Rheinland-Pfälzische Technische Universität Kaiserslautern Landau

# Welche Kinder und Familien profitieren inwiefern von der Multisystemischen Therapie Kinderschutz?

## Kumulative Dissertation

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vorgelegt von

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## Inhaltsverzeichnis

## Zusammenfassung

Kinder und Jugendliche, die von Misshandlung und/oder Vernachlässigung betroffen sind, haben ein erhöhtes Risiko, psychische Störungen und eine Reihe verschiedener Komorbiditäten zu entwickeln. Die Multisystemische Therapie Kinderschutz (MST-CAN; Multisystemic Therapy for Child Abuse and Neglect) ist ein evidenzbasiertes, aufsuchendes Behandlungsprogramm zur Reduktion von Kindesmisshandlung und/oder -vernachlässigung in den betroffenen Familien. Die allgemeine Wirksamkeit der Behandlung konnte in einer randomisierten kontrollierten Studie demonstriert werden. Die bedeutende Frage, welche Kinder und Familien von der MST-CAN inwiefern profitieren, blieb bis dato jedoch unbeantwortet. Ziel der vorliegenden kumulativen Dissertation ist es, einen Beitrag zu dieser Forschungslücke zu leisten. Dazu wurden drei Studien konzipiert. Alle Daten dafür entstammen der Evaluationsstudie zur MST-CAN in der Schweiz. Das Ziel der ersten Studie (Buderer et al., 2020) war die Untersuchung des allgemeinen Benefits der MST-CAN hinsichtlich der Verhaltensauffälligkeiten und der emotionalen Probleme der Kinder, ihrer Bindungsauffälligkeiten sowie der kindlichen Vernachlässigung. In einem quasiexperimentellen Studiendesign wurden unter Einbezug einer Vergleichsgruppe mit fremdplatzierten Kindern einer stationären Pflegeeinrichtung die Daten nach Alter und Geschlecht gematcht und die Ergebnisse beider Gruppen miteinander verglichen. Es zeigten sich eine Reduktion des Schweregrades der kindlichen Vernachlässigung sowie eine Reduktion der Verhaltensauffälligkeiten und der emotionalen Probleme bis sechs Monate nach der Behandlung. In beiden Gruppen ergab sich eine Reduktion der Verhaltensauffälligkeiten, der emotionalen Probleme und der Bindungsauffälligkeiten. Die zweite Studie (Buderer et al., 2024) hatte zum Ziel, die Charakteristika der zur MST-CAN zugewiesenen Kinder und Familien sowie deren Zusammenhänge mit den Behandlungsergebnissen in einem personenorientierten Ansatz zu untersuchen. Es konnten fünf Subgruppen auf Basis der kindlichen

Psychopathologie identifiziert werden: a) Kinder mit ängstlich-vermeidenden Symptomen, b) Kinder mit multiplen Symptomen, c) Kinder mit externalisierenden Symptomen, d) Kinder mit normativen Emotionen und normativem Verhalten sowie Eltern, die weniger gestresst waren und weniger psychische Belastungen aufwiesen, sowie e) Kinder mit internalisierenden Symptomen und Eltern, deren psychische Belastung sich verschlechterte. In der dritten Studie (Buderer et al., 2024) wurden mittels kombiniertem variablen- und personenorientiertem Ansatz die differentiellen Behandlungsergebnisse und Verläufe der Subgruppen im Sinne von Symptomklassenveränderungen untersucht. Die Ergebnisse zeigen, dass vier der fünf Gruppen (80 %) von der Behandlung profitierten. Kinder mit externalisierenden Symptomen hatten den größten Benefit. Kinder mit multiplen Symptomen zeigten Verbesserungen in einzelnen Symptombereichen. Für Kinder mit ängstlich-vermeidenden Symptomen war die Behandlung hinsichtlich ihrer spezifischen Symptomatik von Nutzen. Kinder mit internalisierenden Symptomen zeigten keine Veränderungen, wobei Kinder mit normativen Emotionen und ebensolchem Verhalten Verbesserungen aufwiesen. Die kindliche Vernachlässigung konnte bei drei (60 %) Subgruppen reduziert werden. Die LICUR-Methode (Linking clusters after removal of a residue) ergab stabile Subgruppen über die Messzeitpunkte hinweg für Kinder mit externalisierenden und multiplen Symptomen und weist damit auf Symptomklassenstabilität hin. Kinder mit internalisierenden Symptomen wechselten die Subgruppe zu den Kindern mit Symptomen des sozialen Rückzugs.

Die Studienergebnisse legen die allgemeine Wirksamkeit der MST-CAN in der Schweiz nahe und liefern Evidenz für das Vorhandensein von Subgruppen mit unterschiedlichen klinischen Bedürfnissen, die gut auf die Behandlung ansprechen, sich jedoch in den Ausprägungen der Veränderungen unterscheiden. Die Untersuchung der Passung von Kindern und Familien mit der Behandlung kann

bedeutende Erkenntnisse über die individuellen Bedürfnisse der Kinder und der Familien liefern, woraus sich passgenaue Interventionen ableiten lassen, insbesondere für diejenigen Kinder, die weniger oder nicht auf die Behandlung ansprechen. Die Ergebnisse dieser Dissertation können für andere Behandlungsprogramme mit Kindern und Familien eines Hochrisiko-Kontextes von Interesse sein.

## 1. Einleitung

„What works for whom?" Diese Frage stellten Fonagy et al. (2002) bereits zwei Dekaden zuvor in ihrem bedeutenden Review zu Behandlungen von Kindern und Jugendlichen. Dabei haben sie die Passung zwischen Klient:in und geeigneter Therapie als zentralen Aspekt und Erfolgsfaktor der Psychotherapie hervorgehoben und eine fehlende Passung als eines der Hauptprobleme der Evidenz in der Wirksamkeitsforschung identifiziert (Fonagy et al., 2002). Auch im Forschungsbereich zur individualisierten Psychotherapie wird die Notwendigkeit betont, über Störungen hinauszugehen und evidenzbasierte Therapien an die Charakteristika der Klient:innen anzupassen (Brakemeier & Herpertz, 2019; Norcross & Wampold, 2011, 2018). Lanza und Rhodes (2013) konstatieren in diesem Zusammenhang, dass das beste Behandlungsergebnis nur dann realisiert werden kann, wenn das richtige Programm den richtigen Individuen oder Familien angeboten wird und die Behandlungselemente effektiv auf die verschiedenen Subgruppen zugeschnitten sind.

In der wissenschaftlichen Praxis wird häufig die allgemeine Wirksamkeit von Behandlungen untersucht und ohne den Aspekt, ‚für wen' die Behandlungen wirken, zu berücksichtigen (Fonagy et al., 2002; Norcross & Wampold, 2011, 2018). Insbesondere manualisierte Behandlungsprogramme stehen vor der Herausforderung, mit einem standardisierten Behandlungskonzept für eine große Bandbreite an Klient:innen wirksam sein zu müssen. Die Identifikation der unterschiedlichen Bedürfnisse der Klient:innen im Rahmen solcher Behandlungsprogramme und deren unterschiedliches Ansprechen auf eine Behandlung eröffnen die Möglichkeit, maßgeschneiderte Interventionen anzubieten. Dies kann ein Schritt hin zu einem individualisierteren Vorgehen in der Behandlung darstellen (Keles et al., 2021; Mertens et al., 2017).

Im Kontext der Multisystemischen Therapie (MST, Hengeller et al., 2009), als manualisierte Behandlung für Kinder und Jugendliche mit ernsthaft dissozialem Verhalten, gibt es bisher drei Studien, in denen die Frage, was für wen wirkt, untersucht wurde. Für die Multisystemische Therapie Kinderschutz (MST-CAN, Multisystemic Therapy for Child Abuse and Neglect; Swenson et al., 2010), als adaptierte Form der MST, dagegen liegen hierzu

noch keine Studien vor. Vor diesem Hintergrund war es das Ziel der vorliegenden Dissertation, als erste Forschungsarbeit diese Frage für die MST-CAN zu beantworten. Die Dissertation umfasst drei Studien mit quer- und längsschnittlichen Studienansätzen. Als Grundlage wurde zuerst der allgemeine Nutzen des Behandlungsprogramms untersucht. Nachfolgend wurden die individuellen Charakteristika der zugewiesenen Kinder und Familien analysiert und Subgruppen mit ähnlichen Mustern basierend auf der kindlichen Psychopathologie zusammengefasst. Daraufhin wurden die differentiellen Behandlungsergebnisse und die Symptomverläufe der Subgruppen ermittelt. Die Ergebnisse tragen zu einem besseren Verständnis der klinischen Bedürfnisse der Kinder und der Familien bei, wodurch Interventionen bedarfsgerecht angepasst werden können. Das Wissen kann auf andere Behandlungsprogramme für Kinder und Jugendliche eines Hochrisiko-Kontextes übertragen werden und für Kliniker:innen und Forschende gleichermaßen von Interesse und Bedeutung sein.

## 2. Theoretischer Hintergrund

Kinder, die in ihren Familien von Misshandlung und/oder Vernachlässigung betroffen sind, haben ein erhöhtes Risiko, an einer Vielzahl verschiedener psychischer Störungen und Komorbiditäten zu erkranken (Bürgin et al., 2023; Schmid et al., 2013). Unterschiedliche Studien haben den Zusammenhang zwischen Kindesmisshandlung/-vernachlässigung mit externalisierenden und internalisierenden Symptomen (Hunt et al., 2017; Jaffee, 2017; Metha et al., 2021), Psychopathologie (Francis et al., 2023) und einer Reihe von psychischen Störungen wie Depressionen, Angststörungen, posttraumatischen Belastungsstörungen, Substanzmissbrauch und Suizidversuchen (Copeland et al., 2018; Jaffee, 2017; Metha et al., 2021; Norman et al., 2012) belegt.

Jeder Fall von Kindesmisshandlung/-vernachlässigung ist für sich genommen hoch individuell, komplex und lässt sich durch eine Vielzahl verschiedener Kindesfaktoren charakterisieren (Mulder et al., 2018; Ogle et al., 2022; Sidebotham et al., 2006; Stith et al., 2009). Behandlungsprogramme müssen dieser Komplexität Rechnung tragen und ihre Effektivität über eine Bandbreite verschiedener Altersstufen, psychischer Störungen und

familiärer Krisen hinweg demonstrieren. Um das Risiko erneuter Vorkommnisse von Kindesmisshandlung/-vernachlässigung zu reduzieren, müssen die kindliche Psychopathologie, aber auch Elternfaktoren zur Verbesserung der Eltern-Kind-Interaktion adressiert werden (Stith et al., 2009; Swenson et al., 2011). Die Anzahl an Behandlungsprogrammen zur Prävention und zur Reduktion von Kindesmisshandlung/-vernachlässigung ist in den letzten Jahrzehnten gewachsen, jedoch konnten in Metaanalysen nur wenige Programme ihre Effektivität unter Beweis stellen (Euser et al., 2015; van der Put et al., 2018). Der Fokus der Studien und der Metaanalysen lag auf der allgemeinen Wirksamkeit der Behandlungen und der Identifikation effektiver Behandlungskomponenten. Ob es Subgruppen mit spezifischen klinischen Bedürfnissen gibt, die in unterschiedlicher Weise auf die Behandlungen ansprechen, und wie effektiv die kindliche Psychopathologie adressiert wurde, geht aus diesen Studien nicht hervor. Die Sortierung und die Einordnung von Studien in diesem Bereich gestalten sich generell herausfordernd, da sich die untersuchten Behandlungen in ihrem inhaltlichen Fokus unterscheiden. Es werden beispielsweise verschiedene Formen von Misshandlung und/oder Vernachlässigung durch die Behandlungen angesprochen oder in Abhängigkeit der unterschiedlichen Formen werden die Effekte auf nur eine Störung oder auf mehrere Störungen untersucht. Außerdem divergieren die Behandlungen darin, an wen sie gerichtet sind – entweder nur an das Kind, nur an die Eltern oder an die Kinder und die Eltern (Fonagy et al., 2014).

Sollen manualisierte Behandlungsprogramme stärker auf die individuellen Bedürfnisse zugeschnitten werden, bringt dies ein Spannungsfeld zur Manualtreue mit sich. Deren Bedeutung wird häufig durch die Begründer:innen der Behandlungsprogramme in den Mittelpunkt gerückt (Collyer et al., 2019). In Metaanalysen konnte jedoch bisher kein signifikanter Zusammenhang zwischen der Manualtreue und dem Behandlungsergebnis gezeigt werden (Collyer et al., 2019; Webb et al., 2010). In drei MST-Studien dagegen wurden starke Zusammenhänge zwischen der Manualtreue und dem Behandlungsergebnis gefunden (Huey et al., 2000; Schoenwald et al., 2008), die auf Grundlage von

Aufzeichnungen in rechtlichen Akten noch Jahre später evident waren (Schoenwald et al., 2009). Für die MST-CAN liegen diesbezüglich noch keine Untersuchungen vor.

### 2.1 Multisystemische Therapie Kinderschutz

Die Multisystemische Therapie ist ein vielschichtiges, aufsuchendes Behandlungsprogramm, das ursprünglich für Familien mit Kindern, die ernsthaft dissoziales Verhalten zeigen, entwickelt wurde und eine Alternative für eine außerhäusliche Unterbringung darstellen sollte. Die Begründer:innen der MST gehen davon aus, dass die Jugendlichen Probleme zeigen, die durch multiple Faktoren bestimmt sind, so dass sie mit komplexen Interventionen, die die Jugendlichen selbst sowie das Umfeld einbeziehen, behandelt werden sollten. Theoretisch gründet sich die MST damit auf dem sozialökologischen Modell nach Bronfenbrenner (1979), das Kinder in multiplen Systemen (Eltern, Familien, soziales Netzwerk), die ihre Entwicklung beeinflussen, eingebettet sieht. Die MST-CAN (Swenson et al., 2010) ist eine adaptierte Form der MST für den Bereich Kinderschutz. Die Behandlung richtet sich an Familien und deren Kinder in einer Altersspanne von sechs bis 17 Jahren, bei denen das Kindeswohl aufgrund physischer Misshandlung und/oder Vernachlässigung gefährdet ist.

Bei der MST-CAN steht im Vergleich zur MST das Verhalten der Eltern stärker im Fokus, da es ihr Verhalten ist, das zu einer Anmeldung zum Programm geführt hat. Dabei wird von einer längeren Behandlungsdauer von ca. sechs bis neun Monaten (vgl. vier Monate bei der MST) ausgegangen. Die Therapeuten absolvieren ein fünftägiges MST-CAN-Training und nehmen alle drei Monate an einem Auffrischungskurs teil. Außerdem schließen sie ein viertägiges Training zur Behandlung von posttraumatischen Belastungsstörungen ab.

Beide Behandlungsprogramme basieren auf neun Behandlungsprinzipien (s. Anhang A: Tabelle 1) und folgen einem strukturierten analytischen Prozess, der eine vertiefte Diagnostik der Risikofaktoren des Verhaltens einschließt, das zur Zuweisung geführt hat. Interventionen werden infolgedessen auf die Risikofaktoren ausgerichtet, die als aufrechterhaltende und/oder auslösende Faktoren des Verhaltens identifiziert wurden. Es werden in jeder Familie diejenigen Risikofaktoren untersucht, die auch in der

wissenschaftlichen Literatur mit Kindesmisshandlung und/oder -vernachlässigung über verschiedene Systeme hinweg (individuell, Eltern, Familie und soziales Netzwerk) ursächlich oder als in Verbindung stehend angesehen werden (Sidebotham et al., 2006; Slep & O'Leary, 2007). Die Behandlung beinhaltet gegenüber der MST zusätzliche Anpassungen, um den besonderen Herausforderungen im Kinderschutzbereich zu genügen (Swenson et al., 2010). Sie integriert eine Vielfalt an evidenzbasierten Interventionen (kognitive Verhaltenstherapie, Familientherapie, Elterntraining). In Tabelle 1 ist eine Übersicht über das Therapiekonzept der MST-CAN nach Rhiner et al. (2012) dargestellt. Eine detaillierte Beschreibung der MST-CAN findet sich in einem Buchkapitel von Swenson und Schaeffer (2012).

MST-Programme sind von MST Services lizensiert (www.mstservices.com). Das MST-Institut (MSTI.org) ist eine Non-Profit-Organisation, die webbasierte Informationen und Qualitätssicherungswerkzeuge für Institutionen bereitstellt, die MST-Programme implementieren. Es gibt weltweit über 500 MST-Teams, davon 31 MST-CAN-Teams in sechs Ländern (www.mstservices.com, 2024).

Die Wirksamkeit der MST-CAN wurde in einer randomisierten kontrollierten Studie (RCT) von Swenson et al. (2010) überprüft. Die Kontrollgruppe erhielt eine intensivierte, ambulante Behandlung, die ein Eltern-Gruppentraining sowie weitere Formen notwendiger Behandlungen (ambulant, stationär oder Suchttherapie) beinhaltete. Die Eltern in der MST-CAN-Bedingung waren insgesamt mit der Behandlung zufriedener, zeigten eine stärkere Reduzierung der psychischen Belastung, der kindlichen Vernachlässigung und der körperlichen Misshandlung der Kinder sowie eine Steigerung der sozialen Unterstützung. Sechszehn Monate nach der Behandlung zeigten die Kinder in der MST-CAN-Bedingung eine stärkere Verbesserung der internalisierenden Symptomatik, weniger Fremdplatzierungen und weniger Platzierungswechsel. Diese erste RCT-Studie konnte aufzeigen, dass MST-CAN eine effektive Behandlung für diese schwer erreichbaren und belasteten Familien darstellt, in denen oft psychische Störungen, Substanzmissbrauch oder Traumatisierungen vorkommen. In der Metaanalyse von Euser et al. (2015), in der die

Wirksamkeit von Behandlungsprogrammen zur Prävention oder zur Reduzierung von Misshandlung untersucht wurde, zeigte sich die MST-CAN als eines von fünf Interventionsprogrammen mit einem positiven und nachhaltigen Effekt auf die Verbesserung von Kindesmisshandlung.

**Tabelle 1.** Therapiekonzept der MST-CAN

| | |
|---|---|
| **Behandlungsziele der MST-CAN**<br>• Prävention weiterer Misshandlung<br>• Reduktion von außerhäuslichen Platzierungen und Hospitalisierungen<br>• Wenn die Ressourcen der Familien erschöpft sind: ein gemeinsamer Plan für externe Obhut | **Behandlungskapazität**<br>• 3 bis 4 Familien pro Therapeut:in (12 bis 16 Fälle pro Team)<br>• Alle Familienmitglieder werden mit in die Behandlung einbezogen<br>• Behandlungsdauer: 6 bis 9 Monate<br>• 24h/7d Erreichbarkeit |
| **Einschlusskriterien**<br>• Physische Misshandlung und/oder Vernachlässigung innerhalb der letzten 180 Tage, festgestellt durch eine Kindesschutzbehörde<br>• Indexkind ist im Alter von 6 bis 17 Jahren<br>• Das Kind lebt zu Hause oder es gibt einen kurzfristigen Rückkehrplan | **Ausschlusskriterien**<br>• Andauernder sexueller Missbrauch<br>• Andauernde häusliche Gewalt<br>• Andauernde Psychose eines Elternteils<br>• Kinder ohne identifizierbare Bezugsperson<br>• Kinder, bei denen es keinen Rückkehrplan zur Ursprungsfamilie gibt |
| **Behandlungsziele für die Kinder**<br>• Weniger Angstsymptome<br>• Weniger posttraumatische Symptome<br>• Weniger Verhaltensauffälligkeiten (internalisierend und externalisierend)<br>• Bessere Schulleistung | **Behandlungsziele für die Eltern**<br>• Verbesserung der elterlichen Psychopathologie<br>• Reduktion der elterlichen physischen Misshandlung, Aggression und Vernachlässigung gegenüber dem Kind<br>• Verbesserung der Erziehungskompetenzen<br>• Stärkung des Netzwerks um die Familie (Verwandte, Nachbarn, Freunde) zur Unterstützung der Elternrolle |

## 2.2 Welche Kinder, Jugendlichen und Familien profitieren inwiefern von der MST-CAN?

Für die MST wie auch die MST-CAN konnte die allgemeine Wirksamkeit in randomisierten kontrollierten Studien belegt werden (Euser et al., 2015; Henggeler, 2011; Swenson et al., 2010; van der Strouve et al., 2014). Ob es Subgruppen gibt, für die die Behandlung mehr oder weniger wirksam ist, wurde für die MST in bisher drei Studien untersucht (Halliday-Boykins et al., 2004; Keles et al., 2021; Mertens et al., 2017). Für die MST-CAN dagegen ist die vorliegende Dissertation die erste Forschungsarbeit, die der Frage nachgeht, welche Kinder, Jugendlichen und Familien inwiefern von der MST-CAN profitieren. Der Mangel an Studien, in denen Subgruppen analysiert werden, kann historisch betrachtet auf das Überwiegen variablenorientierter Forschung seit dem letzten Jahrhundert zurückgeführt werden (Bergman et al., 2003). Personenorientierte Ansätze, die Entwicklungsverläufe unterschiedlicher Subgruppen untersuchen, haben dagegen erst in den letzten Dekaden an Bedeutung gewonnen (Nagin & Odgers, 2010) und werden unter anderem in der Familienpsychologie für die Analyse von Subgruppen vorgeschlagen (Henry et al., 2005). Einzuordnen sind diese Studien im Rahmen von Phase-IV-Studien (Fonagy et al., 2002).

Grundlage für diese Art von Forschung ist die Beschreibung von Familien anhand verschiedener Charakteristika. Familien, in denen ein Risiko für Kindesmissbrauch und/oder -vernachlässigung besteht, werden häufig anhand von Risikofaktoren basierend auf dem oben benannten sozialökologischem Modell nach Bronfenbrenner beschrieben. Dazu, wie diese Risikofaktoren in bestimmten Familien verteilt sind, gibt es jedoch aus dem oben genannten Grund kaum Forschung und je nach Faktoren, die als diskriminierender Aspekt in die Analysen eingehen, ist die Vergleichbarkeit zwischen den Studien limitiert. Beispielhaft kann die Studie von Rijbroek et al. (2019) herangezogen werden, in der 250 Familien einer Kinderschutzpopulation basierend auf Risiko- und Schutzfaktoren auf Kindes-, Eltern- und Umfeldebene beschrieben wurden. Es wurden fünf Subgruppen auf Grundlage von elterlichen Risikofaktoren identifiziert. Die erste Gruppe zeichnete sich durch multiple

Elternprobleme aus, wohingegen die zweite Gruppe durch einschneidende Lebensereignisse gekennzeichnet war. Die dritte Gruppe wies sozioökonomische Schwierigkeiten, Wohnungs- und finanzielle Probleme, Arbeitslosigkeit sowie soziale Isolation auf. Die vierte war durch niedrige Erziehungsfertigkeiten und die fünfte Gruppe durch Risikofaktoren auf Kindesebene charakterisiert.

