (12.07)	41.47 (12.80)	Delta t ₂ –t ₀ : 3.67 [–0.01; 7.36]
SF-36: physical health (IG: n = 69/69/65; CG: n = 74/72/65)			
t ₀	44.30 (9.28)	44.45 (11.18)	Delta t ₁ –t ₀ : –0.96 [–3.34; 1.41]
t ₁	44.26 (9.52)	45.14 (10.77)	
t ₂	43.97 (9.45)	43.42 (11.78)	Delta t ₂ –t ₀ : –0.62 [–3.44; 2.21]
BMI (IG: n = 66/57/59; CG: n = 72/54/52)			
t ₀	34.16 (7.94)	32.95 (8.27)	Delta t ₁ –t ₀ : –0.71 [–1.36; –0.06]
t ₁	33.07 (8.13)	32.35 (8.33)	
t ₂	33.56 (8.21)	32.90 (8.17)	Delta t ₂ –t ₀ : –0.12 [–0.83; 0.58]
	GM (SDF)	GM (SDF)	Estimate [95% CI]
log-triglycerides (IG: n = 69/69/67; CG: n = 74/74/65)			
t ₀	138.42 (1.99)	131.22 (2.00)	Delta t ₁ –t ₀ : 0.95 [0.83; 1.09]
t ₁	134.92 (1.92)	135.50 (2.07)	
t ₂	137.15 (2.19)	136.85 (1.95)	Delta t ₂ –t ₀ : 1.02 [0.87; 1.20]

* Linear mixed models with adjustment for baseline values at t₀ and for dependencies due to repeated measures in both groups; BMI, body mass index; CI, confidence interval; M, mean; SD, standard deviation Instruments: PAID (diabetes-related distress), HADS-D and PHQ-9 (depression), HADS-A (anxiety), and SF-36 (health-related quality of life)

reduction was greater in the IG both at 6 months and at 12 months post intervention than under optimized standard care. In addition, the 12-month mental health follow-up revealed a difference with regard to depressive symptoms. This effect was seen even though the intervention was deliberately designed in such as way as to not primarily address depressive symptoms, but instead to focus on diabetes distress and its causes. Thus, the results also provide an indication that depressive symptoms in patients with diabetes are closely linked to diabetes distress. For anxiety, on the other hand, there were no group differences, even though a significant reduction was seen in the IG at both measurement time points. Despite the fact that in the absence of a passive control group (i.e., standard care) it is not possible to make any statements about the effect of an additional psychosomatic outpatient consultation and how the further standard care in the specialized practice would have been affected without such an option, it is reasonable to assume that even a low-threshold option such as a psychosomatic outpatient consultation in the context of dedicated psychotherapeutic consultation hours can be helpful for patients. This is also evident in the fact that there was significant improvement in mental health in the two groups at both the 6-month and 12-month mental health follow-ups.

Neither of the study conditions appeared to have an effect on physical health or triglyceride levels. For BMI, on the other hand, the group comparison showed a medium-term reduction in favor of the IG, but this was no longer evident at 12 months. Thus, overall, it cannot be assumed that offering short-term therapy leads to long-term somatic improvements.

Limitations

As a result of study drop-outs, it is not possible to exclude bias. Drop-out analyses showed that the study population (N = 143) had higher scores for weight and physical health-related quality of life and lower scores for depression compared with dropouts between t₀ and t₁ (N = 34). Moreover, patients that dropped out before t₁ were more likely to be married or widowed and less likely to suffer from a panic disorder or a depressive disorder. There were no differences with regard to the primary outcome HbA1c. Secondary sensitivity analysis of the ITT population regarding the primary outcome HbA1c at t₁ verified the result of the primary analysis. A multiple imputation analysis was not performed since the LOCF analysis revealed no evidence of drop-out bias in the results. The psy-PAD study addressed a highly distressed patient population in specialized practices, meaning that it is not possible to readily extrapolate the results to patients in, for example, primary care or with less pronounced symptoms. Moreover, psy-PAD was a cooperation model between diabetology practices and psychosomatic outpatient departments in the Gießen/Marburg/Wetzlar area. An assessment needs to be made as to whether the regional networks and collaborations could similarly be

transferred to other regions in Germany, especially rural areas. Furthermore, it should be noted that a comparison was carried out with an active control group that also received a psychosomatic intervention in the form of one consultation. This means that the results are at times more conservative than would have been the case if they had been compared with conventional routine care, which includes virtually no psychosomatic treatment components. In addition, there is no knowledge regarding which other, for example psychotherapeutic, services were used during the study period.

Conclusion

The psy-PAD study showed that an integrated, cross-sectoral, psychodynamically oriented therapy program in people with diabetes and problematic glycemic control as well as increased diabetes distress can achieve a clinically meaningful and statistically significant reduction in HbA1c in the medium term. In addition, the group comparison demonstrated a reduction in diabetes-related distress and depressive symptoms. Future research should investigate the possibilities (medical, psychosocial, and economic) of further networking specialized diabetology practices and psychosomatic outpatient departments to improve care and evaluate the potential of low-threshold psychotherapeutic/psychosomatic programs.

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Registration

The study was approved by the Ethics Committee of the Justus Liebig University Gießen (Ref. No.: 163/09) and registered with the German Register of Clinical Trials (DRKS): DRKS00003247.

Data sharing statement

Individual, anonymized patient data on which the results of the present article are based will be made available to researchers submitting a methodologically sound analysis proposal. Analysis proposals can be submitted up to 36 months following publication of the article via the contact details for the first author.

Conflict of interest statement

The authors declare that no conflict of interests exists.

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► Supplementary material

eReferences eMethods Sections, eTables:
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CLINICAL SNAPSHOT

Epigastric Mass—a 4-Year-Old With Trichobezoar and Anemia

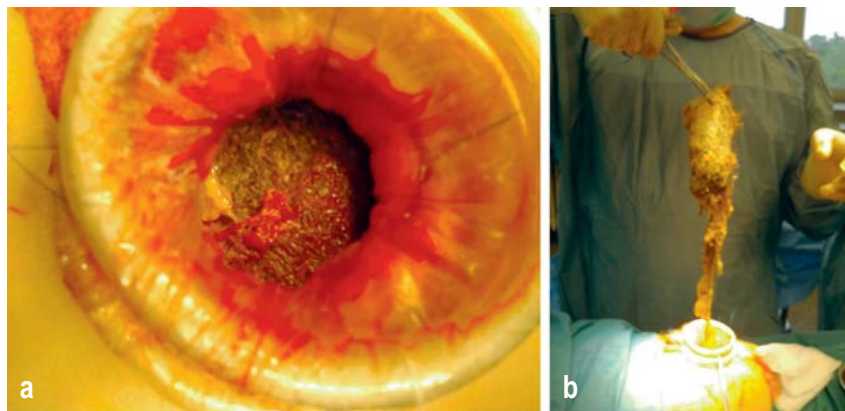


Figure: a) The intra-gastric foreign body is visualized. b) Extraction of the trichobezoar.

Pica syndrome is characterized by an appetite for non-nutritive substances. The accumulation of ingested, non-digestible hair in the stomach as a result of trichophagia is called trichobezoar, while the disorder is referred to as Rapunzel syndrome after the character in the fairy tale. We report the case of a 4-year-old girl with Pica syndrome and iron deficiency (hemoglobin 6.5 g/dL), in whom an extensive gastroduodenal trichobezoar caused a painful upper abdominal mass. Endoscopy revealed a tightly woven ball of hair that was filling the stomach and which required open surgical removal due to its size and nature. The further course was uncomplicated, and contact with a child psychiatrist was initiated. Compulsive hair-pulling (trichotillomania) was evidently the triggering factor. According to the literature, a trichobezoar can cause a pressure-induced gastric ulcer and anemia. Given that our patient's gastric mucosa was normal, we assume that the anemia developed secondary to the malnutrition/malabsorption caused by the gastroduodenal trichobezoar. In summary, the concurrence of an upper abdominal mass and iron deficiency in childhood, and particularly in female adolescents and young adults, should prompt consideration of a trichobezoar in the differential diagnosis.

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Supplementary material to:

An Integrated Psychosomatic Treatment Program for People with Diabetes (psy-PAD)

Results of a Randomized Controlled Trial

by Hanna Kampling^{*1}, Birgit Köhler^{*1}, Isabell Germerott, Burkhard Haastert, Andrea Icks, Bernd Kulzer, Bettina Nowotny, Norbert Hermanns, and Johannes Kruse

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eTABLE 1

Sociodemographic data at t₀ broken down according to diabetes type

	Type 1 diabetes			Type 2 diabetes		
	Total (n = 68)	IG (n = 31)	CG (n = 37)	Total (n = 75)	IG (n = 38)	CG (n = 37)
Sex n (%)						
– Females	49 (72.1)	24 (77.4)	25 (67.6)	43 (57.3)	19 (50.0)	24 (64.9)
– Males	19 (27.9)	7 (22.6)	12 (32.4)	32 (42.7)	19 (50.0)	13 (35.1)
Age M (SD)						
– In years	41.6 (10.6)	44.0 (11.4)	39.6 (9.7)	53.8 (9.5)	53.8 (9.9)	53.7 (9.3)
Marital status n (%)						
– Single	13 (19.1)	6 (19.4)	7 (18.9)	12 (16.0)	6 (15.8)	6 (16.2)
– Married/living in a partnership	47 (69.1)	21 (67.7)	26 (70.3)	51 (68.0)	28 (73.7)	23 (62.2)
– Divorced/separated/widowed	8 (11.8)	4 (12.9)	4 (10.8)	12 (16.0)	4 (10.5)	8 (21.6)
Highest school-leaving qualification n (%)						
– Lower secondary school or elementary school-leaving certificate	13 (19.1)	6 (19.4)	7 (18.9)	30 (40.0)	17 (44.7)	13 (35.1)
– Secondary school certificate/polytechnic high school	25 (36.8)	13 (41.9)	12 (32.4)	20 (26.6)	10 (26.3)	10 (27.0)
– (Subject-specific) university entrance qualification/general university entrance qualification	29 (42.7)	11 (35.5)	18 (48.6)	22 (29.3)	9 (23.7)	13 (35.1)
– Other	1 (1.5)	1 (3.2)	0 (0.0)	3 (4.0)	2 (5.3)	1 (2.7)
Occupational activity in the preceding 6 months n (%)						
– Employed full-time	25 (36.8)	12 (38.7)	13 (35.1)	29 (38.7)	16 (42.1)	13 (35.1)
– Employed part-time	22 (32.4)	12 (38.7)	10 (27.0)	11 (14.7)	5 (13.2)	6 (16.2)
– Unemployed	2 (2.9)	0 (0.0)	2 (5.4)	4 (5.3)	2 (5.3)	2 (5.4)
– Unable to work	3 (4.4)	1 (3.2)	2 (5.4)	3 (4.0)	2 (5.3)	1 (2.7)
– Pension/retirement/early retirement	4 (5.9)	2 (6.5)	2 (5.4)	24 (32.0)	10 (26.3)	14 (37.8)
– Other activity	12 (17.6)	4 (12.9)	8 (21.6)	4 (5.3)	3 (7.9)	1 (2.7)
Incapacity for work in the preceding 6 months n (%)						
– Yes	39 (57.4)	22 (71.0)	17 (45.9)	30 (40.0)	14 (36.8)	16 (43.2)
Duration of incapacity to work^{*1} M (SD)						
– In days	35.3 (64.9)	48.8 (82.1)	17.9 (24.2)	35.6 (50.0)	44.6 (50.2)	27.8 (50.1)
– Quartiles (Q1/median/Q3)	5.0/12.0/35.0	7.0/18.0/56.0	4.0/6.0/21.0	7.0/15.5/40.0	14.0/23.0/50.0	5.0/13.5/26.5
Time since diabetes diagnosis M (SD)						
– In years	20.3 (10.7)	18.6 (10.5)	21.8 (10.9)	12.2 (9.0)	12.5 (9.8)	1.0 (8.2)
– Quartiles (Q1/median/Q3)	12.5/21.0/28.0	12.0/16.0/28.0	13.0/24.0/29.0	6.0/10.0/17.0	6.0/10.0/19.0	6.0/10.0/16.0
Glucose metabolism regulation M (SD)						
– HbA1c	8.6 (1.0)	8.8 (1.2)	8.4 (0.8)	8.8 (1.2)	8.9 (1.2)	8.8 (1.3)
Concomitant diseases and complications^{*2} n (%)						
– Nephropathy	12 (18.8)	4 (14.3)	8 (22.2)	15 (20.0)	9 (23.7)	6 (16.2)
– Retinopathy	22 (34.4)	7 (25.0)	15 (41.7)	15 (20.0)	9 (23.7)	6 (16.2)
– Neuropathy	20 (31.3)	8 (28.6)	12 (33.3)	38 (50.7)	18 (47.4)	20 (54.1)
– Diabetic foot syndrome/amputation on the feet	3 (4.7)	1 (3.6)	2 (5.6)	13 (17.3)	7 (18.4)	6 (16.2)
– Cardiovascular diseases	8 (12.5)	3 (10.8)	5 (14.0)	16 (21.3)	7 (18.4)	9 (24.3)
– Stroke	0 (0.0)	0 (0.0)	0 (0.0)	2 (2.7)	1 (2.6)	1 (2.7)
– Other diseases	50 (78.1)	23 (82.1)	27 (75.0)	66 (88.0)	33 (86.8)	33 (89.2)
Inpatient treatment in the preceding 6 months^{*3} n (%)						
– Yes	13 (19.1)	6 (19.4)	7 (18.9)	17 (23.0)	7 (18.4)	10 (27.8)