Befunde für differentielle Behandlungsergebnisse bei Kindern und Jugendlichen eines Hochrisiko-Kontextes können lediglich aus Einzelstudien abgeleitet werden. Die genannten drei Studien im Kontext der MST konnten eine Variabilität in den Behandlungsverläufen und -ergebnissen zeigen. Keles et al. (2021) haben 1674 Jugendliche, die MST in Norwegen erhielten, auf Heterogenität in den Behandlungsverläufen untersucht. Hinsichtlich der MST-Ergebnisvariablen (z. B. das Kind lebt zu Hause, geht zur Arbeit oder zur Schule) zeigte die Mehrzahl der Jugendlichen einen positiven Verlauf. Jedoch wurden auch kleinere Subgruppen entdeckt, die nicht von der Behandlung profitierten und beispielweise fremdplatziert werden mussten. Alter und Geschlecht zeigten sich als Prädiktoren für unterschiedliche Verläufe, so dass die MST vor allem für jüngere Kinder besser zu wirken schien.

Mertens et al. (2017) haben die unterschiedlichen Effekte der MST auf das externalisierende Verhalten bei 147 Jugendlichen in den Niederlanden analysiert. Sie konnten sechs Subgruppen mit jeweils unterschiedlichen Behandlungsverläufen identifizieren, wobei sich bei vier Gruppen das externalisierende Verhalten reduzieren ließ, bei einer Gruppe keine Veränderung des externalisierenden Verhaltens zu beobachten war und eine Gruppe sich diesbezüglich verschlechterte. Prädiktoren für die unterschiedlichen Verläufe waren das elterliche Kompetenzgefühl und der geringe Bezug zu prosozialen Peers.

Halliday-Boykins et al. (2004) haben in ihrer Untersuchung von 156 Jugendlichen, die mit der MST in den USA nach einer suizidalen Krise behandelt wurden, fünf verschiedene Verläufe basierend auf den psychopathologischen Symptomen entdeckt: Solche mit einer starken Verbesserung, einer starken Verschlechterung, einer grenzwertigen Verbesserung,

einer grenzwertigen Verschlechterung und einem subklinischen Verlauf. Prädiktoren für eine Symptomverschlechterung waren jüngeres Alter, weniger Suizidalität, Hoffnungslosigkeit bei den Jugendlichen sowie Eltern mit subjektiv wahrgenommener Handlungsfähigkeit. Aus den Studienergebnissen haben die Autoren geschlossen, dass – entgegen der generellen Annahme – Jugendliche mit schwerwiegender Psychopathologie ein erhöhtes Risiko zeigen, nicht von der Behandlung zu profitieren und auf einem hohen Symptomlevel zu verbleiben (Halliday-Boykins et al., 2004).

Bezüglich der Entwicklung von Symptomklassen im Rahmen einer Behandlung von Familien eines Hochrisiko-Kontextes ist die Forschungsliteratur begrenzt. In einer Studie haben Zhang und Slesnick (2018) vier Klassen von internalisierendem und externalisierendem Verhalten in einer Gruppe von Kindern mit substanz-missbrauchenden Eltern untersucht. Achtzehn Monate nach der Behandlung gehörten Kinder der externalisierenden Gruppe wahrscheinlicher zur normativen Gruppe und die Kinder der komorbiden Klasse wechselten in die internalisierende Gruppe. Die Ergebnisse weisen auf Verbesserungen bei manchen Symptomgruppen hin; verallgemeinernde Aussagen können daraus jedoch nicht getroffen werden.

Vor dem Hintergrund, dass es keine Studien gibt, die die Wirksamkeit evidenzbasierter Behandlungen auf die kindliche Vernachlässigung untersucht haben (Euser et al., 2015), können bezüglich einer differentiellen Wirksamkeit keine Aussagen gemacht werden.

## 3. Ziele und Fragestellungen

Vor dem Hintergrund großer Heterogenität und des komplexen Zusammenspiels von Risikofaktoren bei Familien, in denen Kindesmisshandlung und/oder -vernachlässigung auftritt, stellt sich auch für die MST-CAN die Frage nach dem Vorliegen verschiedener Subgruppen mit unterschiedlichen Charakteristika und Variabilität in den Behandlungsergebnissen. Das Hauptziel der vorliegenden Dissertation ist somit die Untersuchung der Frage, welche Kinder, Jugendlichen und Familien inwiefern von der MST-CAN profitieren. Dazu wurden drei Studien konzipiert. In der ersten Studie wurde der

allgemeine Nutzen der MST-CAN hinsichtlich kindlicher Vernachlässigung, Verhaltensauffälligkeiten, emotionaler Probleme sowie Bindungsauffälligkeiten als Grundlage für die weiteren Studien untersucht. In der zweiten Studie wurden die Subgruppencharakteristika der Kinder und der Familien, basierend auf der kindlichen Psychopathologie, sowie deren Zusammenhänge mit den Behandlungsergebnissen analysiert (Fokus: ‚Welche Kinder und Familien profitieren?'). In der dritten Studie wurden in einem ersten Schritt die differentiellen Veränderungen der Verhaltensauffälligkeiten und der emotionalen Probleme sowie der kindlichen Vernachlässigung auf Subgruppenebene ermittelt. In einem zweiten Schritt wurden die Veränderungen der Subgruppen über zwei Messzeitpunkte hinweg überprüft, um die Symptomverläufe zu analysieren (Fokus: ‚Inwiefern profitieren die Kinder und die Familien?'). Es wurden die folgenden Forschungsfragen verfolgt:

1. Was ist der allgemeine Nutzen der MST-CAN in Bezug auf die MST-CAN-Ergebnisvariablen, die kindliche Vernachlässigung, Verhaltensauffälligkeiten, emotionalen Probleme sowie Bindungsauffälligkeiten? Ist eine Reduktion der Verhaltensauffälligkeiten, der emotionalen Probleme sowie der Bindungsauffälligkeiten vergleichbar mit der Reduktion in einer Vergleichsgruppe einer stationären Maßnahme in einer Pflegeeinrichtung?
2. Können bei den zur MST-CAN zugewiesenen Familien und ihren Kindern Subgruppen mit spezifischen Charakteristika identifiziert werden und stehen diese im Zusammenhang mit den Behandlungsergebnissen?
3. Wie verändern sich Verhaltensauffälligkeiten und emotionale Probleme sowie die kindliche Vernachlässigung innerhalb der auf den Psychopathologien beruhenden Subgruppen? Wie verändern sich diese Subgruppen zwischen den beiden Messzeitpunkten vor und nach der Behandlung?

## 4. Methoden

Die drei Forschungsfragen wurden mit quer- und längsschnittlichen Studienansätzen untersucht. Alle Daten entstammen der Interventionsstudie zur Evaluation der MST-CAN in

der Schweiz. Zur Beantwortung der ersten Forschungsfrage wurde ein quasiexperimenteller Studienansatz unter Einbezug einer Vergleichsgruppe mit fremdplatzierten Kindern einer stationären Maßnahme in einer Pflegeeinrichtung umgesetzt. Um die zweite und die dritte Forschungsfrage zu beantworten, wurde ein quer- und längsschnittlicher Ansatz mit kombinierten variablen- und personenorientierten Methoden angewandt.

### 4.1 Effects of multisystemic therapy for child abuse and neglect on severity of neglect, behavorial and emotional problems, and attachment disorder symptoms in children (Studie I)

Zwischen Juli 2011 und November 2017 begannen in den Kantonen Thurgau und Basel-Stadt 168 Familien eine Behandlung mit der MST-CAN. Davon erklärten sich 132 Eltern-Kind-Dyaden bereit, an der Studie teilzunehmen. Am Ende der Behandlung konnten 88 Eltern-Kind-Dyaden und zur Follow-up-Befragung sechs Monate nach der Behandlung 60 Eltern-Kind-Dyaden in die Analyse eingeschlossen werden. Als Vergleichsgruppe wurden 115 Kinder und Jugendliche aus stationären Pflegeeinrichtungen herangezogen. Diese nahmen an einer ergebnisorientieren Qualitätssicherung in stationären Einrichtungen (Equals-Programm; Schröder et al., 2013) teil. Für das Matching standen Daten von 43 Kindern (24 Jungen und 19 Mädchen) zu zwei Messzeitpunkten zur Verfügung. Die Studie wurde von den Ethikkommissionen Ostschweiz (EKOS) und Nordwestschweiz (EKNZ) genehmigt.

Es gab vier primäre MST-CAN-Ergebnisvariablen (das Kind lebt zu Hause, das Kind geht in die Schule, es gibt keine neuen Anzeigen gegen die Eltern und es gibt keine neuen Gefährdungsmeldungen), die durch die MST-CAN-Teamleiter:innen unmittelbar nach Beendigung der MST-CAN sowie sechs, zwölf und 18 Monate danach erfasst wurden. Die Eltern beantworteten eine Fragebogenbatterie zu drei Messzeitpunkten: zu Beginn der Behandlung (t1), zum Ende der Behandlung (t2) sowie sechs Monate nach Beendigung der Behandlung (t3). Um die Verhaltensauffälligkeiten und die emotionalen Probleme des Kindes zu erheben, wurde die deutsche Version der Child Behavior Checklist (CBCL/4-18; Arbeitsgruppe Deutsche Child Behavior Checklist, 1998) verwendet. Für die Erfassung der

Bindungsauffälligkeiten wurde die deutsche Übersetzung des Relationship Problems Questionnaire (RPQ; Minnis et al., 2002; Minnis et al., 2007; deutsche Version, Schröder et al., 2019) herangezogen. Die Art und der Schweregrad der Vernachlässigung wurden im Fremdurteil der Sozialarbeiter:innen der zuweisenden Behörde mit dem Ontario Child Neglect Index (CNI; Trocmé, 1996; deutsche Übersetzung, Pérez et al., 2017) zum Beginn und zum Ende der MST-CAN telefonisch erfasst.

In den stationären Pflegeeinrichtungen füllten die Kinder und die Sozialarbeiter:innen in der Funktion der primären Bezugsperson Fragebögen aus, von denen die Werte der CBCL und des RPQ in die Analyse eingingen. Die durchschnittliche Dauer zwischen den Messzeitpunkten t1 und t2 betrug für die CBCL 16.33 Monate (SD = 11.39) und für den RPQ 13.14 Monate (SD = 6.17). Ein dritter Messzeitpunkt konnte aufgrund der begrenzten Ressourcen im Rahmen der Studie nicht umgesetzt werden. Alle Analysen wurden mit IBM SPSS Statistics 24 berechnet. Zur Beantwortung der ersten Forschungsfrage wurden Häufigkeiten für die MST-CAN-Ergebnisvariablen berechnet. Die Veränderung im Schweregrad der Vernachlässigung vor und nach der MST-CAN wurde mithilfe von *t*-Tests für abhängige Stichproben ermittelt. Um die Veränderung der Verhaltensauffälligkeiten und der emotionalen Probleme über alle drei Messzeitpunkte hinweg zu untersuchen, wurden Varianzanalysen (ANOVAs) mit Messwiederholung durchgeführt, für Veränderungen in den Bindungsauffälligkeiten eine ANOVA nach Friedmann. Für die ANOVA mit Messwiederholung wurde Cohen's *f* als Effektgröße berichtet, wobei 0.10 als kleine, 0.25 als mittlere und 0.40 als große Effektstärke betrachtet wurden (Cohen, 2013). Für die ANOVA nach Friedmann wurde der Korrelationskoeffizient nach Pearson *r* berechnet, mit 0.10 als kleiner, 0.30 als mittlerer und 0.50 als großer Effektstärke (Cohen, 2013). Zur Untersuchung der Gruppenunterschiede wurden die beiden Gruppen nach Alter und Geschlecht gematcht und mithilfe einer zweifaktoriellen ANOVA bezüglich der Verhaltensauffälligkeiten, der emotionalen Probleme und der Bindungsauffälligkeiten analysiert. Die berichtete Effektstärke war hierfür Cohen's *d* mit 0.10 als kleiner, 0.25 als mittlerer und 0.40 als großer Effektstärke (Cohen, 2013).

### 4.2 Child and family characteristics in multisystemic therapy for child abuse and neglect (MST-CAN): Are there associations with treatment outcome? (Studie II)

Es wurden Familien eingeschlossen, die zwischen Juli 2011 und Dezember 2018 im Kanton Thurgau und zwischen November 2014 und Oktober 2022 im Kanton Basel-Stadt der Behandlung zugewiesen wurden. Von insgesamt 285 angefragten Familien gaben 200 Eltern ihre Einwilligung zur Teilnahme. Die finale Stichprobe umfasste 194 Eltern-Kind-Dyaden. Für diese Studie wurden Daten zu den beiden Messzeitpunkten vor und nach der Behandlung verwendet. Die Datenerhebung entsprach dem Prozedere, wie es in Kapitel 4.1 beschrieben wurde. Aus der Fragebogenbatterie wurden im Fremdurteil der Eltern die CBCL zur Erhebung der Verhaltensauffälligkeiten und der emotionalen Probleme genutzt. Um die elterlichen psychischen Belastungen zu erfassen, wurde die Brief Symptom Inventory (BSI, Derogatis & Melisarotos, 1982; deutsche Version, Franke, 2000) angewandt und zur Erhebung des elterlichen Stresses die Parental Stress Scale (PSS, Berry & Jones, 1995; deutsche Version, Kölch & Schmid, 2008) eingesetzt. Die primären Ergebnisvariablen und der Schweregrad der Vernachlässigung wurden, wie in Kapitel 4.1 beschrieben, zum Beginn und zum Ende der MST-CAN erhoben. Die statistischen Analysen wurden mit IBM SPSS 29 durchgeführt. Zur Identifikation von Subgruppen wurde eine hierarchische Clusteranalyse nach Ward (1963) mit quadrierten euklidischen Distanzen auf Basis der acht CBCL-Subskalen (sozialer Rückzug, körperliche Beschwerden, Angst/Depression, soziale Probleme, Schizoid/Zwanghaft, Aufmerksamkeitsprobleme, regelverletzendes und aggressives Verhalten) berechnet. Für die Analyse der Subgruppencharakteristika wurden Maße untersucht, die nicht in die hierarchische Clusteranalyse eingingen (z. B. Alter, elterliche psychische Belastung und elterlicher Stress). Für intervallskalierte Variablen (z. B. BSI, PSS) wurden einfaktorielle Varianzanalysen mit Tukey-post-hoc-Tests berechnet. Als Effektgröße wurde das partielle Eta-Quadrat $\eta_p^2$ mit 0.06 als kleiner, 0.06 bis 0.14 als mittlerer und 0.14 als großer Effektgröße berichtet (Cohen, 2013).

Für nominale Variablen (z. B. Geschlecht, Migrationshintergrund) wurden Chi-Quadrat-Tests durchgeführt. Um die Zusammenhänge der Subgruppen mit den

Behandlungsergebnissen zu untersuchen, wurden die Subgruppenunterschiede für verschiedene Ergebnisvariablen ermittelt. Für die primären Ergebnisvariablen wurden Chi-Quadrat-Tests angewandt, nachdem zuvor Häufigkeiten bestimmt worden waren. Für die intervallskalierten Variablen CNI, CBCL, BSI und PSS wurden zuerst Veränderungswerte berechnet (Gesamtwerte am Ende der Behandlung – Gesamtwerte zu Beginn der Behandlung) und anschließend mit einfaktoriellen ANOVAs und Tukey-post-hoc-Tests die Subgruppenunterschiede analysiert.

### 4.3 Differential treatment responses of maltreated and neglected children and adolescents following an evidence-based multisystemic intervention (Studie III)

Die Datengrundlage dieser Studie entsprach der von Studie II. Es wurden 14 zusätzliche Teilnehmer eingeschlossen, die zwischen Oktober 2022 und November 2023 der MST-CAN in Basel-Stadt zugewiesen wurden und der Studienteilnahme zustimmten. Die finale Stichprobe umfasste 208 Eltern-Kind-Dyaden. Analog zur Datenerhebung der Studie II wurde die CBCL zur Erfassung der Verhaltensauffälligkeiten und der emotionalen Probleme im Fremdurteil durch die Eltern eingesetzt. Zur Erhebung des Schweregrades der Vernachlässigung diente wiederum der CNI im Fremdurteil der zuweisenden Sozialarbeiter:innen. Die Daten wurden zu Beginn und zum Ende der Behandlung erhoben. Auf Basis der in Studie II identifizierten Subgruppen wurden zur Beantwortung der ersten Forschungsfrage *t*-Tests für abhängige Stichproben für jede Subgruppe einzeln berechnet. Es wurden die Mittelwertsunterschiede für alle CBCL-Skalen und für den CNI analysiert. Alle *p*-Werte wurden nach Bonferroni korrigiert. Zur Analyse der Subgruppenveränderungen zwischen den beiden Messzeitpunkten wurde die LICUR-Methode (**Li**nking of **C**l**u**sters after removal of a **R**esidue; Bergman et al., 2003) angewandt. Das Verfahren dient zur Analyse individueller Entwicklungen zwischen Clustern verschiedener Messzeitpunkte (s. Daukantaitė et al., 2019; Schmid et al., 2021; Viborg et al., 2018). Die Methode besteht aus drei Schritten: 1) Es werden multivariate Ausreißer identifiziert und von den weiteren Analysen ausgeschlossen, um Verzerrungen in der Clusteranalyse zu vermeiden. 2) Es wird eine hierarchische Clusteranalyse nach Ward mit dem quadrierten euklidischen Distanzmaß zu

jedem Messzeitpunkt durchgeführt. 3) Verläufe zwischen den Messzeitpunkten werden bezüglich der strukturellen und der individuellen Veränderung/Stabilität untersucht. Für Erstere wurden die Zentroide der beiden Clusterlösungen paarweise miteinander verglichen, indem die quadrierten euklidischen Distanzen zwischen den beiden Clusterlösungen ermittelt wurden. Zur Analyse der Letzteren wurden die beiden Clusterlösungen mittels Kreuztabellen auf erwartete und beobachtete Werte untersucht. Die Signifikanz wurde anhand des Fisher's Exact Tests überprüft, der auf einer hypergeometrischen Verteilung beruht. Um eine Alpha-Fehler-Inflation zu vermeiden, wurden Bonferroni-Korrekturen angewandt. Bei signifikant höheren beobachteten als erwarteten Werten wurde von einem ‚Entwicklungspfad' ausgegangen, bei signifikant kleineren Werten von einem ‚Anti-Entwicklungspfad', d. h. einer unwahrscheinlichen Transition zwischen den Clustern der verschiedenen Messzeitpunkte. Odds ratio (*OR*) wurden berechnet, um die Höhe der Wahrscheinlichkeit von Entwicklungspfaden zu bestimmen.

Zuletzt wurde die Clusterlösung des zweiten Messzeitpunkts auf subgruppenspezifische Charakteristika untersucht. Für intervallskalierte Variablen wurden einfaktorielle ANOVAs mit Tukey-post-hoc-Tests und für nominale Variablen Chi-Quadrat-Tests berechnet.

Alle Berechnungen wurden mit IBM SPSS 29 durchgeführt. Für die Analysen der individuellen Veränderungen (dritter Schritt der LICUR-Methode) wurde das ExaCon-Modul des Statistikpakets ROPstat 2.0 (Vargha et al., 2015) verwendet.

## 5. Zusammenfassung der Ergebnisse

Im Folgenden werden zusammenfassend die Ergebnisse der drei Studien vorgestellt. Detaillierte Ergebnisse finden sich in Anhang A bis C der einzelnen Studien.

### 5.1 Effects of multisystemic therapy for child abuse and neglect on severity of neglect, behavorial and emotional problems, and attachment disorder symptoms in children (Studie I)

Die Stichprobe der 158 teilnehmenden Kinder und Jugendlichen bestand aus 73 (46.2 %) Mädchen und 85 (53.8 %) Jungen, die durchschnittlich 9,36 (*SD* = 3.22) Jahre alt

waren. In der Vergleichsgruppe waren die 19 (44.2 %) Mädchen und die 24 (55.8 %) Jungen durchschnittlich 11.08 (*SD* = 2.50) Jahre alt. Zum Behandlungsende (n = 137) der MST-CAN lebten 126 (92.0 %) der Kinder zu Hause und 134 (97.8 %) gingen zur Schule oder zur Arbeit. In 124 (90.5 %) der Fälle gab es keine erneuten Anzeigen gegen die Eltern, und bei 115 (83.9 %) keine erneuten Gefährdungsmeldungen. Die Ergebnisse persistierten bis 18 Monate nach Abschluss der Behandlung. Die Werte im Child Neglect Index sanken signifikant zwischen t1 (*M* = 45.99, *SD* = 17.47) und t2 (*M* = 28.49, *SD* = 20.26; *t* = 9.568, *p* < 0.001, *n* = 116). Die Analysen ergaben eine Reduktion der CBCL-Gesamtwerte mit signifikanten Effekten über alle drei Messzeitpunkte hinweg ($F(1.83, 95.23) = 18.34$, $p < 0.001$, $\eta^2 = 0.26$), mit einer großen Effektgröße (*f* = 0.594). Auch für die Subskalen internalisierende ($F(2, 104) = 9.72$, $p < .001$, $\eta^2 = 0.16$) und externalisierende Probleme ($F(2, 104) = 14.55$, $p < .001$, $\eta^2 = 0.22$) wurden signifikante Reduktionen in den *T*-Werten über die drei Messzeitpunkte hinweg gefunden. Für beide Subskalen zeigten sich dabei große Effektstärken (internalisierende Probleme: *f* = .432; externalisierende Probleme: *f* = .530). Bei 25 (18.9 %) Kindern in der MST-CAN ließ sich für die Bindungsauffälligkeiten ein RPQ-Gesamtwert über dem Cut-off finden, was bei diesen Kindern auf Symptome einer Bindungsstörung hindeutet. Bonferroni-korrigierte Post-hoc-Analysen ergaben eine bedeutsame Reduktion der Werte zwischen t1 (*M* = 8.92, *SD* = 2.47) und t3 (*M* = 5.92, *SD* = 5.37; *p* = .050) mit einer großen Effektstärke (*r* = .544).