^{*1}In relation to participants unable to work in the preceding 6 months

^{*2}n = 3 Missing in the IG and n = 1 missing in the CG

^{*3}n = 1 Missing in the CG

IG, intervention group; CG, control group; M, mean; SD, standard deviation

eTABLE 2

Secondary analyses*: differences within the IG and CG (within-subject effects)

	M (SD)	M (SD)	Mean changes t_x-t_0 (within-subject effects) Estimate [95% CI]
HbA1c (IG: n = 69/69/66; CG: n = 74/74/65)			
t_0	8.84 (1.15)	8.61 (1.09)	Delta t_1-t_0 : IG: -0.33 [-0.60; -0.07] Delta t_1-t_0 : CG: 0.15 [-0.11; 0.40]
t_1	8.48 (1.34)	8.78 (1.54)	
t_2	8.52 (1.63)	8.61 (1.65)	Delta t_2-t_0 : IG: -0.31 [-0.65; 0.03] Delta t_2-t_0 : CG: -0.02 [-0.37; 0.32]
PAID (IG: n = 69/69/66; CG: n = 74/72/64)			
t_0	41.59 (18.23)	39.04 (19.02)	Delta t_1-t_0 : IG: -10.63 [-13.84; -7.42] Delta t_1-t_0 : CG: -5.38 [-8.51; -2.24]
t_1	30.54 (20.03)	34.31 (19.17)	
t_2	29.70 (18.71)	33.42 (19.77)	Delta t_2-t_0 : IG: -11.53 [-14.99; -8.07] Delta t_2-t_0 : CG: -6.18 [-9.65; -2.70]
PHQ-9 (IG: n = 69/69/66; CG: n = 74/72/65)			
t_0	9.86 (5.11)	9.84 (4.76)	Delta t_1-t_0 : IG: -2.04 [-2.99; -1.09] Delta t_1-t_0 : CG: -1.18 [-2.11; -0.24]
t_1	7.80 (4.92)	8.68 (5.07)	
t_2	7.11 (4.54)	8.60 (5.61)	Delta t_2-t_0 : IG: -2.54 [-3.55; -1.53] Delta t_2-t_0 : CG: -1.30 [-2.31; -0.29]
HADS: depression (IG: n = 69/69/66; CG: n = 74/72/65)			
t_0	7.38 (4.55)	7.08 (4.25)	Delta t_1-t_0 : IG: -1.04 [-1.83; -0.25] Delta t_1-t_0 : CG: -0.13 [-0.90; 0.64]
t_1	6.28 (4.26)	7.04 (4.85)	
t_2	5.63 (3.92)	6.99 (4.75)	Delta t_2-t_0 : IG: -1.49 [-2.36; -0.62] Delta t_2-t_0 : CG: -0.24 [-1.11; 0.64]
HADS: anxiety (IG: n = 69/69/66; CG: n = 74/72/65)			
t_0	7.32 (3.94)	7.27 (3.71)	Delta t_1-t_0 : IG: -1.14 [-1.79; -0.49] Delta t_1-t_0 : CG: -0.58 [-1.22; 0.06]
t_1	6.17 (3.83)	6.79 (3.87)	
t_2	6.29 (3.70)	7.05 (4.40)	Delta t_2-t_0 : IG: -1.04 [-1.88; -0.21] Delta t_2-t_0 : CG: -0.26 [-1.09; 0.58]
SF-36: total (IG: n = 69/69/65; CG: n = 74/72/65)			
t_0	55.39 (18.70)	55.57 (18.57)	Delta t_1-t_0 : IG: 5.50 [1.76; 9.23] Delta t_1-t_0 : CG: 4.38 [0.72; 8.04]
t_1	61.09 (18.24)	59.79 (21.58)	
t_2	63.33 (19.04)	57.97 (23.76)	Delta t_2-t_0 : IG: 6.81 [2.48; 11.13] Delta t_2-t_0 : CG: 3.34 [-0.98; 7.66]
SF-36: mental health (IG: n = 69/69/65; CG: n = 74/72/65)			
t_0	38.18 (12.59)	38.37 (10.89)	Delta t_1-t_0 : IG: 5.27 [2.76; 7.77] Delta t_1-t_0 : CG: 2.59 [0.14; 5.05]
t_1	43.37 (11.87)	40.77 (12.95)	
t_2	45.24 (12.07)	41.47 (12.80)	Delta t_2-t_0 : IG: 6.82 [4.21; 9.44] Delta t_2-t_0 : CG: 3.15 [0.55; 5.75]