*Reduktion von emotionalen Problemen und Verhaltens- sowie Bindungsauffälligkeiten – MST-CAN vs. Vergleichsgruppe.* Hauptunterschiede zwischen den beiden Gruppen zeigten sich mit mittleren bis großen Effektstärken im CBCL-Gesamtwert (*p* = .011, *d* = 0.57), im CBCL externalisierende Probleme (*p* = .002, *d* = 0.69) sowie in der RPQ-Subskala gehemmtes Bindungsverhalten (*p* = .008, *d* = 0.81). Kinder aus der Vergleichsgruppe zeigten zu beiden Messzeitpunkten (t1 und t2) bei den drei Skalen höhere Werte als Kinder in der MST-CAN (s. Tabelle 2). Darüber hinaus ergaben sich signifikante Reduktionen mit mittleren bis großen Effektstärken für beide Gruppen in allen drei CBCL-Skalen und den RPQ-Skalen zwischen t1 und t2 (s. Tabelle 2). Ein signifikanter

Interaktionseffekt zwischen den Faktoren Gruppe und Zeit trat für die CBCL-Subskala externalisierende Probleme ($p$ = .017) mit einer mittleren Effektstärke ($d$ = 0.53) auf. Somit erfuhren die Kinder in der MST-CAN eine deutlichere Verbesserung der externalisierenden Probleme zwischen t1 ($M$ = 61.77, $SD$ = 10.42) und t2 ($M$ = 55.65, $SD$ = 10.10) als die Kinder der Vergleichsgruppe (t1: $M$ = 66.33, $SD$ = 12.02; t2: $M$ = 64.49, $SD$ = 9.86).

**Tabelle 2.** Deskriptive Statistiken und ANOVA mit Messwiederholung für die CBCL und den RPQ in der MST-CAN- und der Vergleichsgruppe

| Instrument | T1 | | T2 | | ANOVA mit Messwiederholung | | |
|---|---|---|---|---|---|---|---|
| | MST-CAN | VG | MST-CAN | VG | Effekt (G) | Effekt (Z) | Interkation G x Z |
| | *M (SD)* | *M (SD)* | *M (SD)* | *M (SD)* | *F (d)* | *F (d)* | *F (d)* |
| CBCL | | | | | | | |
| CBCL total | 64.16 | 67.86 | 57.77 | 64.88 | 6.85* | 28.27*** | 3.76 |
| | (11.20) | (9.35) | (12.06) | (8.70) | (0.57) | (1.16) | (0.42) |
| CBCL INT | 62.67 | 64.37 | 56.67 | 60.81 | 1.96 | 20.32*** | 1.33 |
| | (12.72) | (8.95) | (12.63) | (8.23) | (0.31) | (0.98) | (0.25) |
| CBCL EXT | 61.77 | 66.33 | 55.64 | 64.49 | 10.00** | 20.48*** | 5.93* |
| | (10.42) | (12.02) | (10.10) | (9.86) | (0.69) | (0.99) | (0.53) |
| RPQ | | | | | | | |
| RPQ total | 3.02 | 6.67 | 2.30 | 4.72 | 2.18 | 15.34*** | 0.24 |
| | (3.41) | (4.57) | (3.45) | (3.56) | (0.43) | (1.14) | (0.14) |
| RPQ ENT | 1.42 | 2.79 | 1.28 | 1.98 | 0.06 | 4.63* | 0.31 |
| | (2.24) | (2.90) | (2.15) | (2.49) | (0.07) | (0.63) | (0.16) |
| RPB GEH | 1.58 | 3.88 | 1.00 | 2.74 | 7.74** | 13.82** | 0.06 |
| | (1.92) | (2.71) | (1.66 | (2.56) | (0.81) | (1.08) | (0.07) |

*Anmerkungen*. VG = Vergleichsgruppe; CBCL = Child Behavior Checklist; INT = internalisierend; EXT = externalisierend; RPQ = Relationship Problems Questionnaire; ENT = enthemmt; GEH = gehemmt; $M$ = Mittelwert, $SD$ = Standardabweichung; G = Gruppe; Z = Zeit; $d$ = Effektstärke; $n$ = 43; $n_{MST\text{-}CAN}$ = 16, $n_{VG}$ = 33.

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

## 5.2 Child and family characteristics in multisystemic therapy for child abuse and neglect (MST-CAN): Are there associations with treatment outcome? (Studie II)

*Identifikation der Cluster.* Aus der Clusteranalyse ging eine 5-Cluster-Lösung als bedeutsamste, den Daten zugrundeliegende Struktur hervor. Die deskriptiven Statistiken und die Subgruppenunterschiede ermittelt durch eine einfaktorielle Varianzanalyse sind in

Tabelle 3 dargestellt. Die erste Gruppe (n = 59) zeigte auf den Skalen ‚sozialer Rückzug' und ‚Angst/Depression' klinisch auffällige Werte, was auf ein klinisches Bild von ängstlich-vermeidenden Kindern hindeutet. Die zweite Gruppe (n = 25) wies auf allen Skalen klinisch auffällige Werte auf und erfüllte die Kriterien des CBCL-Dysregulationsprofils, was als Indikator für das Vorliegen einer schwerwiegenden Psychopathologie angesehen werden kann. Die dritte Gruppe (n = 30) zeigte überwiegend klinisch auffällige Werte auf den Skalen, die den externalisierenden Problemen zugeordnet werden.

**Tabelle 3.** Einfaktorielle ANOVA für die fünf Subgruppen in der CBCL

| CBCL-Skala | Gruppe 1: *n* = 59 *M (SD)* | Gruppe 2: *n* = 25 *M (SD)* | Gruppe 3: *n* = 30 *M (SD)* | Gruppe 4: *n* = 68 *M (SD)* | Gruppe 5: *n* = 12 *M (SD)* | *F* | Tukey's HSD homogene Subgruppen |
|---|---|---|---|---|---|---|---|
| Sozialer Rückzug | 65.85 (7.06) | 73.84 (9.57) | 62.83 (7.98) | 53.71 (8.58) | 75.00 (7.47) | 41.65* | 2, 5 > 1, 3 > 4 |
| Körperliche Beschwerden | 63.75 (8.37) | 70.76 (8.67) | 54.53 (5.48) | 53.37 (4.87) | 74.50 (6.13) | 54.70* | 2, 5 > 1 > 3, 4 |
| Angst/ Depression | 65.85 (7.35) | 76.56 (5.94) | 65.20 (7.77) | 55.65 (6.02) | 72.75 (8.50) | 52.02* | 2, 5> 1, 3 > 4 |
| Soziale Probleme | 60.39 (8.15) | 66.84 (8.79) | 70.07 (8.73) | 55.57 (6.58) | 68.17 (7.60) | 24.37* | 3, 5, 2 > 1, 4 |
| Schizoid/ Zwanghaft | 56.88 (7.56) | 75.04 (5.88) | 65.17 (9.05) | 52.57 (5.56) | 70.92 (8.15) | 61.88* | 2, 5 > 3 > 1, 4 |
| Aufmerksam-keitsprobleme | 63.59 (8.23) | 72.40 (8.46) | 72.73 (6.27) | 55.72 (6.50) | 65.00 (5.69) | 41.16* | 2, 3 > 1, 5 > 4 |
| Regelverletz-endes Verh. | 59.97 (8.01) | 72.36 (7.12) | 68.07 (7.08) | 55.56 (5.39) | 55.00 (5.56) | 39.39* | 2, 3 > 1, 4, 5 |
| Aggressives Verhalten | 63.83 (8.55) | 75.16 (6.03) | 71.07 (8.98) | 55.10 (5.68) | 54.25 (4.35) | 52.14* | 2, 3 > 1 > 4, 5 |

*Anmerkungen.* CBCL = Child Behavior Checklist; Gruppe 1: Kinder mit ängstlich-vermeidenden Symptomen, Gruppe 2: Kinder mit multiplen Symptomen, Gruppe 3: Kinder mit externalisierenden Symptomen, Gruppe 4: Kinder mit normativen Emotionen und normativem Verhalten, Gruppe 5: Kinder mit internalisierenden Symptomen; Wertebereich: normal für T < 60, grenzwertig klinischer Bereich für T zwischen 60 und 63, klinisch auffällig für T > 64
* $p < .001$,

In der vierten Gruppe (n = 68) ergaben sich Werte im normalen Bereich für alle Subskalen, was auf eine Gruppe ohne psychopathologische Auffälligkeiten hinweist. Die fünfte Gruppe (n = 12) zeigte Werte im klinisch auffälligen Bereich auf Skalen, die sich hauptsächlich den internalisierenden Problemen zuordnen lassen.

*Cluster Charakteristika.* Signifikante Gruppenunterschiede ergaben sich für die elterliche psychische Gesundheit (BSI) ($F(4,183) = 5.61$, $p < .001$) und den elterlichen Stress (PSS) ($F(4,183) = 9.84$, $p < .001$). Eltern in der Gruppe der Kinder mit normativen Emotionen und normativem Verhalten ($M = 45.27$, $SD = 15.04$) zeigten signifikant niedrigere Werte im BSI als diejenigen der Gruppen mit ängstlich-vermeidenden Symptomen ($M = 55.78$, $SD = 14.41$) sowie mit multiplen Symptomen ($M = 58.29$, $SD = 13.25$). Hinsichtlich der PSS ergaben sich für die Gruppe mit normativen Emotionen und normativem Verhalten ($M = 34.20$, $SD = 10.43$) signifikant niedrigere Werte als in der Gruppe mit ängstlich-vermeidenden Symptomen ($M = 42.91$, $SD = 10.38$), mit multiplen Symptomen ($M = 47.08$, $SD = 9.26$), mit externalisierenden Symptomen ($M = 42.23$, $SD = 9.50$) sowie mit internalisierenden Symptomen ($M = 45.00$, $SD = 14.54$). Für alle weiteren untersuchten Charakteristika wurden keine signifikanten Gruppenunterschiede gefunden.

*Zusammenhänge mit den Behandlungsergebnissen.* Die Berechnungen, um die Subgruppen hinsichtlich verschiedener Ergebnismaße miteinander zu vergleichen, ergaben – bis auf ein Ergebnismaß – keine signifikanten Unterschiede. Die primären Ergebnisvariablen wurden in allen Gruppen in mindestens 80 % der Fälle erreicht (vgl. Vorgabe MST = 90 %). Für die Veränderungswerte im CNI, in der PSS und in der CBCL wurden ebenfalls keine signifikanten Subgruppenunterschiede entdeckt. Lediglich für den BSI ($F(4,115) = 4.42$, $p = .002$) ergab die einfaktorielle Varianzanalyse signifikante Subgruppenunterschiede mit einer mittleren Effektstärke ($\eta_p^2 = .133$). Die Tukey-post-hoc-Analysen verdeutlichten eine signifikante Verschlechterung der elterlichen Belastung in der Gruppe der Kinder mit internalisierenden Symptomen ($M = -14.57$, $SD = 16.15$) im Vergleich zu den Gruppen mit ängstlich-vermeidenden Symptomen ($M = 7.95$, $SD = 14.65$), mit multiplen Symptomen ($M = 5.79$, $SD = 10.19$), mit externalisierenden Symptomen ($M = 10.25$, $SD = 16.71$) sowie im Vergleich zur normativen Gruppe ($M = 6.78$, $SD = 12.68$).

### 5.3 Differential treatment responses of maltreated and neglected children and adolescents following an evidence-based multisystemic intervention (Studie III)

*Veränderungen der Verhaltensauffälligkeiten, der emotionalen Probleme und der kindlichen Vernachlässigung in den Subgruppen.* Kinder der normativen Gruppe (n = 30) zeigten über die Messzeitpunkte hinweg eine signifikante Reduktion im CBCL-Gesamtwert ($p$ = .036, $n$ = 30) und im Gesamtwert des CNI ($p$ = .012, $n$ = 40). Bei Kindern aus der Gruppe mit externalisierenden Symptomen (n = 39) ergaben sich signifikante Veränderungen für den CBCL-Gesamtwert ($p$ = .012) sowie für die beiden Breitbandskalen internalisierende ($p$ = .012) und externalisierende Probleme ($p$ = .012). Für die Gruppe der Kinder mit multiplen Symptomen (n = 17) wurden signifikant niedrigere Werte für die meisten CBCL-Subskalen gefunden (s. Abbildung 1, Anhang C). Die Gruppe der Kinder mit ängstlich-vermeidenden Symptomen (n = 32) zeigte signifikante Veränderungen im CBCL-Gesamtwert ($p$ = .012), in der internalisierenden Skala ($p$ = .012) und in den Subskalen ‚sozialer Rückzug' ($p$ = .024) sowie ‚Angst/Depression' ($p$ = .012). Auch der Wert im CNI ($p$ = .012, $n$ = 33) reduzierte sich signifikant über die Zeit. Für die Gruppe der Kinder mit internalisierenden Symptomen (n = 11) wurden für keine der untersuchten Maße signifikante Veränderungen zwischen den Messzeitpunkten ermittelt. Die Veränderungen in den CBCL-Subskalen sind in Abbildung 1 des Anhangs C dargestellt. Eine ausführliche Auflistung der Ergebnisse findet sich in den Tabellen 1 und 2 des Anhangs C.

*Verläufe der Subgruppen zwischen t1 und t2.* Zu t2 wurden wie zu t1 fünf Cluster identifiziert (vgl. Kapitel 5.2). Die erste und größte Gruppe (n = 62) bestand aus Kindern mit klinisch unauffälligen Werten am Ende der Behandlung, was auf eine normative Gruppe hinweist. Eine zweite Gruppe (n = 14) zeichnete sich durch klinisch auffällige Werte in den Subskalen ‚körperliche Beschwerden' ($M$ = 67.93, $SD$ = 8.78), ‚Angst/Depression' ($M$ = 64.43, $SD$ = 7.59), ‚soziale Probleme' ($M$ = 66.50, $SD$ = 6.49) und ‚schizoid/zwanghaft' ($M$ = 66.07, $SD$ = 9.89) aus, was als Indikatoren für eine Gruppe mit mehrheitlich internalisierenden Symptomen angesehen werden kann. In der dritten und kleinsten Gruppe (n = 8) zeigten die Kinder klinisch auffällige Werte in der Skala ‚sozialer Rückzug' ($M$ =

72.50, *SD* = 7.80). Dies deutet auf eine Gruppe von Kindern mit sozial zurückgezogenem Verhalten hin. In der vierten Gruppe (n = 25) rangierten die Kinder im klinisch auffälligen Bereich bei den Skalen ‚Aufmerksamkeitsprobleme' (*M* = 64.68, *SD* = 6.65) und ‚aggressives Verhalten' (*M* = 67.36, *SD* = 7.82). Diese Werte können als Indikatoren für eine Gruppe mit Symptomen aus dem Spektrum der Störungen des Sozialverhaltens gelten. Die fünfte Gruppe (n = 19) zeigte klinisch auffällige Werte auf allen Subskalen mit *T*-Werten über 67 in den Skalen ‚Angst/Depression' (*M* = 73.37, *SD* = 5.61), ‚Aufmerksamkeitsprobleme' (*M* = 69.26, *SD* = 9.13) und ‚aggressives Verhalten' (*M* = 69.00, *SD* = 9.26). Damit erfüllen diese Kinder die Kriterien des CBCL-Dysregulationsprofils, das auf schwerwiegende Psychopathologie bei den Kindern dieser Gruppe hinweist.

Ein Vergleich zwischen den zu t1 und zu t2 identifizierten fünf Clustern anhand der Clusterzentroide brachte eine hohe Ähnlichkeit der Cluster hervor, gemessen an den Distanzen der jeweiligen ‚Zwillingscluster' ($0.00 < SS < 0.07$). Die Cluster wiesen somit eine hohe strukturelle Stabilität zwischen den Messzeitpunkten auf.

Die Analyse individueller Entwicklungspfade ergab drei Pfade zwischen drei Clustern, die miteinander zu t1 und t2 korrespondierten. Diese zwischen den Messzeitpunkten stabilen Subgruppen waren die normative Gruppe sowie die Gruppen mit externalisierenden und multiplen Symptomen. Kinder dieser Gruppen gehörten zum Ende der Behandlung zwischen 3,97- und 11,94-mal wahrscheinlicher derselben Gruppe an wie zu Beginn der Behandlung. Ein weiterer Entwicklungspfad konnte zwischen zwei nicht korrespondierenden Clustern identifiziert werden. Die Kinder mit den internalisierenden Symptomen zu t1 wechselten mit einer 8,4-fachen Wahrscheinlichkeit in die Gruppe der Kinder mit sozial zurückgezogenem Verhalten zu t2.

*Subgruppencharakteristika zu t2.* Ein Vergleich der Subgruppen zu t2 bezüglich verschiedener demographischer Variablen ergab keine signifikanten Unterschiede zwischen den Gruppen.

# 6. Zusammenfassende Diskussion

Ziel dieser Dissertation war es zu untersuchen, welche Kinder, Jugendlichen und Familien inwiefern von der MST-CAN profitieren. Dazu wurde vorgeschaltet der allgemeine Nutzen der MST-CAN evaluiert. Anschließend wurden die Charakteristika spezifischer Subgruppen und deren differentielle Behandlungsergebnisse analysiert. Im Folgenden werden die Ergebnisse der einzelnen Studien zusammenfassend diskutiert. Daraufhin erfolgen eine übergeordnete Abschlussdiskussion sowie eine Einordnung der Ergebnisse im Rahmen der Stärken und der Limitationen der Dissertation. Die aus den Ergebnissen abgeleiteten wissenschaftlichen und klinischen Implikationen werden alsdann beschrieben, bevor eine Schlussfolgerung gegeben wird.

## 6.1 Effects of multisystemic therapy for child abuse and neglect on severity of neglect, behavorial and emotional problems, and attachment disorder symptoms in children (Studie I)

Ziel der ersten Studie war die grundlegende Überprüfung des allgemeinen Nutzens der MST-CAN für die behandelten Kinder und Familien im deutschsprachigen Raum. Es wurde untersucht, ob die MST-CAN Familien helfen kann, als Familie zusammen zu bleiben und den Schweregrad kindlicher Vernachlässigung zu reduzieren. Darüber hinaus wurde erfasst, ob Verbesserungen der Verhaltensauffälligkeiten, der emotionalen Probleme sowie der Bindungsauffälligkeiten durch die MST-CAN mit denen von Kindern einer stationären Pflegeeinrichtung vergleichbar sind. In den meisten Familien, die mit der MST-CAN behandelt wurden, lebten am Ende der Behandlung die Kinder zu Hause und gingen zur Schule oder zur Arbeit. Es gab keine erneuten Anzeigen gegen die Eltern und keine neuen Gefährdungsmeldungen. Diese primären Ergebnisvariablen blieben bis 18 Monate nach der Behandlung stabil. Die Ergebnisse korrespondieren mit denen der RCT-Studie von Swenson et al. (2010), in der die Häufigkeit von Fremdplatzierungen und Platzierungswechseln gegenüber einer intensivierten ambulanten Behandlung stärker reduziert werden konnte. Des Weiteren unterstreicht der reduzierte Schweregrad der kindlichen Vernachlässigung mit einer großen Effektstärke in der vorliegenden Studie eines der Hauptziele der MST-CAN,

das darin liegt, das familiäre Umfeld für die Kinder sicherer zu machen. Auch in der Studie von Swenson et al. (2010) konnte eine Reduktion der kindlichen Vernachlässigung durch die MST-CAN belegt werden. Studien legen nahe, dass Elterncharakteristika die stärksten Prädiktoren für das Vorliegen kindlicher Vernachlässigung darstellen (Bauch et al., 2022; Mulder et al., 2018), wodurch die Relevanz, die Elternfaktoren in die Behandlung einzubeziehen, wie es in der MST-CAN der Fall ist, hervorgehoben wird.

Auch die Bindungsauffälligkeiten konnten mit großen Effektstärken bis sechs Monate nach der Behandlung reduziert werden. Da es nur wenige evidenzbasierte Behandlungen für Kinder mit Symptomen einer Bindungsstörung gibt und Interventionen in diesem Bereich bei Kindern und Familien mit einem Risiko der Kindesmisshandlung und/oder -vernachlässigung besonders bedeutsam sind (Cyr & Alink, 2017), sind diese Ergebnisse vielsprechend, müssen jedoch in weiteren Studien repliziert werden.

Kinder aus der Vergleichsgruppe zeigten vor und nach der Behandlung höhere Werte in den Verhaltensauffälligkeiten und bei emotionalen Problemen, in den externalisierenden Symptomen sowie im gehemmten Bindungsverhalten als Kinder in der MST-CAN. Dieses Ergebnis widerspricht der Studie von Lawrence et al. (2006), dass Kinder mit Misshandlungserfahrungen in außerhäuslichen Unterbringungen keine höheren Werte in den Verhaltensauffälligkeiten und emotionalen Problemen zeigen, verglichen mit Kindern, die nicht platziert wurden. Es bleibt unklar, ob die platzierten Kinder höhere Werte hatten, weil sie in ihren Ursprungsfamilien mehr Missbrauch erlebten, oder ob die Platzierung selbst als potenziell traumatische Erfahrung zu den höheren Werten führte (Sethi et al., 2013).

Darüber hinaus ergaben sich signifikante Reduktionen mit mittleren bis hohen Effektstärken für beide Gruppen in allen drei CBCL-Skalen und den RPQ-Skalen zwischen t1 und t2. Dieses Ergebnis liefert Hinweise darauf, dass die MST-CAN eine Alternative zur Fremdplatzierung darstellen kann. Kinder in der MST-CAN erfuhren eine deutlichere Verbesserung der externalisierenden Probleme als Kinder der Vergleichsgruppe. McGuire et al. (2018) vermuten, dass es einen Zusammenhang zwischen der reduzierten Häufigkeit von Misshandlung und den verbesserten externalisierenden Symptomen gibt. Eine theoretische

Einordnung des Gruppenunterschieds erscheint jedoch schwierig, auch im Hinblick auf die Limitationen der Studie (s. Kapitel 6.4). Reduzierte Werte der Bindungsauffälligkeiten in beiden Gruppen können möglicherweise im Rahmen korrigierender Beziehungserfahrungen, einer verbesserten Tagesstruktur und dem Vorhandensein eines sicheren Ortes in beiden Settings eingeordnet werden.

## 6.2 Child and family characteristics in multisystemic therapy for child abuse and neglect (MST-CAN): Are there associations with treatment outcome? (Studie II)

Das Ziel von Studie II war es, die Charakteristika der zur MST-CAN zugewiesenen Familien und ihrer Kinder sowie deren mögliche Zusammenhänge mit den Behandlungsergebnissen zu untersuchen.