SF-36: physical health (IG: n = 69/69/65; CG: n = 74/72/65)			
t ₀	44.30 (9.28)	44.45 (11.18)	Delta t ₁ -t ₀ : IG: 0.05 [-1.64; 1.75] Delta t ₁ -t ₀ : CG: 1.02 [-0.64; 2.68]
t ₁	44.26 (9.52)	45.14 (10.77)	
t ₂	43.97 (9.45)	43.42 (11.78)	Delta t ₂ -t ₀ : IG: -0.60 [-2.61; 1.40] Delta t ₂ -t ₀ : CG: 0.01 [-1.98; 2.01]
BMI (IG: n = 66/57/59; CG: n = 72/54/52)			
t ₀	34.16 (7.94)	32.95 (8.27)	Delta t ₁ -t ₀ : IG: -0.75 [-1.22; -0.29] Delta t ₁ -t ₀ : CG: 0.04 [-0.50; 0.41]
t ₁	33.07 (8.13)	32.35 (8.33)	
t ₂	33.56 (8.21)	32.90 (8.17)	Delta t ₂ -t ₀ : IG: -0.51 [-1.00; -0.02] Delta t ₂ -t ₀ : CG: -0.39 [-0.90; 0.12]
	GM (SDF)	GM (SDF)	Estimate [95% CI]
log-triglycerides (IG: n = 69/69/67; CG: n = 74/74/65)			
t ₀	138.42 (1.99)	131.22 (2.00)	Delta t ₁ -t ₀ : IG: 0.98 [0.89; 1.08] Delta t ₁ -t ₀ : CG: 1.03 [0.94; 1.13]
t ₁	134.92 (1.92)	135.50 (2.07)	
t ₂	137.15 (2.19)	136.85 (1.95)	Delta t ₂ -t ₀ : IG: 0.99 [0.88; 1.11] Delta t ₂ -t ₀ : CG: 0.97 [0.86; 1.09]

* Linear mixed models with adjustment for baseline values at t₀ and for dependencies due to repeated measures in both groups; for more details see *eMethods Section 2*.

BMI, body mass index; GM, geometric mean; IG, intervention group; CG, control group; CI, confidence interval; M, mean; SD, standard deviation; SDF, standard deviation factors; instruments: PAID (diabetes-related emotional distress), HADS-D and PHQ-9 (depression), HADS-A (anxiety); SF-36 (health-related quality of life)

Secondary analyses: HbA1c

For HbA1c at t₁, a relevant difference in point estimators was seen only in the IG (-0.33 %, 95% CI: [-0.60; -0.07]), not in the CG. When comparing t₂ to t₀, the within-subject effect was still clinically relevant, but differences in point estimators were no longer visible for either group.

Secondary analyses: diabetes-related distress (PAID)

For the PAID, relevant differences in point estimators were found for both groups and at both measurement time points (IG t₁: -10.63 [-13.84; -7.42]; CG t₁: -5.38 [-8.51; -2.24]; IG t₂: -11.53 [-14.99; -8.07]; CG t₂: -6.18 [-9.65; -2.70]).

Secondary analyses: psychological distress (PHQ-9, HADS)

For depression (HADS-D), relevant differences in point estimators were seen in the IG at both measurement time points (t₁: -1.04 [-1.83; -0.25]; t₂: -1.49 [-2.36; -0.62]), but not in the CG. In the PHQ-9, on the other hand, relevant differences in point estimators were seen in both groups and at both measurement time points (IG t₁: -2.04 [-2.99; -1.09]; CG t₁: -1.18 [-2.11; -0.24]; IG t₂: -2.54 [-3.55; -1.53]; CG t₂: -1.30 [-2.31; -0.29]).

For anxiety, the HADS-A revealed relevant differences in point estimators in the IG at both measurement time points (t₁: -1.14 [-1.79; -0.49]; t₂: -1.04 [-1.88; -0.21]). As with the HADS-D, no relevant difference in point estimators could be seen for the HADS-A in the CG.

Secondary analyses: health-related quality of life (SF-36)

For mental health as determined using SF-36, relevant differences in point estimators were seen in the total score in both groups at t₁ (IG: 5.50 [1.76; 9.23]; CG: 4.38 [0.72; 8.04]). At t₂, relevant differences in point estimators were seen only in the IG (IG: 6.81 [2.48; 11.13]).

For mental health, relevant differences in point estimators were seen in both groups and at both measurement time points (IG t₁: 5.27 [2.76; 7.77]; CG t₁: 2.59 [0.14; 5.05]; IG t₂: 6.82 [4.21; 9.44]; CG t₂: 3.15 [0.55; 5.75]).

With regard to physical health, no relevant differences in point estimators were seen for either group or at any measurement time point.

Secondary analyses: BMI

With regard to BMI, relevant differences in point estimators were seen at both measurement time points only in the IG (t₁: -0.75 [-1.22; -0.29]; t₂: -0.51 [-1.00; -0.02]), not in the CG.

Secondary analyses: log-triglycerides

For log-triglycerides, no relevant differences in point estimators were seen in either group or at any measurement time point.

eMETHODS SECTION 1

Description of the psy-PAD intervention

Content orientation and aims of the psy-PAD intervention

(see also [e1])

The psy-PAD intervention is based on a low-threshold psychodynamically oriented short-term therapy program that integrates elements from self-management therapy and solution-oriented psychotherapy. In order to be able to integrate the intervention into diabetes treatment, regular consultations took place between the diabetologists treating the patients in the specialized practices and the staff of the psychosomatic outpatient clinics. The integration of the latter also facilitated, among other things and when necessary, access to further psychosomatic care.

The aim of psy-PAD is to achieve a reduction in psychosocial treatment impediments and diabetes-related emotional distress and, as a result, improve metabolic control in patients with diabetes.

Structure

psy-PAD comprised eight individual sessions, which were initially held weekly (4 ×) and later monthly (4 ×). Overall, the intervention was divided into four phases:

Phase 1 focuses on establishing a viable therapeutic relationship, identifying individual psychosocial impediments to treatment, communicating diabetes-related and psychological interrelationships to achieve a comprehensive understanding of the disease, and taking the patient's biographical history. The latter should help in understanding the patients' structural level and internalized conflicts and in learning to classify accompanying difficulties in dealing with diabetes. Based on the diagnosis, current disease status, and critical disease phases, both illness behavior and treatment behavior, previous coping strategies and their associated affects, as well as psychological symptoms are explored. At the same time, the patient is asked about their resources (for example, social network, occupational stability), as are diabetes-related interactions with family members and current reference persons.

Phase 2 primarily comprises determining specific and diabetes-relevant treatment goals that can be achieved during the sessions. These include, for example, integrating more self-care or exercise sessions into daily life or having conversations with relatives about their disease and how to deal with it. Furthermore, treatment options are discussed regarding other diabetes-related goals that cannot be achieved during therapy, as well as possible comorbid mental disorders. Goals are also set in terms of therapy, such as building up motivation to start or make arrangements for outpatient or inpatient psychotherapy or psychosomatic rehabilitation measures. As part of a participative decision-making process, achievable treatment goals are defined against the background of the individual problem situation and the available personal resources, with particular attention to psychosocial treatment impediments and the current phase of motivation to change (e2). If it becomes apparent during the session that a patient is markedly ambivalent toward the required behavioral changes, the goals should be modified and, in a first step, an understanding of this ambivalence developed. During the therapy session, the therapist adopts an attitude that is understanding of the difficulties in implementing behavioral changes that are a normal part of the process of further development and which follow an internal logic.

Phase 3 is characterized by its orientation toward resource activation and self-management (e3). Since the psychosocial impediments to treatment, the psychological symptoms, and the therapeutic goals derived from these are highly heterogeneous in these patients, different

intervention elements are operationalized based on the elements of psychodynamic psychotherapy (e3), which are used according to the individual needs of each patient.

Phase 4 concentrates on working together with the patient to identify possible ways to maintain the improvements that have been achieved. In addition, further therapy options are recommended and, if necessary, appropriate measures initiated.

Detailed description of the treatment modules

Building an understanding of the difficulty of behavior modification

This intervention element is aimed at patients who, as a result of repeated unsuccessful attempts to implement the behavioral changes necessary for diabetes management (for example, weight reduction), experience shame and guilt and become increasingly withdrawn. The affected patients are supported by the therapist to develop an understanding of the difficulties involved in change and to adopt an observing and non-judgmental attitude toward their own actions. Through empathetic inquiring on the part of the therapist, the patient is freed up to temper their harsh treatment of themselves and to understand their difficulties not in terms of “fault” or “guilt.” Furthermore, a way is elaborated together with the patient as to how they can implement a desire for change in appropriate steps. If, by working through the implementation difficulties, it becomes clear that there is a link to an interactional problem, the patient can be provided with initial explanations of this as part of the short-term therapy, and, if necessary, the initiation of psychotherapeutic treatment is recommended and arrangements made.

Strengthening self-esteem and integrating the disease into the patient’s self-image

Many patients with diabetes find the change in self-perception due to their chronic physical disease very challenging, which can lead to problems in accepting and coping with the disease. Since the self-esteem of these patients is often linked to an ideal of strength and health, patients with this problem desire recognition and affection and fear being devalued as sick people. Therefore, they often demonstratively exhibit strength and health and disregard medical advice in order not to be different to their healthy counterparts. Patients often react to possible subsequent reproaches from their physician and more checks by further neglecting their disease—thus leading to poorer blood sugar regulation—in order to avoid having to experience the reduced self-esteem and shame. Therefore, the aim of this therapy element is to help the patient understand their own behavior in the context of self-limiting beliefs, put these into perspective, and, if necessary, attribute them to biographical experiences. Integrating the disease into the patient’s self-image is also accompanied by an active consideration of the tension between the patient’s own wishes and needs on the one hand and the requirements imposed by diabetes therapy on the other.

Work on affect perception, affect differentiation, and affect expression

This module is aimed at patients who have difficulty openly expressing the affects, symptoms, and limitations associated with their disease. This problem is often linked to early biographical experiences, which can be associated with interpersonal difficulties, for example in a partnership or in the family. As a result, messages in interpersonal relationships that cannot be expressed in other ways, for example, anger, disappointment, or irritation, as well as desires for solicitude and autonomy, are “regulated” by difficult-to-control diabetes. The aim of this treatment module is to help patients better perceive their own diabetes-related affects, to express them free from fear, and, if necessary, to understand them through the prism of

situations of tension in interpersonal relationships. It is made clear to affected patients that their needs and difficulties are seen and heard and that they can unburden themselves through the discussions.

Clarifying how to deal with restrictions on autonomy

Coming to terms with diabetes often (re-)activates an individuation–dependency conflict, since treatment-related restrictions on the individual degree of freedom often conflict with the individual's desire to make autonomous choices in life. This inner conflict may express itself, for example, in highly irregular blood sugar measurements and “injecting according to gut feel.” As a result, the treating diabetologist recommends more frequent blood sugar monitoring and regular insulin administration, which often worsens the willingness of the affected person to change. Therefore, this element of treatment aims to respond to patients' desires for independence in an understanding and accepting manner, while at the same time working with them on the extent to which they would like to see changes in the way they deal with their disease and how, where necessary, this can be worked on together.

Problem-solving training

If it is agreed upon that the goal of therapy is to improve specific, individual diabetes-related stress and conflict situations, patients are helped to develop new perspectives and creatively formulate possible new solutions for problematic situations by means of multi-stage problem-solving training. Through this, the affected patients should implicitly acquire a general problem-solving attitude that enables them to additionally apply the problem-solving strategies they have developed to other, possibly diabetes-independent problem areas.

Building-up regenerative resources

If a patient wishes to improve their regenerative activities (also generally in the sense of resource activation), individual ways of balancing out stress are elaborated using a variety of elements from enjoyment training. In this process, previous ways of relieving stress that the affected patients may have neglected can be picked up again and incorporated in everyday life. At the same time, patients are helped to better pick up on signals telling them that they need to recuperate. Patients are taught exercises to promote enjoyment in everyday life and are encouraged to include enjoyable experiences in their daily routine. Having said that, these regenerative activities should not be misconstrued as additional requirements, but should be seen as opportunities for enjoyment and fun.