Es konnten fünf Subgruppen basierend auf der kindlichen Psychopathologie identifiziert und auf weitergehende gruppenspezifische Charakteristika analysiert werden. Die erste der fünf identifizierten Subgruppen (30 %) war durch Werte im klinisch auffälligen Bereich auf den Skalen ‚sozialer Rückzug' und ‚Angst/Depression' gekennzeichnet, was auf eine Gruppe von Kindern mit ängstlich-vermeidenden Symptomen hindeutet. Die zweite Gruppe (13 %) präsentierte multiple klinisch signifikante Verhaltensauffälligkeiten und emotionale Probleme. Diese Kinder mit multiplen Symptomen zeigten Hinweise auf das Vorliegen schwerwiegender Psychopathologie (Deutz et al., 2020; Dölitzsch et al., 2016). Die Kinder der dritten Gruppe (16 %) waren hauptsächlich durch Werte im klinisch auffälligen Bereich in den externalisierenden Symptomen charakterisiert. Die vierte und größte Gruppe (35 %) zeigte niedrige Werte im unauffälligen Bereich, was auf Kinder mit normativen Emotionen und normativem Verhalten hinweist. In einer fünften Gruppe (6 %) waren die Kinder durch überwiegend klinisch auffällige Werte bei den internalisierenden Symptomen gekennzeichnet. Die Identifikation dieser fünf Subgruppen mit verschiedenen Psychopathologien entsprach dem Ergebnis eines Reviews von Peterson et al. (2019). In diesem wurden ebenfalls eine große Gruppe ohne Symptome, eine kleine Gruppe mit multiplen Erkrankungen und einige qualitativ verschiedene Symptomgruppen, z. B. nur internalisierende, nur externalisierende oder eine spezifische Störung, gefunden. Diese

Gruppen wurden entdeckt, wenn internalisierende und externalisierende Probleme als den Analysen zugrunde gelegte Indikatoren verwendet wurden. Allerdings wurden in dem Review nur Kinder und Jugendliche der Allgemeinbevölkerung eingeschlossen, was die Vergleichbarkeit der Ergebnisse einschränkt.

Die Eltern der Kinder mit ängstlich-vermeidenden und multiplen Symptomen waren im Vergleich zur normativen Gruppe durch höhere Werte in der elterlichen psychischen Belastung gekennzeichnet. Dieses Resultat steht im Einklang mit einer Studie von Chambers und Potter (2009), in der gemäß einer clusteranalytischen Untersuchung in Familien, in denen Vernachlässigung auftrat, hohe klinische Bedürfnisse der Kinder mit hohen klinischen Bedürfnissen der Eltern einhergingen. Entgegen den in der Literatur dokumentierten Zusammenhängen zwischen elterlicher psychischer Belastung und den externalisierenden und den internalisierenden Symptomen der Kinder (Bayer et al., 2006; Everett et al., 2021) konnte in der vorliegenden Studie dafür keine Evidenz gefunden werden.

Auch der elterliche Stress war in allen Gruppen höher als der in der normativen Gruppe. Lorenz et al. (2020) haben in ihrer Untersuchung nur eine Gruppe mit erhöhtem elterlichem Stress identifiziert; allerdings handelte es sich dabei um eine Untersuchung an der Allgemeinbevölkerung. Es konnten keine weiteren Charakteristika ermittelt werden, anhand derer sich die Gruppen voneinander unterschieden. Dies überrascht, da höhere klinische Bedürfnisse häufig mit mehr Risiko- oder Belastungsfaktoren einhergehen. Chambers und Potter (2009) haben beispielsweise ebenfalls höhere Werte in der kindlichen Vernachlässigung und höhere ökonomische Bedürfnisse in einer ähnlichen Gruppe entdeckt.

Im Hinblick auf das zweite Ziel der Studie konnten für die primären Behandlungsergebnisse keine Unterschiede ermittelt werden. Dies kann als Indikator dafür gesehen werden, dass alle Subgruppen gleichermaßen gut von der Behandlung profitiert haben. Auch für die kindliche Vernachlässigung, die Verhaltensauffälligkeiten und die emotionalen Probleme, den elterlichen Stress und die psychische Belastung schienen die Subgruppen gleich erfolgreich auf die MST-CAN anzusprechen, was mit den positiven Ergebnissen auf Eltern- und Kind-Ebene früherer Studien einhergeht (Bauch et al., 2022;

Buderer et al., 2020; Hefti et al., 2020). Lediglich in der Gruppe der Kinder mit internalisierenden Symptomen zeigte sich eine negative Veränderung der elterlichen Belastung. Dafür ist in der Literatur keine stützende Evidenz zu finden. Allerdings betonen Everett et al. (2021) einen Mangel an Interventionsstudien, die Zusammenhänge der elterlichen psychischen Belastung mit den internalisierenden Symptomen der Kinder berücksichtigen. Eine mögliche Erklärung für dieses Ergebnis könnte in einem durch die Behandlung gewachsenen Bewusstsein der Eltern für eigene Belastungen liegen.

### 6.3 Differential treatment responses of maltreated and neglected children and adolescents following an evidence-based multisystemic intervention (Studie III)

Das Ziel der Studie III war es, in einem ersten Schritt die Veränderungen der Verhaltensauffälligkeiten und der emotionalen Probleme sowie der kindlichen Vernachlässigung innerhalb der Subgruppen zu untersuchen. In einem zweiten Schritt sollten die Verläufe der Subgruppen im Sinne von Symptomklassenveränderungen analysiert werden. Vier der fünf Subgruppen haben von der Behandlung profitiert und unterschiedliche Ausprägungen in den Veränderungen der Verhaltensauffälligkeiten und der emotionalen Probleme gezeigt. Bei drei Subgruppen ergab sich eine reduzierte kindliche Vernachlässigung. Beide Ergebnisse stellen heraus, dass die meisten Familien gut auf die MST-CAN ansprachen. Diese Befunde bestätigen differentielle Behandlungsergebnisse für die MST-CAN und befinden sich im Einklang mit Ergebnissen anderer Studien innerhalb und außerhalb des MST-Kontextes, die ebenfalls differentielle Reaktionen bei Kindern und Jugendlichen eines Hochrisiko-Kontextes auf familienbasierte Behandlungen entdeckt haben (Keles et al., 2021; Mertens et al., 2017; Pasalich et al., 2022).

Die Subgruppen, die zu Beginn der Behandlung identifiziert wurden, erschienen auch zum Ende der Behandlung, allerdings mit stärker akzentuierten Symptomen. Dieses Ergebnis deutet daraufhin, dass die Symptomklassen insgesamt, auch wenn sich die Symptomatik reduzieren ließ, über die Zeit hinweg stabil blieben.

Werden die Subgruppen für sich betrachtet, haben die Kinder mit externalisierenden Symptomen am meisten profitiert. Sie zeigten Veränderungen in den meisten Bereichen der

Verhaltensauffälligkeiten und der emotionalen Probleme sowie in der kindlichen Vernachlässigung. Da dieses Ergebnis mit anderen Studien übereinstimmt, die ebenfalls die günstigsten Behandlungsergebnisse für Kinder mit externalisierenden Symptomen hervorheben (Pasalich et al., 2022; Zhang & Slesnick, 2018), könnten dies Indikatoren dafür sein, dass familienbasierte Behandlungen und/oder der aufsuchende Ansatz für diese Kinder besonders von Nutzen sind (Boege et al., 2015; Zhang & Slesnick, 2018). Dennoch blieb die Gruppe in ihrer Symptomklasse konstant, was mit der hohen individuellen Stabilität der Subgruppe über beide Messzeitpunkte hinweg begründet werden konnte.

Kinder mit multiplen Symptomen profitierten hinsichtlich einiger Bereiche der Verhaltensauffälligkeiten und der emotionalen Probleme, aber nicht hinsichtlich der kindlichen Vernachlässigung. Die Symptome blieben am Ende der MST-CAN für diese Kinder im Bereich der Kriterien für schwerwiegende Psychopathologie, was auf eine Gruppe besonders vulnerabler Kinder hinweist. Das Ergebnis wird durch die individuelle Stabilität der Symptomklasse über beide Messzeitpunkte hinweg für diese Subgruppe unterstrichen. Auch Halliday-Boykins et al. (2004) haben in ihrer Studie bei Jugendlichen mit schwerwiegender Psychopathologie ein erhöhtes Risiko dafür entdeckt, nicht von der Behandlung zu profitieren und auf einem hohen Symptomlevel zu bleiben. Dennoch kann dieses Ergebnis als positiv für die MST-CAN gewertet werden. In einer Metaanalyse von Weisz et al. (2017) zur Wirksamkeit psychologischer Behandlungen bei Kindern und Jugendlichen konnten bei Kindern mit multiplen Symptomen lediglich kleine Behandlungseffekte ermittelt werden, die sich nicht signifikant von null unterschieden.

Kinder mit ängstlich-vermeidenden Symptomen profitierten von der MST-CAN bezüglich ihrer spezifischen Symptomatik und der kindlichen Vernachlässigung. In anderen Studien wurden die größten Effekte für Behandlungen von Angststörungen ermittelt (Weisz et al., 2017). Allerdings weisen die untersuchten Stichproben im Vergleich zur vorliegenden Studie Unterschiede auf, was ein möglicher Grund für die inkonsistenten Ergebnisse sein kann.

Für die normative Gruppe war die MST-CAN hinsichtlich der Verhaltensauffälligkeiten und der emotionalen Probleme sowie der kindlichen Vernachlässigung nützlich. Dieses Ergebnis betont das Hauptziel der Behandlung, Kindesmisshandlung und/oder -vernachlässigung zu reduzieren. Die Gruppe wies außerdem eine individuelle Stabilität über beide Messzeitpunkte hinweg auf. Dieses Ergebnis erscheint für diese Gruppe selbsterklärend und betont die Resilienz dieser Kinder zum Zeitpunkt der Behandlung.

Kinder mit internalisierenden Symptomen haben hinsichtlich der untersuchten Ergebnismaße nicht auf die Behandlung angesprochen. Dies liefert mögliche Hinweise für eine ‚Non-Responder'-Gruppe. In der Literatur gibt es allerdings keine stützende Evidenz, dass familienbasierte Behandlungen bei Kindern mit internalisierenden Symptomen nicht wirksam sind. Kinder dieser Gruppe zeigten darüber hinaus ein erhöhtes Risiko, am Ende der Behandlung Symptome des sozialen Rückzugs aufzuweisen. Auch zur Einordnung dieses Ergebnisses fehlen Studien. In Bezug auf die Behandlung mit der MST-CAN kann dieses Ergebnis ein möglicher Indikator dafür sein, dass diese Symptome zu wenig berücksichtigt wurden oder die Kinder Temperamentseigenschaften besitzen, die es erschweren, sie in der Behandlung zu erreichen.

In dieser Studie wurden zum ersten Mal differentielle Behandlungsergebnisse hinsichtlich kindlicher Vernachlässigung untersucht. Möglicherweise liefern die Ergebnisse erste Hinweise dafür, dass Kinder abhängig von ihrer Psychopathologie in unterschiedlicher Weise auf Behandlungsprogramme bei Kindesmisshandlung/-vernachlässigung ansprechen. Zukünftige Studien müssen diese Zusammenhänge weiter untersuchen.

### 6.4 Abschlussdiskussion

Die vorliegende Dissertation ist die erste Forschungsarbeit, die für die MST-CAN die Frage untersucht hat, was für wen wirkt. Damit schließt sich diese Arbeit den drei MST-Studien an, in denen Subgruppen und deren Heterogenität in den Behandlungsergebnissen und -verläufen analysiert wurden (Halliday-Boykins et al., 2004; Keles et al., 2021; Mertens et al., 2017). Obwohl die MST als eines der meistbeforschten Behandlungsprogramme für Kinder und Jugendliche gilt (Hengeller et al., 2011; van der Strouve et al., 2014; Littell et al.,

2021), gibt es dagegen für die MST-CAN nur eine begrenzte Anzahl an Studien. Studie I dieser Dissertation ist die einzige bisher, die die Wirksamkeit der MST-CAN für die behandelten Kinder und Jugendlichen außerhalb der USA untersucht hat und deren Ergebnisse den positiven Nutzen der Behandlung unterstreichen. Da sich die untersuchten Populationen der MST und der MST-CAN hinsichtlich verschiedener Faktoren und insbesondere hinsichtlich der Psychopathologie unterscheiden (nur externalisierende Symptome in der MST vs. gesamte Bandbreite an Symptomen in der MST-CAN), sind weiterführende Vergleiche zwischen den Studien nur begrenzt möglich. Keles et al. (2021) haben für die MST-Ergebnisvariablen, die sich mit denen der MST-CAN teilweise decken (‚das Kind lebt zu Hause', ‚das Kind geht zur Schule/Arbeit'), positive Effekte für die Mehrzahl der behandelten Jugendlichen gefunden. Auch die beiden anderen Studien weisen, trotz Verwendung unterschiedlicher Ergebnismaße, insgesamt für etwa zwei Drittel der behandelten Jugendlichen auf positive Effekte der MST hin (Halliday-Boykins et al., 2004; Mertens et al., 2017). Die Ergebnisse stehen im Einklang mit denen dieser Dissertation in der zwei Drittel der Kinder hinsichtlich der Reduktion in der kindlichen Vernachlässigung und vier Fünftel der Kinder hinsichtlich einer reduzierten Psychopathologie profitierten.

Zur Untersuchung verschiedener Prädiktoren, die ein besseres oder ein schlechteres Behandlungsergebnis vorhersagen, wurden in den Studien unterschiedliche Ansätze verfolgt. Zusammenfassend kann festgehalten werden, dass die Charakteristika Alter, Geschlecht, das elterliche Kompetenzgefühl und deren subjektiv wahrgenommene Handlungsfähigkeit, der prosoziale Einbezug mit Peers, die Hoffnungslosigkeit der Jugendlichen und die geringe Suizidalität in der Prädiktion der Variabilität von Behandlungsergebnissen eine Rolle gespielt haben. Die MST scheint beispielsweise für jüngere Kinder besser zu wirken, jedoch bei vorhandener Hoffnungslosigkeit der Jugendlichen, subjektiv wahrgenommener Handlungsfähigkeit der Eltern und geringerer Suizidalität weniger effektiv zu sein. Dies steht im Kontrast zu den Ergebnissen dieser Dissertation, in der neben der elterlichen psychischen Belastung und dem elterlichen Stress keine weiteren diskriminierenden Faktoren ermittelt werden konnten. Da in dieser

Dissertation andere Charakteristika in die Analysen eingeschlossen wurden, ist nicht auszuschließen, dass es auch für den Behandlungserfolg der MST-CAN weitere diskriminierende Faktoren gibt, die im Rahmen dieser Arbeit nicht untersucht oder entdeckt wurden. Weitere Forschung dazu ist notwendig.

### 6.5 Stärken und Limitationen

Die Dissertation weist Stärken und Limitationen auf, innerhalb derer die Ergebnisse einzuordnen sind.

Als Hauptlimitation muss das Studiendesign genannt werden. Die Evaluation der MST-CAN konnte nicht als randomisierte kontrollierte Studie konzipiert werden. Es wäre unethisch gewesen, im Rahmen einer Wartekontrollgruppe Familien eine Behandlung vorzuenthalten. Mit der Implementierung einer natürlichen Vergleichsgruppe im Sinne eines quasiexperimentellen Designs in der ersten Studie wurde versucht, die Gefahren der internen Validität zu reduzieren (Bortz & Döring, 2013). Jedoch handelt es sich bei selbst selektierten Bedingungen um ein Studiendesign, auf dessen Grundlage nicht auf die Wirkung der Behandlung geschlossen werden kann (Campbell & Stanley, 2015). Es muss von einem Selektionsbias ausgegangen werden, der in der ersten Studie in unterschiedlichen Mittelwerten der beiden Gruppen bereits zum ersten Messzeitpunkt evident wurde. Auf dieser Grundlage kann nicht von gleichen Regressionseffekten in beiden Gruppen ausgegangen werden. Auch verschiedene Reifungsprozesse können aus dem Gruppenunterschied resultieren. Campbell und Stanley (2015) konstatieren, dass die Vergleichsgruppe in solch einem Studiendesign dennoch für die Interpretation herangezogen werden kann, auch wenn kausale Schlussfolgerungen unzulässig sind.

Eine Stärke des quasiexperimentellen Designs dagegen ist eine höhere externe Validität. Die Untersuchung der MST-CAN als ein standardisiertes, manualisiertes Behandlungsprogramm mit einer rigorosen Qualitätssicherung, das in einem naturalistischen Setting mit realen Behandlungsbedingungen implementiert wurde, ergibt eine hohe klinische Repräsentativität und die Ergebnisse lassen sich möglicherweise auf ähnliche ethnische und kulturelle Gruppen übertragen (Weisz et al., 2005).

Eine zweite Limitation der Dissertation liegt darin, dass keine Verblindung vorgenommen werden konnte. Verblindung gilt in der Praxis klinischer Versuche ebenfalls als wesentlicher Grundsatz, um Verzerrungen zu vermeiden (Monaghan et al., 2021). Die Studienteilnehmer:innen sowie die Therapeut:innen der Interventionsgruppe wussten, dass sie an einer Studie teilnehmen. Dies kann ihr Verhalten in einer Weise beeinflusst haben, die die Ergebnisse positiver erscheinen ließ. Die Teilnehmer:innen der Vergleichsgruppe dagegen haben im Rahmen einer Qualitätssicherung die Fragebögen bearbeitet. Infolgedessen kann es zu einer Überschätzung der Studienergebnisse im Sinne des Hawthorne-Effekts und damit zu einer Einschränkung der externen Validität gekommen sein (Sedgwick & Greenwood, 2015).

Die dritte Limitation der Dissertation bezieht sich darauf, dass die Studien nicht nach dem Intention-to-treat-Prinzip (ITT) ausgewertet wurden, d. h., es wurden nur die Ergebnisse derjenigen Studienteilnehmer:innen ausgewertet, die die Behandlung bis zum Ende erhalten haben. Teilnehmende, die die Behandlung abbrachen, gingen nicht in die Auswertung ein. Möglicherweise waren aber gerade diese besonders unzufrieden und zeigten einen geringeren Benefit von der MST-CAN. Nachdem ITT-Prinzip hätten alle Daten der Studienteilnehmer:innen ausgewertet werden müssen, damit die Wirkung der Behandlung nicht überschätzt wird (McCoy, 2017). Allerdings ist festzuhalten, dass die Drop-out-Rate zum zweiten Messzeitpunkt geringer ausfiel, als dies im Kindesschutz zu erwarten wäre (Dawson & Berry, 2002). Dadurch fällt diese Limitation weniger stark ins Gewicht.

Insgesamt kann aufgrund der beschriebenen Verzerrungen eine Abbildung positiverer Effekte der Behandlung vermutet werden, als möglicherweise vorlagen. Eine Quantifizierung der Verzerrung ist allerdings nicht möglich, so dass deren Richtung offen bleibt. Für die vorliegende Dissertation folgt aus den Limitationen, dass alle Ergebnisse vorsichtig zu interpretieren sind und keine kausalen Zusammenhänge als belegt angenommen werden können. Die Ergebnisse müssten durch eine randomisierte kontrollierte Studie bestätigt werden.

### 6.6 Klinische und wissenschaftliche Implikationen

Familien, in denen Kindesmisshandlung und/oder -vernachlässigung auftritt, weisen eine große Bandbreite an Belastungs- und Risikofaktoren auf. Die Folgen von Misshandlung und/oder Vernachlässigung können sich auf den gesamten Lebensweg auswirken und eine Teilhabebeeinträchtigung in verschiedenen Domänen mit sich bringen, z. B. psychische und körperliche Gesundheitsprobleme, delinquentes Verhalten im Erwachsenenalter, Schwierigkeiten in beruflichen und finanziellen Bereichen sowie in der sozialen Einbindung und Beziehungsgestaltung (Schmid et al., 2022). Multimodale systemische Interventionen mit der gesamten Familie sind notwendig, um das Risiko für Kindesmisshandlung und/oder Vernachlässigung zu senken (Mulder et al., 2018) und die damit einhergehenden Langzeitfolgen abzumildern. Behandlungen wie die MST-CAN können für Familien, in denen Kindesmisshandlung und/oder -vernachlässigung auftritt, eine Alternative zu einer Fremdplatzierung darstellen. Eine Fremdplatzierung stellt ein kritisches Lebensereignis dar, das mit bedeutenden Belastungen einhergehen kann. Sie bedeutet eine belastende Trennungserfahrung und die Herausforderung für die Kinder, sich an ein neues Umfeld anzupassen (Zimmermann & Kindler, 2024), aber auch der Weggang eines Familienmitglieds als eine Verlusterfahrung für die gesamte Familie. Alternative Maßnahmen sind daher bedeutsam, um die negativen Folgen einer Fremdplatzierung zu vermeiden.

Die Ergebnisse der vorliegenden Dissertation liefern wertvolle Informationen zu den klinischen Bedürfnissen der Kinder, Jugendlichen und Familien, die mit der MST-CAN behandelt wurden. Auf dieser Grundlage können Interventionen auf die individuellen Bedürfnisse zugeschnitten werden. Es erscheint bedeutsam ‚Non-Responder' früh im Verlauf der Behandlung zu identifizieren und mit geeigneten Maßnahmen zu adressieren. Für Kinder mit multiplen Symptomen – als die vulnerabelste Gruppe und mit dem Risiko einer langfristigen Teilhabebeeinträchtigung – wird zusätzliche Unterstützung möglicherweise bereits während der Behandlung benötigt. Eine Zusammenarbeit mit verschiedenen Hilfsinstitutionen kann nützlich sein, um zusätzliche Unterstützungsmöglichkeiten zu evaluieren und geeignete Anschlusslösungen zu implementieren. Für Kinder mit

internalisierenden Symptomen könnte ein zusätzliches Soziales Kompetenztraining (de Mooij et al., 2020) oder ein stärkerer einzeltherapeutischer Fokus zielführend sein, um das Risiko des sozialen Rückzugs zu reduzieren. Aber auch eine Beendigung der Behandlung und/oder eine Zuweisung zu einer anderen Maßnahme kann in manchen Fällen sinnvoll sein – auch vor dem Hintergrund, begrenzte Ressourcen dort einzusetzen, wo sie am dringendsten gebraucht werden.

Insgesamt sind Breitbandmethoden wie die MST-CAN erforderlich, um eine große Spanne von Kindern und Jugendlichen mit einer heterogenen Symptomatik zu erreichen. Der Versuch eines individuelleren Vorgehens im Rahmen der Behandlung, um den verschiedenen klinischen Bedürfnissen gerecht zu werden, steht jedoch in einem Spannungsverhältnis gegenüber der Manualtreue. Inwiefern ein Zusammenhang der Manualtreue mit dem Behandlungserfolg auch für die MST-CAN besteht, wurde bisher noch nicht erforscht. Studien zur Klärung dieses Zusammenhangs sind nötig.

Für wissenschaftliche Implikationen kann festgehalten werden, dass die Zusammenhänge zwischen Kindesmisshandlung und/oder -vernachlässigung, Risikofaktoren, psychischen Problemen und Behandlungsergebnissen komplex sind und dass weitere Forschung notwendig ist, um diese besser zu verstehen. Gleichzeitig erscheint die Forschung in diesem Kontext jedoch besonders herausfordernd.