Strengthening social resources

If the goal of therapy is to improve social contacts and social support, patients are helped as part of psychodynamic and empowerment-oriented interventions to reflect on their current social network and, where necessary, strengthen their support contacts or develop new support contacts. In this context, the diabetes team or diabetes support groups can also be seen as social resources in a broader sense.

eMETHODS SECTION 2

Description and psychometric properties of the measurement instruments used

Problem Areas In Diabetes Scale: PAID

The PAID (e4) is a 20-point questionnaire to measure diabetes distress. The possible answers to each item range from 0 = “not a problem” to 4 = “a serious problem.” The sum value is found by adding up the scores for each item and multiplying this by 1.25, yielding a total score of between 0 and 100. This makes it possible to measure the severity of diabetes distress, with higher scores being associated with greater distress. A score of > 40 indicates severe diabetes-related emotional distress, which can also point to significant depressive symptoms (e4, e5). With a Cronbach’s $\alpha \geq 0.93$ for the scale as a whole, the PAID has good psychometric properties (e6, e7). Data on the minimal clinically important change (MCIC) are not available for the PAID (e8). The short form of the PAID (PAID-1/PAID-5) was used as the screening instrument in patient recruitment (e9).

Patient Health Questionnaire: PHQ-D (short form)

The PHQ-D is a well-validated psychodiagnostic instrument that can be used both in clinical practice and for research questions (e10). Using the short version, it is possible to assess depressive disorders (major depression and other depressive disorders), panic disorder, and psychosocial functioning (e11). The short form of the PHQ-D comprises 15 items (nine on depressive symptoms, five on panic disorder, and one item on psychosocial functioning) and enables the measurement of depression severity. As such, the PHQ-D depression scale corresponds to the established PHQ-9 (Patient Health Questionnaire) (e12). To calculate the total scale score for depressive disorders, the severity scores for the individual items are added up. The score can range from 0 and 27. Scores between 0 and 4 indicate the absence of depression, scores between 5 and 10 indicate mild depression, while 10 points or more indicate major depression.

Hospital Anxiety and Depression Scale: HADS

The HADS (e13, e14) is an instrument to assess anxiety and depression in patients with physical ill health or physical symptoms and is used both in clinical practice and in research. The two subscales of the HADS—HADS-D (depression) and HADS-A (anxiety)—each consist of seven items that ask in a targeted manner about psychological anxiety and symptoms of depression in order to avoid any confounding as a result of somatic comorbidity. The items are answered on a scale between 0 = “only occasionally/never” and 3 = “much of the time.” The severity of symptoms can be quantified using the total score per scale, which ranges from 0–21. Higher scores indicate more severe depression or anxiety, and the cut-off is > 11 points per scale (e15, e16). The total sum score can be used as a measure of general mental health impairment. The HADS scales have good internal reliability with values for Cronbach’s $\alpha = 0.76$ (HADS-D) and $\alpha = 0.80$ (HADS-A) (e17).

Health Survey: SF-36

The SF-36 is a measurement instrument to survey health-related quality of life and covers the basic dimensions of physical and mental health with a total of 36 items (e18, e19). The questionnaire was developed as a disease-specific measurement tool and makes a distinction between: physical ability to function, physical ability to fulfill usual roles, physical pain, general health perceptions, vitality, ability to function socially, emotional ability to fulfill usual roles, and psychological well-being. The total score can be between 0 and 100, with higher scores indicating greater health-related

quality of life. With a Cronbach's α between 0.76 and 0.90 (e20), internal consistency is deemed to be good.

Structured clinical interview for DSM-IV: SCID-I

The SCID (e21, e22) is a structured standardized clinical interview to diagnose mental disorders according to DSM-IV (e23) and is considered the gold standard for the reliable determination of mental disorders. SCID-I is used to identify mental disorders (DSM-IV Axis-I Disorders). The responses given by subjects to the predefined questions are coded by the interviewing clinician as either met or not met; this prompts the clinician to ask further questions in order to make a differentiated diagnosis. SCID-I is made up of 10 modules covering different categories of mental disorders, whereby these modules can also be used independently of one other. For the present study, patients were interviewed solely regarding affective disorders (major depression, bipolar affective disorder, dysthymic disorder [Section A], and adjustment disorder [Section I]). The inter-rater reliability of SCID-I for affective disorders, anxiety disorders, schizophrenia, and alcohol abuse is over $r = 0.70$ (e24). SCID-I takes approximately 30–90 min to administer.

Dementia detection: DemTect

Der DemTect (e25) is an economical five-item screening instrument for use in clinical practice to detect early-stage dementia. The test is administered in the form of an interview, as part of which subjects are set five different tasks relating to the following areas of ability: attention, word recall, word fluency, and cognitive flexibility. Raw scores are transformed using two age-standardized conversion tables (under- and over-60-year-olds). The resulting total score ranges between 0 and 18. Scores between 13 and 18 points indicate appropriate cognitive performance, while scores between 9 and 12 point to mild cognitive impairment. Scores < 8 prompt suspicion of dementia. The results should be independent not only of age-related decline in cognitive function but also of educational level. The DemTect showed good sensitivity, inter-rater reliability ($r = 0.99$), and validity in a number of studies (e26, e27).

eMETHODS SECTION 3

Sample size and power, as well as recruitment, randomization, and blinding

Sample size and power

To calculate the sample size, we assumed that a 0.6% greater reduction in HbA1c as a result of psy-PAD compared to the control group should be revealed by the t-test at 6-month follow-up (t_1) with a power of 80% at a two-tailed 5% significance level. A standard deviation of $\pm 1.3\%$ was assumed for the difference value t_0-t_1 in the intervention and control groups. As such, the required sample size was $N = 150$ patients ($n = 75$ per group). Power was calculated using PROC POWER in SAS Version 9.4. Given an expected drop-out rate of 25% (by t_1), a total of $N = 200$ patients were to be recruited.

Overall, the assumptions of the planned analyses were well fulfilled, meaning that the planned power at t_1 was met. Although the total number of patients recruited overall was lower ($n = 178$) than the planned $N = 200$, the drop-out rate of 19.7% was lower than expected (25%). With a case number of $n = 143$ evaluable subjects in the study population (per protocol), this was only slightly smaller than the number calculated using power analysis ($N = 150$).

Recruitment, randomization, and blinding

Recruitment was carried out in two stages, firstly as:

- Measures by physicians and diabetes advisors at the respective specialized practices to motivate patients, including consent for data transfer to the trial coordinating center (fulfillment of inclusion and exclusion criteria as well as contact data), followed by
- Renewed summoning of patients by psychotherapists in the psychosomatic outpatient department for detailed patient information. Following informed written consent, stratified randomization took place, with patients being individually assigned per specialized practice to one of the two study conditions (psy-PAD versus optimized standard care) by the clinical trial center. To this end, and depending on the a priori targeted case numbers per specialized practice, a 50:50 distribution to the intervention and control conditions was made on paper and placed, concealed, in an urn (one urn per specialized practice). If the recruitment rate was higher than assumed beforehand, the procedure was repeated. At the trial coordinating center, a random draw from the urn of the respective specialized practice was then performed. Assignment results—intervention or control condition—were then reported back to the patients and the respective specialized practices. Assignment to the intervention or control condition was set in motion by the trial coordinating center. As such, following assignment to the intervention or control condition, group assignment based on type of intervention was disclosed, meaning that patients, practitioners, specialized practices, and the trial coordinating center became unblinded.

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ANHANG

Anhang 1 ERKLÄRUNG HABILITATIONSLEISTUNG

ERKLÄRUNG ÜBER DIE EIGENSTÄNDIGE ANFERTIGUNG DER ARBEIT UND KENNTLICHMACHUNG DER BENUTZTEN HILFSMITTEL UND HILFEN

Hiermit erkläre ich, dass ich die vorliegende Arbeit bzw. die mir zuzuordnenden Teile im Rahmen einer kumulativen Habilitationsschrift, selbstständig und ohne unzulässige Hilfe oder Benutzung anderer als der angegebenen Hilfsmittel angefertigt habe. Alle Textstellen, die wörtlich oder sinngemäß aus veröffentlichten oder nichtveröffentlichten Schriften entnommen sind, und alle Angaben, die auf mündlichen Auskünften beruhen, sind als solche kenntlich gemacht. Ich versichere, dass ich für die nach §2 (3) der Habilitationsordnung angeführten bereits veröffentlichten Originalarbeiten als Erst-oder Seniorautor fungiere, da ich den größten Teil der Daten selbst erhoben habe, für das Design der Arbeiten verantwortlich bin und die Manuskripte maßgeblich gestaltet habe. Für alle von mir erwähnten Untersuchungen habe ich die in der „Satzung der Justus-Liebig-Universität zur Sicherung guter wissenschaftlicher Praxis“ niedergelegten Grundsätze befolgt. Ich versichere, dass alle an der Finanzierung der Arbeiten beteiligten Geldgeber in den jeweiligen Publikationen genannt worden sind. Ich versichere außerdem, dass die vorgelegte Arbeit weder im Inland noch im Ausland in gleicher oder ähnlicher Weise einer anderen Prüfungsbehörde vorgelegt wurde oder Gegenstand eines anderen Prüfungsverfahrens war. Mit der Überprüfung meiner Arbeit durch eine Plagiatserkennungssoftware bzw. ein internetbasiertes Softwareprogramm erkläre ich mich einverstanden.

Gießen den 11. Dezember 2023

Dr. phil. Hanna Kampling

Anhang 2 ABKÜRZUNGSVERZEICHNIS

ACE	Adverse Childhood Experiences
BPS	Borderline Persönlichkeitsstörungen
CGM	Continuous Glucose Monitoring
DMP	Disease Management Program
DSM	Diagnostic and Statistical Manual of Mental Disorders
ETMCQ	Epistemic Trust, Mistrust and Credulity Questionnaire
ICD	International Classification of Diseases
HPA	Hypothalamic-Pituitary-Adrenal bzw. Hypothalamus-Hypophysen-Nebennierenrinde
kPTBS	Komplexe posttraumatische Belastungsstörung
LPFS	Level of Personality Functioning Scale
MBT	Mentalization-Based-Treatment bzw. Mentalisierungsbasierte Psychotherapie
MZQ	Mentalization Questionnaire
OPD	Operationalisierten Psychodynamische Diagnostik
OPD-SFK	OPD-Strukturfragebogen–Kurzform
PsIA	Psychosomatische Institutsambulanzen
PTBS	Posttraumatische Belastungsstörung
RCT	Randomisierte kontrollierte Studie

Anhang 3 ABBILDUNGSVERZEICHNIS

Abbildung 1:	Biopsychosoziales Modell adaptiert nach Engel 1977 aus (Burch, 2021)	5
Abbildung 2:	Entwicklungsmodell der Assoziationen zwischen Bindung, Mentalisierung und epistemischen Vertrauen adaptiert nach und Kolleg:innen (Bo et al., 2017).....	16
Abbildung 3:	Schematische theoretische Darstellung der direkten Assoziation zwischen belastenden Kindheitserfahrungen und (a) psychischen Belastungen und Störungen sowie (b) chronischen körperlichen Erkrankungen.	21
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Anhang 4 INSTRUMENTE

Anhang 4.1 OPERATIONALISIERTE PSYCHODYNAMISCHE DIAGNOSTIK – STRUKTURFRAGEBOGEN–KURZFORM (OPD-SFK)

Fragebogen zur Selbstbeschreibung

OPD-SFK

Auf der folgenden Seite finden Sie eine Reihe von Aussagen, mit denen verschiedene Eigenschaften von Personen beschrieben werden. Bitte geben Sie an, wie sehr diese Aussagen auf Sie zutreffen. Kreuzen Sie bitte diejenige Antwort an, die im Allgemeinen auf Sie am besten zutrifft. Dabei gibt es keine richtigen oder falschen Antworten, weil jeder Mensch im Erleben anders ist.

		trifft gar nicht zu	trifft eher nicht zu	teils/ teils	trifft eher zu	trifft völlig zu
1.	Ich erlebe mich manchmal wie eine fremde Person.	☐	☐	☐	☐	☐
2.	Wenn ich viel über mich nachdenke, gerate ich eher in Verwirrung.	☐	☐	☐	☐	☐
3.	Wenn man andere zu nahe an sich heran lässt, kann das gefährlich werden.	☐	☐	☐	☐	☐
4.	Ich kann mich anderen oft schwer verständlich machen.	☐	☐	☐	☐	☐
5.	In mir herrscht oft ein solches Gefühlschaos, dass ich es gar nicht beschreiben könnte.	☐	☐	☐	☐	☐
6.	Ich schätze manchmal falsch ein, wie mein Verhalten auf andere wirkt.	☐	☐	☐	☐	☐
7.	Wenn andere viel über mich wissen, fühle ich mich oft irgendwie kontrolliert oder beobachtet.	☐	☐	☐	☐	☐
8.	Meine Gefühle sind manchmal so intensiv, dass ich Angst bekomme.	☐	☐	☐	☐	☐
9.	Ich bin schon sehr verletzt worden, weil ich mich in einem Menschen getäuscht hatte.	☐	☐	☐	☐	☐
10.	Es fällt mir schwer, zu anderen Kontakt aufzunehmen.	☐	☐	☐	☐	☐
11.	Ich habe kein gutes Selbstbewusstsein.	☐	☐	☐	☐	☐
12.	Meine Erfahrung ist: Wenn man Menschen zu sehr vertraut, kann man böse Überraschungen erleben.	☐	☐	☐	☐	☐