Durch die Identifikation von Subgruppen mit unterschiedlichen psychischen Belastungen und klinischen Bedürfnissen unterstreichen die Ergebnisse dieser Dissertation den Wert personenorientierter Studienansätze als zusätzliche Bereicherung komplementär zu variablenorientierten Studien. Damit liefert diese Dissertation bedeutende Erkenntnisse zu einer bis dato bestehenden Forschungslücke in der Literatur. Die Dissertation ist die erste Forschungsarbeit, die heterogene Behandlungsergebnisse für kindliche Vernachlässigung in Abhängigkeit von der kindlichen Psychopathologie entdeckt hat. Weitere Studien sind erforderlich, um diesen Zusammenhang zu klären. Es wäre hilfreich, wenn auch andere Interventionsprogramme in den Bereichen der sozialen Hilfen und der Psychotherapie für

Kinder und Jugendliche die zugewiesenen Familien mit diesen Methoden untersuchen würden, um mehr Informationen in diesem Forschungsbereich zu gewinnen.

### 6.7 Schlussfolgerungen

Die MST-CAN ist eine von wenigen evidenzbasierten Behandlungsprogrammen zur Reduktion von Kindesmisshandlung und/oder -vernachlässigung. Die Ergebnisse der Dissertation liefern bedeutsame Hinweise dafür, dass die Behandlung für viele Familien von Nutzen ist. Eine reduzierte kindliche Vernachlässigung, verringerte Verhaltensauffälligkeiten und emotionale Probleme sowie Bindungsauffälligkeiten lassen unter Beachtung der Limitationen vermuten, dass die Behandlung in der Schweiz wirksam ist. Sie kann helfen, für die Kinder das Umfeld in den Ursprungsfamilien sicherer zu machen und die Langzeitfolgen von Kindesmisshandlung und/oder -vernachlässigung abzumildern, und dabei eine Alternative zu Fremdplatzierungen darstellen. Weiterhin liefern die Studienergebnisse Indikatoren dafür, dass es verschiedene Subgruppen mit unterschiedlichen klinischen Bedürfnissen und heterogenen Behandlungsergebnissen gibt. Kinder und Familien, die wenig oder nicht von der Behandlung profitieren, sollten frühzeitig identifiziert und mit zusätzlichen Interventionen unterstützt werden. Besonders das Vorliegen differentieller Behandlungsergebnisse bei kindlicher Vernachlässigung kann als Vorlage für zukünftige Studien dienen. Der Zugewinn an wertvollen Informationen durch personenorientierte Ansätze wird durch die Ergebnisse unterstrichen, sodass dieser Ansatz für zukünftige Studien empfohlen wird. Diese Ergebnisse können auch für andere manualbasierte Behandlungsprogramme, die Kinder und Jugendliche eines Hochrisiko-Kontextes adressieren, von Interesse sein.

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## Anhang A: Studie I

**Buderer, C.***, Hefti, S.*, Fux, E., Pérez, T., Swenson, C. C., Fürstenau, U., Rhiner, B. & Schmid, M. (2020). Effects of Multisystemic Therapy for Child Abuse and Neglect on severity of neglect, behavioral and emotional problems, and attachment disorder symptoms in children. *Children and Youth Services Review, 119*, 105626. https://doi.org/10.1016/j.childyouth.2020.105626

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# Effects of Multisystemic Therapy for Child Abuse and Neglect on severity of neglect, behavioral and emotional problems, and attachment disorder symptoms in children

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ABSTRACT

Children who experience child abuse and neglect are at high risk for developing emotional and behavioral problems as well as attachment disorder symptoms. Multisystemic Therapy for Child Abuse and Neglect (MST-CAN) is an evidence-based intervention for families experiencing child maltreatment. In a German-speaking environment, we aimed to investigate the effects of MST-CAN on the severity of child neglect, children's emotional and behavioral problems, and children's attachment disorder symptoms, comparing children in MST-CAN with children in residential care (comparison group). A total of 168 families entered MST-CAN between 2011 and 2017 in Switzerland. Effectiveness of the program in this group was compared with a matched comparison group (43 children). Severity of neglect showed a significant reduction after MST-CAN. Children showed significantly less emotional and behavioral problems at the end of MST-CAN and 6 months later. Children in both the MST-CAN group and comparison group showed significant improvements in emotional and behavioral total problems and attachment disorder symptoms over time. Our results showed that MST-CAN made the environment of the family safer by preventing recurrence of neglect. Thus, we conclude that MST-CAN works well in a German-speaking area.

## 1. Introduction

Child physical abuse and neglect (CAN) are the most prevalent child maltreatment types and have a huge impact on society (U.S. Department of Health and Human Services, 2015). Neglect as the most common type of maltreatment (Euser, van Ijzendoorn, Prinzie, & Bakermans-Kranenburg, 2010) is regarded to have an even more severe impact on a child's mental health than physical abuse (Mbagaya, Oburu, & Bakermans-Kranenburg, 2013). In their meta-analysis, Stoltenborgh, Bakermans-Kranenburg, and van Ijzendoorn (2013) reported an overall estimated prevalence of 16.3% for physical neglect and 18.4% for emotional neglect. The consequences of CAN on children's mental health are well documented. International studies (Éthier, Lemelin, & Lacharité, 2004; Hunt, Berger, & Slack, 2017) underline the association between child maltreatment and increased emotional and behavioral problems of these children. Further, robust long-term associations were found with a range of mental disorders such as depressive disorders, anxiety disorders, drug use, and suicide attempts (Norman et al., 2012). In addition, somatic health outcomes in adulthood (Widom, Czaja, Bentley, & Johnson, 2012) as well as social and financial problems and higher crime rates (Copeland et al., 2018) have been reported. Although the link between attachment disorders (AD) and maltreatment is anchored in the diagnostic criteria of ICD-10 and DSM-V (Hornor, 2008), AD is the most understudied disorder in this field. AD are psychiatric illnesses that can develop in children who have problems in emotional attachments to others. AD are characterized by markedly disturbed and developmentally inappropriate social relatedness in most contexts, and are assumed to result from extremes of insufficient care

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(Schröder et al., 2019). No conclusive statements regarding prevalence can be made from research; Minnis et al. (2013) found a prevalence rate of 1.4% in the general population, whereas most studies mainly focused on foster care populations with documented prevalence rates up to 40% (e.g. Zeanah et al., 2004). In clinical and high-risk samples, AD seems to be rare (Zeanah & Smyke, 2008).

### 1.1. Evidence-based interventions in the field of CAN

A few published studies examined the effectiveness of prevention and intervention programs for CAN (MacMillan et al., 2009). In their meta-analysis, Euser et al. (2015) identified a subset of 5 programs among 20 options that yielded effective results in preventing or reducing child maltreatment. The authors reported that programs with a moderate duration (6–12 months) or moderate number of sessions (16–30), with parent training, and programs aimed at reducing (rather than preventing) abuse were effective. In studies with maltreating samples compared to high-risk samples and samples, targeting families with older children, effect sizes were higher. In maltreating families and families with school-age children, both Parent-child Interaction Therapy (PCIT; Chaffin et al., 2004) and MST-CAN (Swenson, Schaeffer, Henggeler, Faldowski, & Mayhew, 2010) proved effective. PCIT showed larger effect sizes, but the study did not assess the reduction of child neglect as an outcome measure (Chaffin et al., 2004). Thus, MST-CAN remains as the only evidence-based intervention program for both neglected and/or physically abused children.

### 1.2. Multisystemic Therapy – Child Abuse and Neglect (MST-CAN)

MST-CAN (Swenson et al., 2010) is an adaptation of the Standard Multisystemic Therapy (MST; Henggeler, Schoenwald, Borduin, Rowland, & Cunningham, 2009), for families with children aged 6 to 17 years who had been exposed to physical abuse and/or neglect. In all cases, the families are allocated to the therapy by Child Protective Services (CPS). Theoretically, MST is based on Bronfenbrenner's theory of social ecology, which states that children are anchored in multiple systems (parents, family, social network; Bronfenbrenner, 1979), and was originally developed for families with youths showing serious antisocial behavior. The core structure in the standard program as well as in MST-CAN is based on nine principles (see Table 1) and an analytic process. The structured analytic process (Henggeler et al., 2009) includes an in-depth assessment of risk factors related to the referral behavior (i.e., physical abuse and/or neglect). Risk factors that are "drivers" of the referral behavior are targeted for treatment and the risk factors examined for each family are those shown to be causal or correlational in the scientific literature across multiple systems including individual, parent, family, and social network (Sidebotham & Heron, 2006; Slep & O'Leary, 2007).

The therapy also entails home-based treatment, flexible working hours, a focus on the social ecology, and a quality assurance system. The adaptation for CAN families with their special needs leads to a reduced caseload for therapists. Moreover, an additional crisis caseworker and collaboration with a psychiatrist are provided. While the standard program lasts for 3 to 5 months, MST-CAN runs 6 to 9 months. Research-based interventions (e.g. anger management, communication and problem solving skills, prolonged exposure, and reinforcement-based therapy for substance misuse) are individually adjusted to the specific problems of the family (Swenson & Schaeffer, 2012). Interventions are based on risk factors that are occurring in the family and on mental health issues that need to be addressed. Table 2 (from Rhiner, Schmid & Fürstenau, 2012) gives an overview of the therapy concept of MST-CAN. For a more detailed description of MST-CAN, see book section of Swenson and Schaeffer (2012).

**Table 1**
The nine principles of Multisystemic Therapy.

| | |
|---|---|
| Principle 1 | The primary purpose of assessment is to understand the fit between the identified problems and their broader systemic context. |
| Principle 2 | Therapeutic contracts emphasize the positive and use systemic strengths as levers for change. |
| Principle 3 | Interventions are designed to promote responsible behaviors and decrease irresponsible behavior among family members. |
| Principle 4 | Interventions are present focuses and action oriented, targeting specific and well-defined problems. |
| Principle 5 | Interventions target sequences of behavior within and between multiple systems that maintain the identified problems. |
| Principle 6 | Interventions are developmentally appropriate and fit the developmental needs of the youth. |
| Principle 7 | Interventions are designed to require daily or weekly effort by family members. |
| Principle 8 | Intervention effectiveness is evaluated continuously from multiple perspectives with providers assuming accountability for overcoming barriers to successful outcomes. |
| Principle 9 | Interventions are designed to promote treatment generalization and long-term maintenance of therapeutic change by empowering caregivers to address family members' needs across multiple systemic contexts. |

### 1.3. Effectiveness of MST-CAN

An early randomized trial established the efficacy of MST in maltreated children and their families (Brunk, Henggeler, & Whelan, 1987). A subsequent randomized effectiveness study (Swenson et al., 2010) showed that MST-CAN is effective as an evidence-based intervention for families exposed to physical abuse and/or neglect experiencing multiple serious clinical needs. In the more recent trial in youths, MST-CAN was more effective than Enhanced Outpatient Treatment (EOT) in reducing internalizing problems (post-traumatic stress disorder, dissociation), behavioral and emotional problems (total score of the Child Behavior Checklist), out-of-home placements, and number of placement changes for youths who had to be placed due to safety issues. Fewer MST-CAN than EOT youths had an incident of re-abuse, but base rates were low, and the difference was not statistically significant. Moreover, caregivers judged MST-CAN to be more effective in reducing parenting behaviors that characterize maltreatment. With regard to social support, MST-CAN

**Table 2**
Therapy concept MST-CAN.

| | |
|---|---|
| **Outcome goals of MST-CAN** | **Treatment capacity** |
| • Prevent re-abuse<br>• Reduction of out-of-home placement or hospitalizations<br>• Or if the resources of parents are overburdened a shared plan for external custody was developed | • 3–4 families per therapist, i.e. 12–16 per team<br>• All family members are involved in the treatment<br>• Duration of the therapy: 6–9 months<br>• Team is accessible 24 hours / 7 days (on-call duty) |
| **Inclusion criteria** | **Exclusion criteria** |
| • Physical abuse and/or neglect within the last 180 days verified by CPS<br>• Target child is aged between 6 and 17<br>• Child is either living with family or there is a plan to reunite rapidly | • Active sexual abuse<br>• Active domestic violence<br>• Active parental psychosis<br>• Children with no available or identified primary caregiver<br>• Children with no planned reunification with their family of origin |
| **Outcome goals for the child** | **Outcome goals for the parents** |
| • Less anxiety symptoms<br>• Less posttraumatic symptoms<br>• Less (internalizing and externalizing) behavioral problems<br>• Better performance in school | • Improvement of psychiatric pathology<br>• Reduce parental physical abuse, aggression and neglect towards the child<br>• Improvement of parenting skills<br>• Strengthen the network around the family (relatives, neighbors, friends) to support the parents in their role |

was significantly more effective in increasing perceived social support from members of the natural and social ecology. A rigorous economic analysis of the findings obtained by Swenson et al. (2010) showed that every U.S. dollar spent on MST-CAN induced savings of $3.31 for participants, taxpayers, and the general society (Dopp, Schaeffer, Swenson, & Powell, 2018).

Additionally, two qualitative studies involving child protection caseworkers were carried out in Australia and Switzerland. The interviewed caseworkers who managed MST-CAN participants reported high rates of satisfaction with the model. In particular, they appreciated the collaborative approach by therapists, feeling of reduced burden, and improved understanding in the handling of highly challenging situations (Hebert, Bor, Swenson, & Boyle, 2014; Hefti, Pérez, Rhiner, Fürstenau, & Schmid, 2019). Consistent with the effectiveness trial, our working group's research showed that parental psychological distress improved during MST-CAN and remained on a lower level after ending the program (Hefti et al., 2018).

Subsequently, the dissemination of MST-CAN has taken place on a national (U.S.A.) and international (Australia, Europe) level, accompanied by research pilots. The first non-English speaking pilots began in 2011 in Switzerland (canton of Thurgau) and the Netherlands, followed by the canton Basel-Stadt (Switzerland) in 2014. Study results confirm MST-CAN as an evidence-based intervention for families who experience child abuse and/or neglect (Euser et al., 2015), also improving parent-child interactions. Furthermore, MST-CAN contains many of the components (e.g. cognitive-behavioral therapy, home visitation, parent training, and family-based interventions) identified in a recently published meta-analysis as being effective in the treatment of child maltreatment (van der Put, Assink, Gubbels, & Boekhout van Solinge, 2018).

### 1.4. Evidence-based interventions for attachment disorder behaviors

So far, no evidence-based interventions exclusively targeting symptoms of attachment disorder have been described (Wright et al., 2015). According to the clinical practice guidelines of the American Academy of Child and Adolescent Psychiatry, recommendations for effective interventions for attachment disorders are derived from the attachment theory, and aim to establish a positive parent-child interaction, improve sensitive responsiveness (the ability to notice a child's signals and behave appropriately in response to the child's signals), alter parents' mental representations, provide social support, and improve maternal mental health and well-being (Zeanah, Chesher, Boris, & AACAP, 2016). For some well-supported interventions that do not specifically focus on reactive attachment disorders but rather aim to improve the child-parent relationship, randomized-controlled trials showed positive effects. Namely, PCIT (Chaffin et al., 2004) and Child-Parent Psychotherapy (CPP; Lieberman, Ghosh, & Van Horn, 2006) proved beneficial.

### 1.5. The present study

The purpose of the present study was to analyze the data of the first 168 families who entered MST-CAN in Switzerland. We aimed to determine the effectiveness of MST-CAN in a non-English-speaking setting and investigated the effects on the severity of child neglect, children's emotional and behavioral problems, and children's attachment disorder symptoms. In a second step, we compared children undergoing MST-CAN in their families with children in residential care. Children in these two groups show very high rates of CAN and, according to Lawrence et al. (2006), comparable rates of emotional and behavioral problems. Thus, we addressed the following questions:

1. Ultimate outcomes of MST-CAN: Can MST-CAN help families stay together? After undergoing MST-CAN, is the child still living at home, is the child going to school, are there any new charges against the parents, and are there any new CPS reports?
2. Does MST-CAN reduce the severity of child neglect?
3. How many children in MST-CAN show emotional and behavioral problems and attachment disorder symptoms at the beginning of treatment? Is there an improvement after intervention with MST-CAN and is this improvement still evident 6 months after terminating the program?
4. Is the reduction of children's emotional and behavioral problems and attachment disorder symptoms in the MST-CAN group comparable with that in a matched comparison group of children in residential care?

## 2. Methods

### 2.1. Study sample

#### 2.1.1. MST-CAN

Families with a report of physical abuse or neglect in the last 180 days were referred to MST-CAN from caseworkers in CPS. Children had to be between 6 and 17 years of age and had to be living at home with the family or in placement with an expected return to their families. Criteria for exclusion were active sexual abuse, active partner violence in the absence of child physical abuse and neglect, actively suicidal, homicidal, and psychotic children/youths and children/youths with autism spectrum disorder level 2 or 3 (according to DSM-V).

As illustrated in Fig. 1, 168 children and their families started MST-CAN between July 2011 and November 2017 in the cantons of Thurgau and Basel-Stadt, Switzerland. Ten families terminated the MST-CAN program due to reasons not related to the therapy (such as missing cost coverage or moving away). Of the remaining 158 families, 11 (7.0%) were discharged due to lack of engagement. In 4 (2.5%) cases, the child had to be placed out-of-home. At the time of this analysis, 21 families were still in the MST-CAN program, while 122 (77.2%) families had completed MST-CAN in the described time period.

All referred families who effectively started MST-CAN ($n = 158$) were contacted and invited to participate in the study. A total of 132 (83.5%) families agreed to take part in the evaluation. At the end of therapy, 88 families were available for the analysis, and 60 families completed the follow-up questionnaires 6 months later. Reasons for non-participation in the study were that parents refused to give their informed consent, had language barriers, had moved away after the therapy, were not reachable for follow-up interviews, or were too distrustful about the confidentiality of the study.

#### 2.1.2. Comparison group

The comparison group was recruited from 38 residential care institutions (see Fig. 1). These institutions were all located in regions where there were no intensive out-patient treatments (such as MST-CAN) for children who experienced child maltreatment available, and therefore, out-of-home-placement was often the only alternative. All 38 institutions have used the EQUALS program as a quality assurance instrument (outcome-oriented quality assurance in residential care institutions; Schröder, Jenkel, & Schmid, 2013). EQUALS measures outcome-oriented goals and additionally uses psychometric questionnaires. The 38 residential care institutions selected work on very high standards and document the quality of their work regularly. All children, adolescents, and staff in these 38 residential care institutions were invited to fill out different questionnaires. Participants and their parents or legal guardians gave their written informed consent. The EQUALS sample included 1412 children and adolescents in residential care with an age range between 3 and 21 years ($M = 14.80$, $SD = 2.75$; 47.5% female). For the matching of the present study, we first used the data of the 1412 children and adolescents and checked whether the Child Behavior Checklist (CBCL; Workgroup German Version of the Child Behavior Checklist, 1998) and the Relationship Problem Questionnaire (RPQ; Minnis et al., 2007; German version: Kleinrahm, Ziegenhain, & Schmid, 2009) were filled out on two different occasions (T1, T2). This

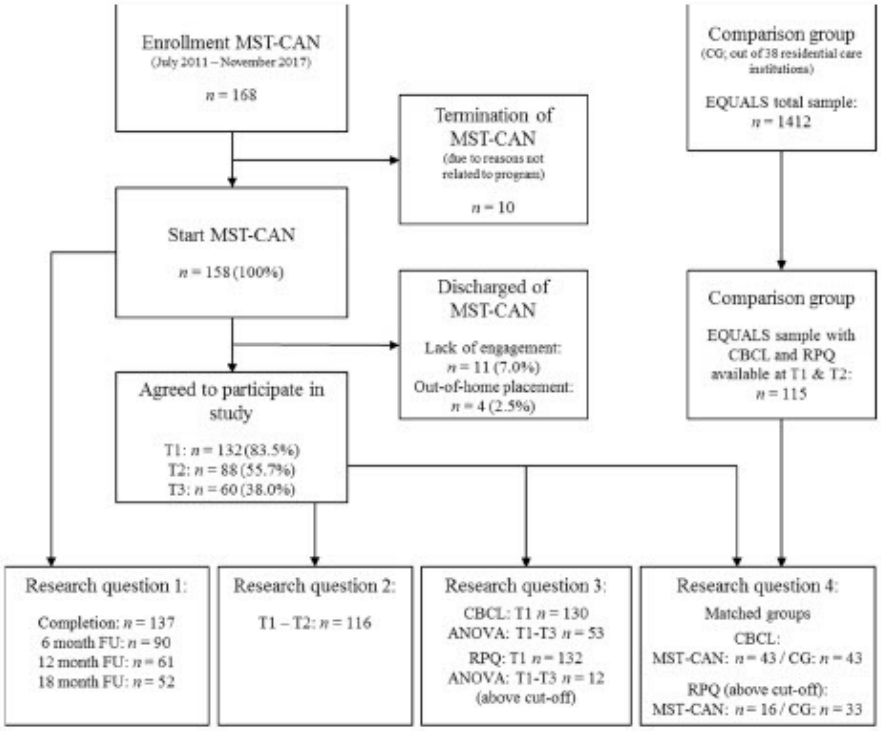


**Fig. 1. Flow chart of participation and analysis.**

resulted in a sample of 115 children and adolescents for whom both CBCL and RPQ data at T1 and T2 were available. This sample then served as a basis for matching with the data of those 70 families in the MST-CAN program who had completed the CBCL and RPQ before and after completion of treatment. The two groups were matched according to age (+/−3 months) and gender. We matched 43 children (24 boys and 19 girls) from each of the two groups. Thereby, each child from the comparison group had the same gender and age ($M = 10.91$, $SD = 2.541$) as the child in the MST-CAN group ($M = 10.95$, $SD = 2.597$).

### 2.2. Procedure

The study was approved by the Ethics Committees Ostschweiz (EKOS) and Northwest/Central Switzerland (EKNZ). Oral informed consent from under-aged participants and written informed consent from legal guardians was obtained before any data were collected.

#### 2.2.1. MST-CAN

To assess the ultimate outcomes (i.e. child is living at home, child is attending school, no new charges against the parent, and no new report at CPS) the families were contacted per phone upon completion of MST-CAN and again 6, 12, and 18 months subsequently. Recording these four ultimate outcomes is part of the standardized mandatory quality assessment requested by MST Services.

To assess the severity of neglect, the CPS caseworkers were interviewed by phone at the beginning of MST-CAN and after ending it. They also reported the case characteristics and type and severity of maltreatment experienced by the children. The decision against assessing neglect via self-report of the parents strengthens the present study because parents' self-reports have the potential limitation of parents answering in a socially desirable way and therefore underreporting neglect.

To measure aspects of child mental health, the index parent (i.e. parent who presented the main risk to the child) and the child who was subjected to abuse and/or neglect completed several questionnaires at the start (baseline measure: T1) and at the end of MST-CAN (T2), as well as 6 months after treatment with MST-CAN has ended (T3). Completion of the questionnaires took place at the family's home or at the child and adolescent psychiatric clinic that operates MST-CAN. This paper reports the result of the CBCL and the RPQ.

#### 2.2.2. Comparison group

Children in residential care institutions and those social workers who had the function of the primary caregiver completed several computer-based questionnaires for the children or adolescents in care with the EQUALS program at two points. Here, we report the results of the CBCL and the RPQ. The average time span between T1 and T2 was 16.33 months ($SD = 11.39$) for the CBCL and it was 13.14 months ($SD = 6.17$) for the RPQ. The data collection for T1 and T2 was associated with a great effort for the residential care institutions. Data collection of a third point in time could not be realized with the limited resources of the study.

### 2.3. Interventions

#### 2.3.1. MST-CAN

MST-CAN is a home-based therapeutic model (Swenson et al., 2010) using the core components of standard MST (e.g. the nine MST-principles, the use of evidence-based interventions, home-based service delivery, flexible hours, an on-call rotation service, etc.; Henggeler et al., 2009) as well as several adaptations for maltreated and neglected children and their families (e.g. safety plan, abuse clarification process, treatment for PTSD or substance abuse, a part-time psychiatrist, longer treatment duration, etc.). The focus lies on improving the factors that trigger and maintain the high risk of CAN. In principle, MST-CAN uses evidence-based clinical interventions (e.g. behavioral and cognitive-behavioral therapies, structural/strategic family therapy). Each MST-CAN team in Switzerland consisted of a supervisor overseeing the

work, four therapists, and a crisis caseworker. In addition, a MST-trained psychiatrist was available to offer pharmacotherapy for children if indicated. At the beginning, all MST-CAN therapists underwent a 5-day MST training, a 4-day MST-CAN training, and a 4-day trauma therapy training. Booster training was provided every 3 months to ensure treatment fidelity. MST-CAN therapists were supervised at least 2 hours per week by the team-leader and received an additional hour consultation per week from an MST-CAN expert ensuring adherence to treatment principles. The caseload per therapist was 3 to 4 families. Clinical services were generally provided at the family's home. Frequency of sessions ranged from one to four or five times a week depending on the family's needs. An on-call service (24 hours/7 days per week) was provided by the therapists to manage crises. The usual duration of MST-CAN was 6 to 9 months, and the whole family was included in the program. Therefore, MST-CAN resembled an inpatient rather than outpatient therapy in terms of intensity. Adherence to the therapeutic principles was measured using the Therapy Adherence Measure - Child Abuse & Neglect (TAM-CAN-R; Swenson, 2010) instrument. Both MST-CAN teams in Switzerland reached the TAM-CAN-R target mean value of 0.61 (MST-CAN Thurgau: $M = 0.70$, MST-CAN Basel: $M = 0.61$; for detailed information about quality assurance and therapy adherence, see supplemental file of Hefti et al., 2018).

#### 2.3.2. Comparison group

Residential care treatment took place in institutions with an official registration of the Swiss Federal Office of Justice (Bundesamt für Justiz, BJ). The BJ approves institutions with at least one third of children and youths aged between 7 and 25 years who committed a criminal offense and/or exhibit significantly disrupted social behavior (Bundesamt für Justiz, 2014). Furthermore, official BJ-registration of these institutions requires certain quality standards, e.g. written description of their concept, appropriate personnel budget in line with the case severity of the referred children and youths, as well as high-quality care staff of whom at least 75% are qualified carers. The participating institutions had an agreement with psychiatric institutions for interdisciplinary collaboration, which guaranteed the children and youths low-threshold access for evidence-based psychotherapy. Overall, 10 (23.3%) children and youths in the comparison group underwent an outpatient psychiatric or psychotherapeutic treatment at T1. About half of the children and adolescents (51.2%, $n = 22$) had received psychiatric or psychotherapeutic treatment at least once in their lives. Nineteen (44.2%) children or youths had received outpatient psychiatric treatment and 5 (11.6%) children or youths had experienced inpatient psychiatric treatment. In addition, the lifetime prevalence rates of CAN among the children in the comparison group was as follows: 9.3% ($n = 4$) for physical abuse, 9.3% ($n = 4$) for emotional abuse, 9.3% ($n = 4$) for sexual abuse, 32.6% ($n = 14$) for physical neglect and 25.6% ($n = 11$) for emotional neglect (measured with the German version of the Childhood Trauma Questionnaire CTQ; Klinitzke, Romppel, Hauser, Brahler, & Glaesmer, 2012). For 27 (62.8%) children, prevalence rates for abuse and neglect were not available.

### 2.4. Measures

#### 2.4.1. Ultimate outcomes MST-CAN

The primary treatment outcomes were defined as follows: the child is living at home, the child is going to school, there are no new charges against the parents, and there is no new report to CPS. For the first outcome, the parents were asked during the phone interview if the child currently lived at home or with extended family members, or lived in a stable environment that best meet the needs of the child while providing a positive permanency plan. For the second outcome, the parents were asked whether their child attended school or vocational training or had a paying job for at least 20 hours per week. Furthermore, the parents or caregivers confirmed that there had been no new charges against the parents and that they had not been arrested during or after MST-CAN. Moreover, the parents or caregivers had to confirm that there had been no new CPS report of maltreatment during or after MST-CAN.

#### 2.4.2. Neglect

The Ontario Child Neglect Index (CNI; Trocmé, 1996) is a questionnaire to specify the type and severity of neglect consisting of six neglect scales (i.e. supervision, nutrition, clothing and hygiene, physical health care, mental health care, and development/educational care). These six scales are rated on a four- to five-level scale by trained child welfare professionals. The CNI was designed to give professionals and researchers in the field of child protection and welfare a validated and convenient instrument to determine the type and severity of neglect. The CNI uses a simple scoring model that merges the score on the scale receiving the highest rating with an age score (score ranging from 0 to 80). This score is interpreted as a rating of severity rather than as a categorical measure of neglect versus no neglect. Trocmé (1996) reports test–retest reliability between 0.83 and 0.91 (weighted kappa) for each scale and an interrater reliability score from 0.88 to 0.91 (Pearson $r$) for the global CNI score. To examine concurrent validity, the CNI scales were compared to the maltreatment classifications of the National Incidence Study child protection worker survey form (NIS; U.S. Department of Health and Human Services, 1988) and the Child Well-Being neglect scales (CWB; Magura & Moses, 1986), and were significantly related to both (Trocmé, 1996). In the present study, the unpublished German translation of the CNI was used (Pérez, Schmid & Hefti, 2017). The original English questionnaire was translated and back translated by us. Nico Trocmé confirmed the equivalence of the original version and the translated version. In agreement with the author, we have made a few minor cultural adjustments to the German version of the CNI (for example deletion of the abbreviations for the laws in Canada).

#### 2.4.3. Childhood emotional and behavioral problems

Emotional and behavioral problems of the children were assessed using the German version of the Child Behavior Checklist (CBCL/4 - 18; Workgroup German Version of the Child Behavior Checklist, 1998). It consists of 113 items with possible responses on a 3-level scale. The items can be assigned to 8 subscales (i.e. social withdrawal, somatic complaints, anxiety/depression, social problems, thought problems, attention problems, delinquent behavior, and aggressive behavior), which are summarized in two broad band scales (internalizing and externalizing) and a total score. Internalizing problems of childhood are broadly defined as problems that occur within the child like anxiety or depression. Externalizing problems in childhood can be broadly defined as disorders characterized by behaviors directed outwards and typically occur in interaction with another person (delinquent or aggressive behavior). For clinical purposes raw scores are converted into $T$-scores. For the three scales of total problems, internalizing problems, and externalizing problems, scores between 60 and 63 are considered as a borderline clinical range, and 64 or more are considered as the clinical range. The German version shows good psychometric characteristics (Walter & Remschmidt, 1999): retest-reliability, internal consistency, and discriminative validity for total problems, internalizing problems, and externalizing problems showed scores above 0.70. In our sample, reliability for CBCL total problems was very good, with Cronbach's $\alpha$ at 0.94.

#### 2.4.4. Attachment disorder symptoms

Attachment disorder symptoms were assessed with the Relationship Problems Questionnaire (RPQ; Minnis, Rabe-Hesketh, & Wolkind, 2002; Minnis et al., 2007). The RPQ is an economical caregiver-report screening questionnaire which assesses relationship problems and behaviors that typically constitute symptoms of an attachment disorder and enables to differentiate between the disinhibited and inhibited subtypes. The four possible responses can be scored on a scale ranging from 0 to 3, and the sum of the 10 items yields the RPQ total score. In the

current study, we used the German 10-items version of the RPQ (Kleinrahm, Ziegenhain, & Schmid, 2009), which shows high internal consistencies for the RPQ total score (Cronbach's $\alpha = 0.81$) as well as for both of the subscales of disinhibited (Cronbach's $\alpha = 0.86$) and inhibited (Cronbach's $\alpha = 0.74$) attachment behavior (Pérez, Di Gallo, Schmeck, & Schmid, 2011). An RPQ total score higher than 5 of 30 possible value points indicates the presence of attachment disorder (Schröder et al., 2019). The RPQ was used as a dimensional measure of relationship problems not as a screening tool for attachment disorder like reactive attachment disorder (ICD-11 6B44) and disinhibited social engagement disorder (ICD-11 6B45), because such relationship problems are very relevant in our sample and the RPQ is a sufficient, very economical questionnaire to assess these symptoms and their reduction during treatment.

### 2.5. Data analysis

All analyses were conducted using the IBM SPSS Statistics 24. We first calculated descriptive statistics for the whole MST-CAN sample. Subsequently, frequencies were calculated for the ultimate outcomes to answer the first research question. To investigate the second research question regarding the differences in the severity of child neglect before and after MST-CAN, we used a paired-samples *t*-test. Pearson's correlation coefficient *r* was used to calculate the effect size. Effect sizes of $r = 0.10$ were considered small, $r = 0.30$ medium, and $r = 0.50$ large (Cohen, 1988). The third research question concerning the number of children showing emotional and behavioral problems and attachment disorder symptoms at the beginning of MST-CAN was assessed for the three CBCL scales (i.e. total problems, internalizing problems, and externalizing problems), and for the three RPQ scales (i.e. total score, disinhibited attachment behavior, and inhibited attachment behavior). To investigate the alleviation of children's emotional and behavioral problems over all three time points (T1, T2, T3), repeated measures analyses of variance (ANOVAs) were conducted individually for CBCL total problems, CBCL internalizing problems, and CBCL externalizing problems. The ANOVA included the CBCL total problems, CBCL internalizing problems, and CBCL externalizing problems as dependent variables, and the three time points (T1, T2, T3) as within-subject repeated factors. No control variables were entered in the analyses. The three CBCL scales were distributed normally at all three assessment points. For post-hoc analyses, Bonferroni correction was applied. For the repeated measures ANOVAs, Cohen's *f* is reported as effect size, where effect sizes of 0.10, 0.25, and 0.40 are considered small, medium, and large, respectively (Cohen, 1988). Because the RPQ total score and both subscales were not distributed normally over the three assessment points, Friedman's ANOVA was carried out for all children who had RPQ total scores above the cutoff of 5 at T1 and RPQ scores at T1, T2, and T3 were available. For post-hoc analyses, Wilcoxon signed-rank tests were applied. For Friedman's ANOVAs, Pearson's correlation coefficient *r* is reported as effect size, where effect sizes of 0.10, 0.30, and 0.50 are considered small, medium, and large, respectively (Cohen, 1992). A two-factor ANOVA for all total scales and subscales of the CBCL and RPQ was conducted to compare the MST-CAN sample with the matched comparison group. Cohen's *d* is reported as effect size, where an effect size of 0.20 is considered small, 0.50 medium, and 0.80 large (Cohen, 1988).

## 3. Results

### 3.1. Baseline characteristics

#### 3.1.1. MST-CAN

Participants were 158 consecutively referred children and their families who enrolled in the MST-CAN program in Thurgau and Basel-Stadt, Switzerland, between 2011 and 2017. The sample consisted of 73 (46.2%) girls and 85 (53.8%) boys with a mean age of 9.36 ($SD$ = 3.22) years. Mean treatment duration was 247.82 ($SD$ = 48.41) days (including non-completers: $M = 230.82$ days; $SD = 68.11$). According to case workers in CPS 65 (41.1%) of the children had experienced more than one type of maltreatment. In total 84 (53.2%) children had experienced neglect, 43 (27.2%) children had been physically abused, 76 (48.1%) children had been emotionally abused, and 3 (1.9%) children had been sexually abused (not by the caregiver that participated in MST-CAN). In 61 (38.6%) families, there had already been a report to CPS prior to the one that led to the intervention with MST-CAN. There was a history of partner violence in 82 (51.9%) families and a history of substance abuse in 56 (35.4%) families.

#### 3.1.2. Comparison group

Participants in the comparison group were 43 children in residential care in different institutions in Switzerland. The comparison group consisted of 19 (44.2%) girls and 24 (55.8%) boys with a mean age of 11.08 ($SD$ = 2.50) years. Of the 43 children in residential care, 37 (86.0%) lived in an educational child care institution, 3 (7.0%) children lived in a home with restraint of liberty, and 3 (7.0%) children lived in a residential school.

For the children in the comparison group, an average CBCL total *T*-score of 67.86 ($SD = 9.35$, $n = 43$), which was above the cutoff score for the clinical range, was reported at T1 (see Table 6). For the CBCL externalizing problems, the average score was 66.33 ($SD$ = 12.02), whereas for the CBCL internalizing problems, the mean was 64.37 ($SD$ = 8.95). Thus, these children showed notably higher *T*-scores in all three CBCL scales than the general population.

At T1, a mean RPQ total score of 6.67 ($SD$ = 4.57, $n$ = 43) was reported for the comparison group (see Table 6). This value was above the cutoff score for attachment disorder symptoms. For the RPQ subscales of disinhibited and inhibited attachment behavior, the means were 2.79 ($SD = 2.90$) and 3.88 ($SD = 2.71$), respectively. For 22 (51.2%) children of the comparison group, a cutoff above 5 was reported.

### 3.2. Ultimate outcomes

The ultimate outcomes for MST-CAN showed that at the end of treatment ($n = 137$), 126 (92.0%) children were living at home, and 134 (97.8%) were going to school or were working. A total of 124 (90.5%) parents had no new charges brought against them, and in 115 (83.9%) cases, there was no new CPS report. These results were still stable at 18 months after completion of MST-CAN. Table 3 shows the results for the 6-month, 12-month, and 18-month follow-up assessment. It is important to emphasize that 18 months ($n$ = 52) after MST-CAN treatment has ended 49 (94.2%) children were living at home, and 50 (96.2%) children were going to school. Moreover, 51 (98.1%) parents had no new charges against them, and in 51 (98.1%) cases, there was no new CPS report. The comparison of the responders with the non-responders of the ultimate outcomes at 18 month follow-up showed no significant differences regarding age ($t(131) = -0.984$, $p = .327$) or sex of children ($\chi^2(1) =$

**Table 3**
Ultimate outcome variables after completion of MST-CAN and 6, 12, and 18 months later.

| | MST-CAN completion ($n$ = 137) | 6 month FU ($n$ = 90) | 12 month FU ($n$ = 61) | 18 month FU ($n$ = 52) |
|---|---|---|---|---|
| **Child living at home** | 126 (92.0%) | 86 (95.6%) | 58 (95.1%) | 49 (94.2%) |
| **Child is attending school** | 134 (97.8%) | 89 (98.9%) | 61 (100%) | 50 (96.2%) |
| **No new charges against parents** | 124 (90.5%) | 87 (96.7%) | 59 (96.7%) | 51 (98.1%) |
| **No new CPS-report for maltreatment** | 115 (83.9%) | 88 (97.8%) | 55 (90.2%) | 51 (98.1%) |

*Note.* FU = follow-up, CPS = Child Protection Services.

0.728, $p = .394$). Further, there were no significant differences regarding scores at T1 of CNI ($t(119) = 0.183$, $p = .855$), CBCL total problems ($t(129) = 0.349$, $p = .727$), CBCL internalizing problems ($t(129) = 0.222$, $p = .824$), CBCL externalizing problems ($t(129) = 0.445$, $p = .657$), RPQ total score ($t(129) = 1.055$, $p = .293$), RPQ disinhibited score ($t(129) = 1.816$, $p = .072$), or RPQ inhibited score ($t(129) = -0.465$, $p = .643$).

### 3.3. Severity of child neglect

A paired-samples *t*-test was conducted to analyze the difference in severity of child neglect (CNI scores) at the beginning and the end of MST-CAN. CNI scores significantly decreased between T1 ($M = 45.99$, $SD = 17.47$) and T2 ($M = 28.49$, $SD = 20.26$; $t = 9.568$, $p < 0.001$, $n = 116$). The effect size was large ($r = 0.666$).

### 3.4. Emotional and behavioral problems and attachment disorder symptoms

#### 3.4.1. Emotional and behavioral problems

Parents reported an average CBCL total *T*-score of 63.72 at the beginning of MST-CAN ($SD = 10.54$, $n = 130$), which was slightly below the cutoff score for the clinical range (64). This indicated that children in MST-CAN showed notably higher CBCL total *T*-scores at T1 than the general population. For 21 (15.9%) children, the total score of the CBCL was considered subclinical, and 70 (53.0%) children had scores in the clinical range. At the beginning of MST-CAN, 62 (47.0%) children showed a clinically significant score for internalizing problems, and 65 (49.2%) children were considered as having externalizing problems in the clinical range. Separate repeated measures ANOVAs were conducted to analyze the change in emotional and behavioral problems over all three assessment points (T1, T2, and T3). For CBCL total problems, there was a significant effect over time ($F(1.83, 95.23) = 18.34$, $p < 0.001$, $\eta^2 = 0.26$; see Table 4). Therefore, emotional and behavioral problems in children decreased significantly over time. The effect size was large ($f = 0.594$). Bonferroni-corrected post-hoc analyses showed that CBCL total problems (*T*-score) was significantly higher at T1 ($M = 64.53$, $SD = 10.83$) than at T2 ($M = 59.32$, $SD = 11.57$; $p < 0.001$) and at T3 ($M = 59.13$, $SD = 12.65$; $p < 0.001$). The difference between T2 and T3 was not significant ($p = 1.000$). The scores of the CBCL subscales internalizing problems ($F(2, 104) = 9.72$, $p < 0.001$, $\eta^2 = 0.16$) and externalizing problems ($F(2, 104) = 14.55$, $p < 0.001$, $\eta^2 = 0.22$) also decreased significantly over time. For both CBCL subscales, effect sizes were large (internalizing problems: $f = 0.432$; externalizing problems: $f = 0.530$). For the subscale CBCL internalizing problems, Bonferroni-corrected post-hoc analysis revealed a significant decrease between T1 ($M = 62.30$, $SD = 11.28$) and T2 ($M = 57.68$, $SD = 11.19$; $p = .003$) and also between T1 and T3 ($M = 57.17$, $SD = 12.86$; $p = .002$). The difference T2-T3 was not significant for CBCL internalizing problems ($p = 1.000$). For CBCL externalizing problems, post-hoc analysis showed a significant decrease between T1 ($M = 62.17$, $SD = 11.43$) and T2 ($M = 57.79$, $SD = 10.73$; $p < 0.001$) and between T1 and T3 ($M = 57.64$, $SD = 12.32$; $p < 0.001$). The improvements in the CBCL total score and subscale scores remained stable at T3.

#### 3.4.2. Attachment disorder symptoms

At T1, 25 (18.9%) children in MST-CAN ($n = 132$) showed a RPQ total score above the cutoff and therefore showed symptoms of attachment disorder. Parents ($n = 130$) reported an average RPQ total score of 3.06 ($SD = 3.43$). The Friedman's ANOVA for children with an RPQ total score above the cutoff at T1 revealed no significant change of RPQ total score over time ($\chi^2(2) = 3.68$, $p = .159$; Table 5). Although the overall effect was not significant, Bonferroni-corrected post-hoc analysis showed that the decrease of attachment disorder symptoms was significant between T1 ($M = 8.92$, $SD = 2.47$) and T3 ($M = 5.92$, $SD = 5.37$; $p = .050$) with a large effect size ($r = 0.544$). The differences T1-T2 ($p = .055$) and T2-T3 ($p = .171$) were not significant for RPQ total score. Additionally, there was no significant decrease for the subscale of disinhibited attachment behavior ($\chi^2(2) = 5.90$, $p = .052$). Here, the Bonferroni-corrected post-hoc analysis showed a significant decrease between T2 ($M = 5.33$, $SD = 3.42$) and T3 ($M = 3.83$, $SD = 2.95$; $p = .028$) with a large effect size ($r = 0.635$). For the disinhibited score, the differences T1-T2 ($p = .550$) and T1-T3 ($p = .142$) were not significant. For the subscale of inhibited attachment behavior, no significant decrease was found ($\chi^2(2) = 5.71$, $p = .058$) over time. However, Bonferroni-corrected post-hoc analysis revealed a significant decrease between T1 ($M = 3.25$, $SD = 1.96$) and T2 ($M = 2.08$, $SD = 1.51$; $p = .028$) with a large effect size ($r = 0.532$). The differences T1-T3 ($p = .106$) and T2-T3 ($p = .799$) were not significant for the inhibited score.

**Table 5**
Friedman's test conducted for children's attachment disorder symptoms (children with an RPQ total score above cut-off at T1; RPQ total score and subscale scores).

| Variables | T1 *M* (*SD*) | T2 *M* (*SD*) | T3 *M* (*SD*) | $\chi^2$ | *p* | *df* |
|---|---|---|---|---|---|---|
| RPQ total | 8.92 (2.47) | 7.33 4.50) | 5.92 (5.37) | 3.68 | .159 | 2 |
| RPQ disinhibited | 5.58 (2.84) | 5.33 (3.42) | 3.83 (2.95) | 5.90 | .052 | 2 |
| RPQ inhibited | 3.25 (1.96) | 2.08 (1.51) | 2.08 (3.00) | 5.71 | .058 | 2 |

*Note.* RPQ = Relationship Problems Questionnaire, T-score. $n = 12$. *M* = Mean, *SD* = standard deviation, *df* = degree of freedom. T1 = start of MST-CAN, T2 = after MST-CAN, T3 = 6-month follow-up.

**Table 4**
Repeated measures ANOVAs for children's emotional and behavioral problems (CBCL total score and subscale scores).

| Variables | T1 *M* (*SD*) | T2 *M* (*SD*) | T3 *M* (*SD*) | *F* | *df* | Effect size Cohen's *f* |
|---|---|---|---|---|---|---|
| CBCL total[a] | 64.53 (10.83) | 59.32 (11.57) | 59.13 (12.65) | 18.34*** | 1.83, 95.23 | 0.594 |
| CBCL internalizing | 62.30 (11.28) | 57.68 (11.19) | 57.17 (12.86) | 9.72*** | 2, 104 | 0.432 |
| CBCL externalizing | 62.17 (11.43) | 57.79 (10.73) | 57.64 (12.32) | 14.55*** | 2, 104 | 0.530 |

*Note.* CBCL = Child Behavior Checklist, T-score. $n = 53$. *M* = Mean, *SD* = standard deviation, *df* = degree of freedom. T1 = start of MST-CAN, T2 = after MST-CAN, T3 = 6-month follow-up.
[a]Sphericity was violated, Huynh-Feldt correction reported.
*** = $p < .001$.