Anhang 4.2 MENTALIZATION QUESTIONNAIRE (MZQ)

MZQ

Im Folgenden finden sie einige Aussagen, die sich auf Fähigkeiten beziehen **Gefühle von anderen und von sich wahrzunehmen**. Wir möchten Sie bitten möglichst spontan Ihre Zustimmung zu diesen Aussagen zu kennzeichnen. Hierbei können Sie einer Aussage voll und ganz, oder aber auch überhaupt nicht zustimmen.

	Stimme überhaupt nicht zu	Stimme eher nicht zu	Teils - teils	Stimme weit- gehend zu	Stimme voll und ganz zu
1. Wenn ich erwarte, kritisiert oder verletzt zu werden, nimmt meine Angst immer mehr zu.	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
2. Erklärungen von anderen helfen mir nur wenig dabei, meine Gefühle zu verstehen.	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
3. Gefühle werden für mich manchmal gefährlich.	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
4. Dass mich jemand wirklich gern hat, kann ich nur glauben, wenn es für mich ausreichend reale Beweise (z.B. eine Verabredung, ein kleines Geschenk oder eine Umarmung) dafür gibt.	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
5. Meistens ist es besser, nichts zu fühlen.	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
6. Ich kann meine Gefühle oft nicht kontrollieren.	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
7. Es fällt mir schwer zu glauben, dass Beziehungen sich verändern können.	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
8. Ich neige dazu, Gefühle der körperlichen Anspannung oder des Unbehagens solange nicht wahrzunehmen, bis sie meine ganze Aufmerksamkeit „erzwingen“.	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
9. Über Gefühle zu sprechen würde bedeuten, dass diese immer mächtiger werden.	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
10. Manchmal wird mir erst im Nachhinein bewusst, welche Gefühle ich vorher hatte.	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
11. Es fällt mir häufig schwer, meine Gefühle in ihrer ganzen Intensität wahrzunehmen.	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
12. Ich fühle mich oft von der Vorstellung bedroht, dass mich jemand kritisieren oder verletzen könnte.	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
13. Wenn jemand in meiner Gegenwart gähnt, ist das ein sicheres Zeichen dafür, dass er sich in meiner Gesellschaft langweilt.	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
14. Ich habe meistens keine große Lust, mit anderen über meine Gedanken und Gefühle zu sprechen.	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
15. Oft weiß ich gar nicht, was in mir vorgeht.	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅

**Anhang 4.3 EPISTEMIC TRUST, MISTRUST AND CREDULITY QUESTIONNAIRE
(ETMCQ)**

ETMCQ – Epistemic Trust, Mistrust and Credulity Scale

<i>(Bitte machen Sie in <u>jeder Zeile</u> ein Kreuz.)</i>		starke Ablehnung	Ablehnung	Ein wenig Ablehnung	weder Zustimmung noch Ablehnung	Ein wenig Zustimmung	Zustimmung	starke Zustimmung
		1	2	3	4	5	6	7
01	Ich frage üblicherweise andere um Rat, wenn ich persönliche Probleme habe.	☐	☐	☐	☐	☐	☐	☐
02	Ich finde es leichter, Informationen zu vertrauen und aufzunehmen, wenn sie von jemandem stammen, der mich gut kennt.	☐	☐	☐	☐	☐	☐	☐
03	Ich bevorzuge, Dinge im Internet selbst herauszufinden, statt andere um Informationen zu bitten.	☐	☐	☐	☐	☐	☐	☐
04	Ich befolge normalerweise keinen Ratschlag, den ich von anderen bekomme, selbst wenn ich denke, dass der Rat wahrscheinlich gut ist.	☐	☐	☐	☐	☐	☐	☐
05	In der Vergangenheit habe ich falsch eingeschätzt, wem ich glauben kann, und bin deswegen ausgenutzt worden.	☐	☐	☐	☐	☐	☐	☐
06	Ich habe oft das Gefühl, dass andere nicht verstehen, was ich will und brauche.	☐	☐	☐	☐	☐	☐	☐
07	Ich werde oft für naiv gehalten, weil ich fast alles glaube, was andere mir erzählen.	☐	☐	☐	☐	☐	☐	☐
08	Wenn ich mit verschiedenen Menschen spreche, kann ich mich leicht von dem überzeugen lassen, was sie sagen, auch wenn dies etwas anders ist, als das was ich vorher geglaubt habe.	☐	☐	☐	☐	☐	☐	☐
09	Ein Gespräch mit Menschen, die mich schon lange kennen, kann mir helfen, neue Perspektiven über mich selbst zu entwickeln.	☐	☐	☐	☐	☐	☐	☐

10	Ich finde es sehr nützlich, aus dem zu lernen, was andere mir über ihre Erfahrungen erzählen.	☐	☐	☐	☐	☐	☐	☐
11	Wenn du dem, was andere dir erzählen, zu viel Glauben schenkst, bist du leichter verletzbar.	☐	☐	☐	☐	☐	☐	☐
12	Wenn mir jemand etwas erzählt, frage ich mich sofort, warum er mir das jetzt erzählt.	☐	☐	☐	☐	☐	☐	☐
13	Ich habe zu oft Ratschläge von den falschen Menschen angenommen.	☐	☐	☐	☐	☐	☐	☐
14	Verschiedene Leute haben mir gesagt, dass ich zu leicht von anderen beeinflussbar bin.	☐	☐	☐	☐	☐	☐	☐
15	Wenn ich nicht weiß, was ich tun soll, ist mein erster Impuls, jemanden zu fragen, dessen Meinung ich schätze.	☐	☐	☐	☐	☐	☐	☐