**Table 6**
Descriptive analysis and mixed model for repeated measures of CBCL and RPQ in the MST-CAN group and comparison group.

| Measure | T1 | | T2 | | Mixed model for repeated measures | | |
|---|---|---|---|---|---|---|---|
| | MST-CAN | CG | MST-CAN | CG | Effect (G) | Effect (T) | InteractionG × T |
| | *M*(*SD*) | *M*(*SD*) | *M*(*SD*) | *M*(*SD*) | *F*(*d*) | *F*(*d*) | *F*(*d*) |
| CBCL[a] | | | | | | | |
| CBCL total | 64.16 | 67.86 | 57.77 | 64.88 | 6.85* | 28.27*** | 3.76 |
| | (11.20) | (9.35) | (12.06) | (8.70) | (0.57) | (1.16) | (0.42) |
| CBCL intern. | 62.67 | 64.37 | 56.67 | 60.81 | 1.96 | 20.32*** | 1.33 |
| | (12.72) | (8.95) | (12.63) | (8.23) | (0.31) | (0.98) | (0.25) |
| CBCL extern. | 61.77 | 66.33 | 55.65 | 64.49 | 10.00** | 20.48*** | 5.93* |
| | (10.42) | (12.02) | (10.10) | (9.86) | (0.69) | (0.99) | (0.53) |
| RPQ[b] | | | | | | | |
| RPQ total | 3.02 | 6.67 | 2.30 | 4.72 | 2.18 | 15.34*** | 0.24 |
| | (3.41) | (4.57) | (3.45) | (3.56) | (0.43) | (1.14) | (0.14) |
| RPQ disinhib. | 1.42 | 2.79 | 1.28 | 1.98 | 0.06 | 4.63* | 0.31 |
| | (2.24) | (2.90) | (2.15) | (2.49) | (0.07) | (0.63) | (0.16) |
| RPQ inhib. | 1.58 | 3.88 | 1.00 | 2.74 | 7.74** | 13.82** | 0.06 |
| | (1.92) | (2.71) | (1.66) | (2.56) | (0.81) | (1.08) | (0.07) |

*Note.* CG = Comparison group; CBCL = Child Behavior Checklist; intern. = internalizing; extern. = externalizing RPQ = Relationship Problems Questionnaire; disinhib. = disinhibited; inhib. = inhibited; *M* = Mean, *SD* = standard deviation; G = Group; T = Time; *d* = effect size; [a] $n = 43$; [b] $n_{MST\text{-}CAN} = 16$, $n_{CG} = 33$.
* = $p < .05$.
** = $p < .01$.
*** = $p < .001$.

### 3.5. Reduction of emotional and behavioral problems and attachment disorder symptoms - MST-CAN group vs. comparison group

Table 6 illustrates the major differences between the MST-CAN group and comparison group with respect to emotional and behavioral problems and attachment disorder symptoms at T1 and T2. There were significant effects with medium to high effect sizes between the groups on CBCL total score ($p = .011$, $d = 0.57$), CBCL externalizing problems ($p = .002$, $d = 0.69$), and the RPQ subscale of inhibited attachment behavior ($p = .008$, $d = 0.81$). Children in the comparison group showed higher scores in these three scales than children in MST-CAN at both assessment points (T1 and T2). In addition, there was a significant reduction with medium to high effect sizes in all three CBCL scales and RPQ scales between T1 and T2 (see Table 6). This indicated that emotional and behavioral total problems, internalizing problems, externalizing problems, attachment disorder symptoms (RPQ total), and disinhibited and inhibited attachment behavior improved significantly between T1 and T2 in both groups. The group × time interaction was only significant for CBCL externalizing problems ($p = .017$) with a medium effect size ($d = 0.53$). Thus, children in MST-CAN experience a more marked improvement of externalizing problems between T1 ($M = 61.77$, $SD = 10.42$) and T2 ($M = 55.65$, $SD = 10.10$) than the children in the comparison group (T1: $M = 66.33$, $SD = 12.02$; T2: $M = 64.49$, $SD = 9.86$).

## 4. Discussion

The aim of this study was to examine if MST-CAN is effective and successful in a German-speaking area. For this purpose, we investigated whether MST-CAN can help families stay together, if the severity of neglect is reduced, and whether the improvement in emotional and behavioral problems and attachment disorder symptoms experienced by children undergoing MST-CAN is comparable to that in a comparison group of children in residential care.

The ultimate outcomes showed that at the end of MST-CAN, most children in the MST-CAN group were still living at home or in a stable environment with a long-term custody plan and were still attending school or work. Moreover, no new charges against parent or CPS reports had occurred after the end of the program. The ultimate outcomes had remained stable for the 18 months of follow-ups. These favorable outcomes were thought to be related to the fact that MST-CAN addresses and reduces parental mental problems (Hefti et al., 2018; Swenson et al., 2010), which in turn reduces the risk of CPS re-reports according to Solomon, Asberg, Peer and Prince (2016). Our results are in line with those reported by Swenson and colleagues (2010). In their study, the frequency of out-of-home placements and changes in the child's placement was significantly lower than that in the comparison group.

In addition to the favorable ultimate outcomes, CPS referrers reported that the severity of neglect was significantly reduced with a large effect size after MST-CAN. Thus, a main goal of MST-CAN, i.e. to make the environment of the children safer in their origin family, was achieved in these two German-speaking MST-CAN teams. In the present study, we unfortunately did not examine if the improvement of severity of neglect continued until a later point in time. The question therefore remains whether the positive effect of reducing neglect remains stable beyond the end of treatment. It cannot be excluded that this positive effect is due to the intensive care of the families during MST-CAN. Nonetheless, Swenson and colleagues (2010) showed that MST-CAN was still effective in reducing neglect according to self-report by youths and parents reports 16 months after ending MST-CAN. In line with Mulder et al. (2018) who maintained that the strongest predictors of child neglect are found in parental characteristics, we hypothesize that improved parenting abilities and parental mental health (as our workgroup showed in the same sample of MST-CAN families; Hefti et al., 2018) reduces child neglect. Because neglect leads to severe negative long-term consequences for affected children (Mbagaya et al., 2013), improvement of neglect as a key outcome measure should be represented more dominantly in the choice of interventions. As Landers et al. (2018) stated in their study, most studies of interventions to improve child abuse and neglect do not investigate the recurrence of this behavior, although it is often cited as an important outcome. Therefore, it is very positive that we included the CNI in the present study and were able to demonstrate the reduction of the severity of neglect.

At the beginning of MST-CAN, 70 (53.0%) children showed emotional and behavioral problems above the clinical cutoff. Of these, 47.0% were above the clinical cut-off for internalizing symptoms and 49.2% for externalizing symptoms. These numbers are comparable to those reported in international studies (Éthier et al., 2004; Hunt et al., 2017) and underline the association between different forms of child maltreatment and increased emotional and behavioral problems. The decrease of emotional and behavioral total problems and internalizing problems at the end of MST-CAN and at the 6-month follow-up is congruent with the findings reported by Swenson et al. (2010). Effect sizes for these improvements were medium to large in both studies. In the randomized controlled trial (RCT) of Swenson et al. (2010),

emotional and behavioral total problems and internalizing problems remained on a lower level than at the beginning of MST-CAN for an even longer period than in the present study. Among others, we hypothesize that the improvement of emotional and behavioral total problems and internalizing problems results from more positive parenting strategies (Pinquart, 2017), higher levels of parental sensitivity (the ability to accurately perceive and interpret the child's signals and respond to those signals in an adequate and prompt way; Ainsworth, 1979), fewer parental mental health problems, and improved social support of these families (Hefti et al., 2018; Hefti et al., 2019; Swenson et al., 2010).

Berzenski et al. (2014) underlined the moderating effect of parental mental distress on the association of neglect and internalizing problems in children. These associations need to be investigated more closely in the future. Furthermore, the present study showed that the children in MST-CAN had less externalizing problems 6 months after the end of the program. A positive association between cumulative adverse childhood experiences or severity of neglect and externalizing behavior was found by Hunt et al. (2017) and McGuire et al. (2018). We assume that reducing the severity of neglect positively correlates with improvement of emotional and behavioral problems in general and externalizing problems in particular.

In the screening for attachment disorder symptoms, 18.9% of the children in MST-CAN were above the clinical cutoff. Our overall finding that attachment disorder symptoms did not decrease significantly over time may be due to the very small sample size ($n = 12$) for children in MST-CAN with attachment disorder symptoms above the cutoff. Despite the small sample size, post-hoc analyses revealed significant reductions in the attachment disorder symptoms total score (T1-T3) as well as disinhibited (T1-T3) and inhibited attachment behavior (T1-T2) with large effect sizes. Thus, MST-CAN may be helpful for children with attachment disorder symptoms, but this needs to be evaluated in a larger population and over an extended period of time to confirm that these positive indications remain stable over time. Cyr and Alink (2017) underlined the importance and benefit of interventions that focus on attachment in maltreating parents and their children. In MST-CAN, improving parent-child interaction, lowering parental mental distress, and heightening the parental sensitivity among maltreating parents are important goals (Hefti et al., 2018; Hefti et al., 2019; Swenson et al., 2010). These measures help children improve their attachment behavior symptoms as suggested by Egeland et al. (2000). Since evidence-based interventions in children with attachment disorders are still scarce, our results may be seen as a step in a positive direction for children experiencing abuse and neglect who show symptoms in this spectrum.

In this naturalistic comparison-group design, a significant difference was found between the MST-CAN group and the matched comparison group for the total score of children's emotional and behavioral problems and externalizing problems with medium effect sizes. Specially, the scores were significantly higher in the comparison group than the MST-CAN group. This finding contradicts the results reported by Lawrence et al. (2006) who indicated that children who had experienced maltreatment and were placed out of home did not show higher rates of emotional and behavioral problems than did children who experienced maltreatment but were not placed out of home. It remains unclear whether children in out-of-home placement have higher scores because they have experienced more abuse in their family of origin than the children in MST-CAN have, or if the out-of-home placement itself was a traumatic experience possibly leading to increased emotional and behavioral problems (Sethi et al., 2013). In our study, both groups showed a decrease in the scores for total problems, internalizing problems, and externalizing problems over time. Therefore, we conclude that MST-CAN is a real alternative to out-of-home placement of children with maltreatment experiences with regard to the improvement of emotional and behavioral problems. For externalizing problems, there was a significant interaction effect. The children in MST-CAN showed a stronger decrease in these problems over time than children in the comparison group did. As suggested also by McGuire et al. (2018), we assume an association between the reduction of maltreatment frequency and severity and the improvement of externalizing symptoms.

Children with attachment disorder symptoms above the cutoff in MST-CAN and the comparison group showed improvement of attachment disorder symptoms in the total score as well as disinhibited and inhibited attachment behavior over time with large effect sizes. This is a particularly relevant result as it indicates that in both groups, children may experience improvement of attachment disorder symptoms. The two groups differed only with respect to inhibited attachment behavior, i.e. children in the comparison group in residential care showed higher values in this subscale at both assessment points. Children in both groups showed a significant reduction in the symptoms of attachment disorder as both interventions provided corrective experiences in interactions, improving the structure of daily life, and providing a safer place after experiences of CANt. For Swiss residential care, high-quality care is corroborated, and positive impacts on child welfare are demonstrated (Schmid, Kölch, Fegert, Schmeck, & MAZ.–Team, 2013). If needed, the psychotherapeutic treatment of children in out-of-home placement is often an important and essential part of the care of these children. However, the assumption that children with AD show fewer attachment disorder symptoms after some time in out-of-home placement is not readily accepted according to current research (Bruce et al., 2019) and needs further investigation.

### 4.1. Study limitations

The main limitation of the present study was that an RCT design in either MST-CAN study location in Switzerland was not feasible for ethical reasons. In addition, randomization would only have been justified if the MST-CAN teams were operating at full capacity for a longer period of time. This would have prevented new families from entering the program. By using a naturalistic comparison-group design, we were able to compare children in MST-CAN with children in residential care.

A further limitation of the study was our assumption that the two groups stemmed from the same subpopulation. Although children from both groups had emotional and behavioral challenges, other factors not measured in this study may have differed in the two groups. These factors may include socioeconomic characteristics and type, and severity of maltreatment experienced by the children and youths (Berger, Bruch, Johnson, James, & Rubin, 2009). In addition, parental cooperation with authorities, parental stress, parenting skills, social support, substance abuse, domestic violence, and criminal justice involvement are factors that may affect the decision to place a child out of home. Regarding attachment, parents of children and youths remaining at home might be more motivated to create a stable relationship with their offspring, which might additionally have influenced the results. Additionally, beside the fact if the children in the comparison group did receive psychiatric or psychotherapeutic treatment at T1, our assessments of treatment did not allow any statements about theoretical background, quality, and frequency of outpatient treatment. In future research, it would be important to collect more detailed information about the psychiatric or psychotherapeutic treatment.

It should also be noted that in MST-CAN, the questionnaires on children's behavioral and attachment problems were completed by parents, and in the comparison group the same questionnaires were completed by socio-educational professionals. We assume that parents responded in a more socially desirable way, whereas social workers with a more professional point of view possibly reported more behavioral and attachment problems. Additionally, the time span between T1 and T2 differed between the MST-CAN group and comparison group. Thus, further research should use a more adequate comparison group, ideally receiving an intervention that is more similar to MST-CAN. In addition, larger sample sizes allowing analyzing more confounding variables would be advantageous. Further, the ultimate outcomes were collected through parental self-reports. It cannot be ruled out that the parents

responded in a socially desirable way.

As a further limitation of the study, the Rosenthal effect was considered for influencing the results (e.g. Rosenthal & Rubin, 1982). Data were taken from two different studies with different backgrounds. MST-CAN was implemented as an intervention study, whereas data for the comparison group derived from a study with the purpose of quality assurance. Effect sizes in the intervention group might be larger due to the expectancy of taking part in an effective intervention study brought forth by involved professionals and conveyed to the participants as described by Rosenthal.

### 4.2. Conclusion, clinical implication, and direction for future research

Since families affected by CAN can have a large variety of burden and risk factors and the family's cumulative number of risks for child maltreatment may encourage recurrence and further CPS re-reports (Solomon et al., 2016), multimodal systemic interventions with the entire family may be necessary to effectively and sustainably reduce the risk of child maltreatment (Mulder et al., 2018). Although a number of evidence-based interventions for maltreated children (and their families) already exist, implementation of such programs or treatments are often difficult due to system-level barriers (Ganser et al., 2017).

It is important to point out that the association between CAN and risk factors and outcomes is highly complex, and further investigation is needed. In future research, the relationship between the reduction of all forms of abuse and in particular neglect and the improvement of emotional and behavioral problems and attachment disorder symptoms in children needs to be examined more closely. Nonetheless, we conclude that in families where children experience maltreatment, appropriate support and effective, evidence-based treatment is of substantial importance to improve the children's emotional and behavioral problems and attachment disorder symptoms and increase their chances of healthy development into adulthood.

MST-CAN is one of the few interventions for child maltreatment that is family-centered, includes parent-training, and treats the children within their families. Additionally, MST-CAN is effective because it addresses the multi-determined characteristics of child abuse and neglect. Based on the present and prior evaluations (Hefti et al., 2018; Hefti et al., 2019), we summarize that MST-CAN works well in a German-speaking area and shows good improvements in these families. Our results of alleviated severity of neglect and improved children's emotional and behavioral problems and attachment disorder symptoms suggest MST-CAN to be effective in Switzerland in helping families to stay together and to make the environment of the children safer in their origin family. Therefore, we conclude that MST-CAN constitutes a real alternative to out-of-home placement of children with maltreatment experience.

## Author Agreement

All authors have approved the final version.

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## Declaration of Competing Interest

Dr. Cynthia Cupit Swenson is a consultant in the development of MST-CAN programs through MST Services, LLC, which has the exclusive licensing agreement through Medical University of South Carolina for the dissemination of MST technology. The Psychiatric University Clinics Basel implemented two MST teams in Basel-Stadt, Switzerland in 2014.

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## Anhang B: Studie II

**Buderer, C.**, Kirsch, T., Pérez, T., Swenson, C. C., Fürstenau, U., Rhiner, B., & Schmid, M. (2024). Child and family characteristics in multisystemic therapy for child abuse and neglect (MST-CAN): Are there associations with treatment outcome? *Journal of Marital and Family Therapy, 50*, 453–476. https://doi.org/10.1111/jmft.12695

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ORIGINAL ARTICLE

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# Child and family characteristics in multisystemic therapy for child abuse and neglect (MST-CAN): Are there associations with treatment outcome?

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**Abstract**

Evidence-based indication for targeted interventions is a central approach in the field of child welfare and psychotherapy. This study explored the characteristics of children and families referred to Multisystemic Therapy for Child Abuse and Neglect (MST-CAN) in Switzerland and their associations with treatment outcomes. We sought to identify subgroups of children and families referred to MST-CAN and understand their specific needs and alignment with the program. We identified five distinct subgroups of children: (a) those characterized by clinically significant "social withdrawal" and "anxiety/depression," (b) with multiple clinically significant emotional and behavioral problems, (c) with predominantly externalizing problems, (d) with no pathological findings at all, with

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parents who were less stressed and had fewer mental health problems, and (e) with mainly internalizing problems and parents whose mental health problems deteriorated during treatment. Investigating the fit of children and families referred to treatment programs can enhance the understanding of their healthcare needs and enable more individualized interventions.

**KEYWORDS**
child behavior checklist, child neglect and maltreatment, evidence-based indications, multisystemic therapy for child abuse and neglect, profile types, treatment outcome

## INTRODUCTION

Every case of parental neglect and maltreatment is unique and often the result of a complex mixture of multiple risk factors and child characteristics (Mulder et al., 2018; Ogle et al., 2022; Sidebotham et al., 2006; Stith et al., 2009). The best fit of client and family characteristics to treatment is a relevant factor that significantly contributes to the success of psychotherapy (Brakemeier & Herpertz, 2019; Fonagy et al., 2002; Norcross & Wampold, 2011, 2018), especially in child and youth welfare (Chambers & Potter, 2009; Chng et al., 2018; Holmes & McDermid, 2012; Lorenz et al., 2020). In other words, it is important to ensure that the best-fitting therapy is delivered to a particular child, adolescent, or family. The vision of applying evidence-based indications of the need for different treatments and youth welfare measures, which means in essence to ground the decision for a specific treatment in empirical evidence, is not new (Chambers & Potter, 2009; Lorenz et al., 2020; Rijbroek et al., 2019). With faster digital assessments and algorithms, it has become more and more realistic.

In child welfare, it is common to collect substantial data on families and their children to find and allocate suitable interventions and services for them. Holmes and McDermid (2012) stated that based on finite resources, financial and otherwise, it is essential to ensure that well-suited services are provided at the right time to the families and children who need them most. Offering individuals and families a well-suitable program, effectively matching treatment components to different subgroups, is an important factor in maximizing treatment outcome (Lanza & Rhoades, 2013). In psychotherapy, the question of "What works for whom?" was raised as early as two decades ago by Fonagy et al. (2002) in their significant review of treatments for children and adolescents. The authors identified the failure of matching treatments to cases as one of the problems of evidence in child mental health outcome research (Fonagy et al., 2002). The basis for this type of study is a proper description of the characteristics of the referred clients and families (Brakemeier & Herpertz, 2019; Lanza & Rhoades, 2013) to examine what best works for whom.

Multisystemic Therapy for Child Abuse and Neglect (MST-CAN) (Swenson et al., 2010) is an evidence-based model that includes multiple research-backed treatments to meet specific needs for various issues and for all family members. So far, studies have focused on examining the overall effectiveness of the model (Buderer et al., 2020; Hefti et al., 2020; Swenson

et al., 2010). The possibility of adapting the MST-CAN program to the specific needs of families has been addressed by its developers (Swenson et al., 2010). A special adaptation of MST-CAN, the MST-Building Stronger Families, has been specifically tailored for families dealing with substance misuse (Schaeffer et al., 2021). A second special adaptation of MST-CAN, the MST for Intimate Partner Violence (MST-IPV; Swenson & Schaeffer, 2016), has been developed for families experiencing severe IPV and maltreatment. However, what works best for whom has not been examined yet in the MST-CAN context. To our knowledge, two studies have explored typologies in the context of multisystemic therapy (MST) (Henggeler et al., 2009) for serious behavior problems among adolescents (Keles et al., 2021; Mertens et al., 2017). This study is the first to undertake this goal for MST-CAN by analyzing different profiles of families and children referred to and treated with MST-CAN in Switzerland and to investigate whether some profiles are associated with better or poorer outcomes.

## The characteristics of high-risk families

Families at risk of child maltreatment can be described in different ways, but little is known about the distribution and proportion of risk factors and specific characteristics of individual families. A central aspect defining high-risk families is child maltreatment, which is associated with a considerable number of risk factors (Freisthler et al., 2006; Sidebotham et al., 2006; Stith et al., 2009). Multiple risk factors are often conceptualized based on Bronfenbrenner's social-ecological model (1979) as multidetermined by individual, familial, and community factors that have nested relationships (Belsky, 1993; Euser et al., 2015; Swenson et al., 2011; Turner et al., 2019). Besides a few risk factors at the child (e.g., externalizing behaviors) and environmental (e.g., areas with poverty, housing stress, social isolation, drug, and alcohol availability) levels, it is mainly risk factors relating to parents (e.g., mental health, substance misuse, single parenthood, unemployment, young age, and low educational achievement), parent–child interaction (e.g., parents' perception of the child, and parental stress), and the family (e.g., family conflicts, low social support, socioeconomic status, and domestic violence) that are associated with child maltreatment (Rijbroek et al., 2019; Stith et al., 2009; Zhang et al., 2022). Most studies have used a variable-centered approach, describing associations. Only a few have used a person-centered approach to depict profiles of high-risk families and their needs, although this approach is especially suggested in family psychology research to describe typologies of families (Henry et al., 2005).

In the context of high-risk families, Chambers and Potter (2009) identified three distinct subgroups of families through a cluster analysis in a sample of 160 substantiated child neglect cases. The first subgroup was characterized by low needs in most of the investigated areas like income, domestic violence, substance abuse, housing and transportation, previous out-of-home placement of a child, physical child functioning, and mental health problems of caregivers and children. In the second subgroup, substance abuse was predominant, alongside income, transportation, and housing problems, and domestic violence. In the third subgroup, needs in all clinical areas, caregiver and child mental and physical health issues, and domestic violence were salient, with high needs in all economic areas.

In another study by Rijbroek et al. (2019), the characteristics of 250 families from a Child Protection Service population in the Netherlands were investigated based on risk and protective factors on child, parental, and environmental levels. Five distinct subgroups were found by calculating a cluster analysis with parental risk factors as a discriminating aspect. The first subgroup was characterized by "multiparental problems," and the second group was

characterized by major life events. In the third subgroup, socioeconomic, housing, and financial issues, unemployment, and social isolation were dominant. Finally, the fourth and fifth groups were characterized by poor parenting skills and child risk factors.

A representative study with children aged 0–3 years from a sample of 7549 families randomly chosen from pediatric practices, investigating the distribution of risk factors, revealed four distinct groups of families (Lorenz et al., 2020). In the latent class analysis, unburdened families comprised 59% of the total number while multiple-burdened families comprised 5%. Moreover, 46% of the families showed an intermediate risk level, with 19% of them experiencing mainly socioeconomic burden and 17% facing high parenting stress and family conflicts. These studies illustrate how person-centered studies can describe families in different ways and that heterogeneity exists within high-risk families. The results also indicate that different profiles can be found among the families referred and treated with the MST-CAN.

## Children's emotional and behavioral problems in high-risk families

The consequences of child maltreatment and risk factors for developing mental health problems are well-documented. Less is known about the profile of children's mental health in high-risk families. Studies have found associations between child maltreatment and increased emotional and behavioral problems (Ethier et al., 2004; Hunt et al., 2017; Jaffee, 2017; Metha et al., 2021), and a range of mental health disorders such as depressive and anxiety disorders, drug use, and suicide attempts (Jaffee, 2017; Mehta et al., 2021; Norman et al., 2012), and somatic health outcomes in adulthood (Clemens et al., 2018; Felitti et al., 2019). As for risk factors for child maltreatment at the children's level, social competence, and internalizing and externalizing behavior of the child are considered evident, but the direction of causality is not clear (Stith et al., 2009). The results stem from studies with variable-oriented methods and do not offer information on the distribution of factors in specific types of families. Studies investigating subgroups of children with similar patterns of mental health symptoms have mainly focused on the general population and not on families with risk factors present. Petersen et al. (2019) reviewed the results of 23 studies using latent class analysis to identify subgroups of children with distinct patterns of mental health in the general population. In most of the studies they reviewed, the low- or no-symptom class constituted the majority (17%–91% of the sample). Studies that used internalizing and externalizing problems as indicators found an additional small class with multiple problems and some qualitatively different symptom classes, such as internalizing only, externalizing only, or a specific disorder (Petersen et al., 2019).

Dölitzsch et al. (2016) investigated the Child Behavior Checklist (CBCL) and YSR dysregulation profile in a high-risk population of children and adolescents aged 10–18 years living in residential care in Switzerland. The dysregulation profile is defined with *T*-scores above 67 for the subscales "anxious/depressed," "attention problems," and "aggressive behavior" and is considered associated with severe psychopathology (Dölitzsch et al., 2016). In this sample, 74% of the participants had at least one psychiatric disorder. For the dysregulation profile of the CBCL, 11.8% and for the YSR, 6.7% met the criteria for clinical levels of dysregulation.

## The fit of children and family's needs to targeted interventions

Researchers examining individualized psychotherapy have gone beyond disorders and have emphasized the need for adapting evidence-based therapy to the patients' disorders and

characteristics to generate the best treatment outcome (Brakemeier & Herpertz, 2019; Norcross & Wampold, 2011, 2018). As a basis for this, it is necessary to consider as many biopsychosocial characteristics (e.g., information processing, temperament, coping strategies, cultural aspects, interpersonal aspects, such as family and peers, socioeconomical status, and environmental factors) as possible (Brakemeier & Herpertz, 2019). While describing high-risk families and children, information can be derived from both the description of different types of child maltreatment and neglect (Ogle et al., 2022) and proven risk factors (Liel et al., 2020; Rijbroek et al., 2019). Understanding the match of families' needs to an appropriate service is a critical research area that has received little attention so far (Chambers & Potter, 2009; Rijbroek et al., 2019). In the context of MST (Henggeler et al., 2009), few studies have investigated subgroups of adolescents with serious behavior problems and their variation in treatment responses. The results revealed heterogeneity in treatment responses and underscored the need for tailoring MST to the different needs of adolescents (Keles et al., 2021; Mertens et al., 2017). Very few studies have examined interventions targeting child maltreatment (Euser et al., 2015; Fonagy et al., 2014; Levey et al., 2017), and there is almost no evidence available on the appropriate fit between family and children's profiles and the psychosocial treatments they receive.

## MST-CAN

MST-CAN is an evidence-based intervention program for families with children aged 6–17 years who have been exposed to physical abuse and/or neglect (Bauch et al., 2022; Buderer et al., 2020; Hefti et al., 2020; Swenson et al., 2010). Swenson et al. (2010) could show the superiority of MST-CAN compared with an enhanced outpatient treatment in their randomized controlled trial. MST-CAN was more effective in reducing internalizing (posttraumatic stress disorder, dissociation) and behavioral and emotional problems, out-of-home placements, and number of placement changes for youths who had to be placed owing to safety issues (Buderer et al., 2020). The program is based on Bronfenbrenner's (1979) social-ecological model and considers that effective interventions for the prevention and reduction of child maltreatment must address risk factors (Euser et al., 2015; Mulder et al., 2018; Swenson et al., 2011). On the basis of this, risk factors in families are identified and addressed with appropriate therapeutic methods (e.g., cognitive behavioral, behavioral family, and trauma therapy) for the child, parents, and siblings, following nine principles. MST-CAN is effective in reducing child neglect and children's emotional and behavioral problems (Buderer et al., 2020; Swenson et al., 2010). At a parental level, MST-CAN was effective in improving mental health and social support (Hefti et al., 2020; Swenson et al., 2010) and decreasing psychological distress (Hefti et al., 2020).

## Purpose of this study

The description of high-risk families and a comprehensive understanding of the population referred to interventions and services is central in child welfare and psychotherapy and enables the derivation of guidelines for action. The fit between clients and families and the psychosocial treatments to which they are referred is essential for the effective planning and distribution of services and can improve the effectiveness of interventions.

Families referred to MST-CAN are considered high risk and represent a heterogeneous population. Children with a broad range of mental health disorders are included in the program. Although MST-CAN is effective in reducing child maltreatment and improving children's and parents' mental health, we do not know if there is a subgroup of children and families for whom it works better or worse. Therefore, we investigated the characteristics of children and families and their fit for MST-CAN. With MST-CAN as a therapeutic program, our focus lies in the investigation of the children's and families' mental health needs. The following research questions are addressed in this study:

1. Can we identify clusters of MST-CAN families with specific characteristics?
   a. If so, how many clusters can be identified?
   b. Do the identified clusters differ in terms of specific characteristics?
2. Are these clusters associated with treatment outcomes?
   a. Are there associations of clusters with the ultimate outcomes of MST-CAN? (i.e., After the treatment with MST-CAN, is the child still living at home and going to school, are there any new charges against the parents, and are there any new CPS reports?)
   b. Are treatment outcomes regarding child neglect, parental mental health and stress, and children's emotional and behavioral problems associated with specific characteristics of the subgroups?

# METHODS

## Participants

Participants were 194 parent–child dyads from families that were referred to MST-CAN in Switzerland between 2011 and 2022 by child welfare agencies and protection services (CPS). Families were referred based on a report of physical abuse and/or neglect in the preceding 180 days documented by a social worker. The cases were screened a priori by the social worker of the referring child welfare agency or CPS and the MST-CAN team leader to see (a) if a multisystemic approach is necessary and makes sense, (b) if there is an indication for an intensive outpatient child protection intervention or out-of-home placement, (c) if an out-of-home placement can be avoided with a safety plan for the family and a 24/7 on-call service, (d) if there is parental mental health burden and/or substance misuse, and (e) if at least one parent can be motivated to participate in the treatment program.

The focal child and parent were invited to participate in the study. A total of 285 families were approached, with 200 parents providing informed consent to participate. Owing to intervention dropouts, we excluded 29 parent–child dyads (14.5%). They dropped out because of the lack of engagement ($n = 15$, 7.5%), out-of-home placements ($n = 5$, 2.5%), administrative withdrawals ($n = 4$, 2%), lack of funding ($n = 3$, 1.5%), and family relocation ($n = 2$, 1%) (Supporting Information Appendix A). We excluded six parent–child dyads owing to missing values. The final sample consisted of 194 parent–child dyads. The 194 families were treated by a total of 22 therapists. The number of treated families per therapist varied from 1 family (0.5%) to 32 families (16.5%). Participants of families who dropped out of the intervention program did not differ significantly from those whose families completed the intervention program in terms of demographic measures (i.e., age, sex, and migration background), severity of initial child neglect, levels of parental mental health, children's emotional and behavioral problems, and parental stress.

The children's mean age was 10.14 years (SD = 3.5). Of the total, 43.3% were girls, 98.5% were White Caucasian, and 1.5% were Asian. For 36.1% and 36.6% of the children, the reasons for referral were a confirmed or suspected case of parental neglect and abuse (physically, emotionally, or sexually), respectively. For 27.3% of the children, the referral was made because the parents were noticeably overwhelmed, with the specific form of maltreatment only being determined during treatment. Over half the children (57.7%) showed a clinical range of emotional and behavioral problems.

## Inclusion and exclusion criteria

In addition to the a priori screening described above, the following inclusion criteria for the intervention program were applied based on a clinical assessment by the MST-CAN team leader: focal child aged between 6 and 17 years; not acutely suicidal, homicidal, psychotic, or diagnosed with autism spectrum disorder level 2 or 3 (*DSM*; American Psychiatric Association & American Psychiatric Association, 2013); and living either with their families or in foster care with the prospect of being reunited with them soon. The following exclusion criteria were applied: active sexual abuse, severe domestic violence, and parental psychosis.

## Intervention

Participating families received two to three MST-CAN treatment sessions per week at the families' homes over a period of 6–9 months, delivered by one therapist. In an initial diagnostic assessment phase of several weeks, risk factors for CAN were identified and evidence-based intervention methods were applied accordingly to address and reduce specific risk factors. If indicated, a child and adolescent psychiatrist provided pharmacotherapy for the children. An on-call service (24 × 7) was available for all families to manage any crises that developed outside working hours. The MST-CAN model combines evidence-based systemic and cognitive behavioral interventions with a tailored fit case management in the living environment of the families. A more detailed description of the intervention program and its nine core treatment principles can be found in Swenson et al. (2010), Swenson and Schaeffer (2018), and the MST-CAN manual (Swenson et al., 2011).

*Clinical team*: The therapists worked in teams of 3–4 with a caseload of 3–4 families per therapist. The team was supported by a family resource specialist and supervised by a team supervisor, with individual and group supervision sessions taking place on a weekly basis. Furthermore, the team had weekly consultations with an MST-CAN expert to support adherence to the model.

*Therapist training*: All therapists underwent a 5-day training in MST (Henggeler et al., 2009), a 4-day training in MST-CAN, and a 4-day training in trauma therapy for adults and children. Booster training took place every 3 months for all therapists carried out by the MST-CAN expert to ensure the ongoing quality of the intervention program.

*Treatment fidelity*: Treatment fidelity was ensured using the Multisystemic Therapy Adherence Scale–Revised for Child Abuse and Neglect (TAM-CAN-R; Swenson, 2010), which is a revised version of the Therapist Adherence Measure–Revised (TAM-R; Henggeler et al., 2009). It is a reliable and valid measure of therapists' adherence to the nine core MST treatment principles (Schoenwald et al., 2008, 2009). An independent interviewer conducted the TAM-

CAN-R with the parent or caregiver on a monthly basis. The target requirement for the TAM-CAN-R is a value of 0.61, which was achieved by the MST-CAN team in Thurgau with $M = 0.70$ and almost achieved by the MST-CAN team in Basel with $M = 0.60$.

## Data collection

Ethics approval for this study was obtained from the local ethics committees (Ethikkommission Ostschweiz, Ethikkommission Nordwest- und Zentralschweiz). The data were collected between July 2011 and December 2018 in Thurgau and between November 2014 and October 2022 in Basel. Part of the recruitment of study participants took place during the COVID-19 pandemic. Although data collection remained possible and the majority of the data were collected before and after the COVID-19 pandemic, we must assume that the study was affected by the pandemic. Therapy could be conducted in participants' homes despite COVID-19 measures, but in larger families and constricted living conditions, video calls were used as an alternative to in-person treatment. Additionally, treatment requests increased during the pandemic because families were under greater stress.

Oral and written informed assent from underaged participants and legal guardians, respectively, were obtained before data were collected. With the help of a research assistant, participating parents and children completed a set of questionnaires at the beginning of the treatment and at the end of the intervention. The ultimate outcomes ([a] child is living at home, [b] child is attending school, [c] no new charges against the parent, and [d] no new report to CPS) were assessed and recorded by the team leader upon the completion of MST-CAN, which is part of the standardized mandatory quality assessment requested by MST Services. The severity of child neglect was assessed externally by interviewing the caseworker of the referring child welfare agency or protection service at the beginning and at the end of MST-CAN. The caseworker reported case characteristics and type and severity of maltreatment experienced by the children.

## Measures

*Ultimate outcomes of MST-CAN*: There are four primary treatment outcomes that are considered the ultimate outcomes of MST-CAN: (a) the child is living at home or in a stable and safe environment, (b) the child is going to school, (c) there are no new charges against the parents, and (d) there is no new report to CPS. The outcomes were assessed by the MST-CAN team leader at the end of the treatment and were rated as 0 = No or 1 = Yes. The first outcome entails the child living at home or with extended family members or in a stable environment that best meets the needs of the child while providing a positive permanency plan. For the second outcome, attending school, being in a vocational training program, or having a paid job for at least 20 h a week are considered a positive outcome. For the third outcome, the parents had to confirm that there had been no new charges against them and that they had not been arrested during or after MST-CAN, and for the fourth outcome, that there had been no new CPS report of maltreatment during or after MST-CAN.

*Childhood emotional and behavioral problems*: To assess children's emotional and behavioral problems, we used the CBCL (Achenbach, 1991; CBCL/4-18; Workgroup German Version of the Child Behavior Checklist, 1998), which comprises 113 items, on which the parents are asked if they had observed a specific behavior in their child and they reported on a

three-point scale with "not true" (0), "somewhat true" (1), or "always or often true" (2). The items can be summarized into eight subscales (i.e., social withdrawal, somatic complaints, anxiety/depression, social, thought, and attention problems, and delinquent and aggressive behavior) and two broadband scales (internalizing and externalizing) and a total score. For clinical purposes, raw scores are converted into *T*-scores. For the three scales of internalizing, externalizing, and total problems, scores between 60 and 63 are considered a borderline clinical range, and above 63 is considered a clinical range. Walter and Remschmidt (1999) reported good psychometric characteristics with retest-reliability, internal consistency, and discriminative validity scores for internalizing, externalizing, and total problems above 0.70. In the present sample, the internal consistency for the total score was excellent, with Cronbach's $\alpha = 0.94$.

*Child neglect*: We used the Ontario Child Neglect Index (CNI; Trocmé, 1996) to measure the severity of neglect. The CNI comprises six items reflecting the different forms of neglect (i.e., supervision, nutrition, clothing and hygiene, and physical, mental health, and development/educational care). The six items are rated on a 4–5-level scale (i.e., "adequate," "inconsistent," "inadequate," and "seriously inadequate") by trained child welfare professionals. To calculate a total score, which reflects the severity of neglect, not only the score of the scales are added, but an age score ranging from 0 (13–16 years) to 20 (0–2 years) is added to the highest score among the six scales. This is because the underlying model assumes that the six neglect items represent different forms of neglect rather than different components that can be added together. The total score can range between 0 and 80, with higher scores indicating more severe levels of child neglect.

Trocmé (1996) reported a test–retest reliability of the scales (weighted kappa) varying from 0.83 to 0.91, an interrater reliability (Pearson's *r*) for the total score ranging from 0.88 to 0.91, and strong concurrent validity supported by high correlations between the CNI and other neglect scales. The current study used an unpublished German version of the CNI (Pérez et al., 2017), which was approved by Trocmé based on a back-translation into English.

*Parental mental health*: The Brief Symptom Inventory (BSI, Derogatis & Melisaratos, 1983; German version, Franke, 2000) was applied to measure parental mental health. This self-report questionnaire with 53 items is a short form of the Symptom Checklist 90 Revised (Derogatis, 1993) that measures self-reported psychological distress on nine subscales, namely, somatization, obsessive–compulsiveness, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism. Symptoms are rated based on a Likert scale ranging from 0 ("strongly disagree") to 4 ("strongly agree"). We used the Global Severity Index (GSI), which is the total score summed up for all items. Higher total scores indicate higher levels of mental health problems. For the German version of the scales, moderate to high internal consistency ranging from $\alpha = 0.82$ to 0.93 and high concurrent validity with other measures of specific mental health disorders was reported by Franke et al. (2017). In the present sample, the internal consistency for the GSI was excellent, with Cronbach's $\alpha = 0.95$.

*Parental stress*: We used the Parental Stress Scale (PSS, Berry & Jones, 1995; German version, Kölch & Schmid, 2008) to assess parental stress. This self-report questionnaire consists of 18 items measuring perceived parenting stress on a Likert scale ranging from 1 ("strongly disagree") to 5 ("strongly agree"). Items comprise statements on positive aspects (e.g., "I am happy in my role as a parent") and negative aspects of parenthood (e.g., "Having children leaves little time and flexibility in my life"). Eight items were inverted. All items are summed up to a total score, with higher scores indicating higher levels of parental stress. Berry and Jones (1995) reported a reliability of $\alpha = 0.83$ and a 6-week test–retest reliability of 0.81 and a

strong concurrent validity with other measures of parental stress. In the present sample, the internal consistency was good, with Cronbach's $\alpha = 0.86$.

## Data analysis

Data analysis was conducted using IBM SPSS 29. First, descriptive statistics and frequency distributions were calculated for the demographic sample characteristics. To answer the first research question, a hierarchical cluster analysis using Ward's (1963) method and squared Euclidean distances was conducted with the eight subscales of the CBCL, namely, social withdrawal, somatic complaints, anxiety/depression, social, thought, and attention problems, and delinquent and aggressive behavior, on the complete sample. Ward's method is a common agglomeration method that leads to plausible cluster solutions if the outliers are eliminated beforehand (Bacher et al., 2010; Wiedenbeck & Züll, 2010). We sought a cluster solution with 4–6 clusters to both keep them interpretable and avoid any methodological artifacts with simple extreme groups (cf. Schmid, 2006). We only analyzed full data sets. First, we analyzed the data for outliers. There were no outliers in the data as assessed by the Mahalanobis distance ($p > 0.001$). Second, hierarchical cluster analysis was conducted with 4–6 predefined clusters. Dendrograms and agglomeration schedules were reviewed and possible cluster solutions were examined numerically and graphically vis-à-vis group means, levels, and profiles to determine the final cluster solution.

We examined differences among the identified clusters on measures that were excluded in the hierarchical cluster analysis (e.g., age, parental mental health, and stress). For continuous variables (e.g., BSI, PSS, and CNI), we calculated one-way analysis of variance analyses (ANOVAs) with post hoc comparisons using Tukey's honest significant differences (HSDs). The partial eta-squared ($\eta_p^2$) is reported as the effect size, with effect sizes of 0.06, 0.06–0.14, and 0.14 considered small, medium, and large, respectively (Cohen, 2013). For nominal variables (e.g., gender, migration background, and single parenthood), chi-square scores were calculated.

To answer the second research question, we examined differences among the clusters on different outcome measures. For the MST-CAN ultimate outcomes (dichotomous variables) (a) the child is living at home or in a stable and safe environment, (b) the child is going to school, (c) there are no new charges against the parents, and (d) there is no new report to CPS, we first calculated frequencies. For between-group differences, we calculated chi-square scores. For the continuous variables CNI, CBCL, BSI, and PSS, we first subtracted the total scores at the end of the treatment from those at the beginning to assess changes. Higher scores demonstrate a greater reduction in neglect and parental stress and improvements in parental mental health and emotional and behavioral problems. We then calculated one-way ANOVAs with post hoc comparisons using Tukey's HSDs. The partial eta-squared ($\eta_p^2$) is reported as the effect size, as described above. The global $\alpha$ value was set as 0.05 for all calculations.

# RESULTS

This section first describes the results of the cluster analyses (first research question) and then the comparison of the identified subgroups on treatment outcomes (second research question). The descriptive characteristics of the sample are summarized in Table 1.

TABLE 1 Descriptive characteristics of the sample.

| Characteristics | *n* (%) | *M* (SD) |
|---|---|---|
| Child age | | 10.14 (3.5) |
| Female | 84 (43.3) | |
| Swiss | 123 (63.4) | |
| Northern, central, and southern Europe | 53 (27.3) | |
| Southeastern and eastern Europe | 12 (6.2) | |
| Other countries (America, Asia, and North Africa) | 6 (3.0) | |
| Single parenthood | 100 (51.5) | |
| Parent unemployed | 85 (43.8) | |
| Parent without graduation | 13 (6.7) | |
| Multiple children in the household | 90 (46.3) | |
| Child neglect as the reason for referral | 70 (36.1) | |
| Child abuse as the reason for referral | 71 (36.6) | |
| Prior CPS report | 33 (17) | |
| Prior removal of custody | 13 (6.7) | |
| Parental mental health is clinically significant | 52 (26.8) | |
| Child's emotional and behavioral problem are clinically significant | 112 (57.7) | |

Abbreviations: CPS, child protection service; *M*, mean; SD, standard deviation.

## Subgroups identified in cluster analysis and characteristics

*Identification of clusters*: To determine if there were meaningful underlying patterns in the data on the children's emotional and behavioral problems, a cluster analysis was conducted on the eight subscales of the CBCL (i.e., social withdrawal, somatic complaints, anxiety/depression, social, thought, and attention problems, and delinquent and aggressive behavior). Figure 1 presents the children's profiles with mean scores. For more details, see the table in Supporting Information Appendix B. Results from the cluster analysis showed that a five-cluster solution produced the most meaningful profiles for the data. Clustering solutions for 4–6 groups were inspected, and the five- and six-cluster solutions were found to be the most practical. The distinction between the groups was more meaningful in terms of clinical phenomenology in the five-cluster solution than in the six-cluster solution, which is why the former was selected. The five-cluster solution was stable when compared with the four- and six-cluster solutions.

*Group 1: Children with anxious-avoidant symptoms*: The first group ($n = 59$) scored in a clinical range on the scales "social withdrawal" and "anxiety/depression." For the subscales "somatic complaints," "social problems," "attention problems," and "aggressive behavior," the scores were in the borderline clinical range or slightly above, according to the parents' report. For the subscales "thought problems" and "delinquent behavior," the scores were in the normal range. The results indicate a clinical picture of the anxious or depressed child exhibiting avoidant behavior.

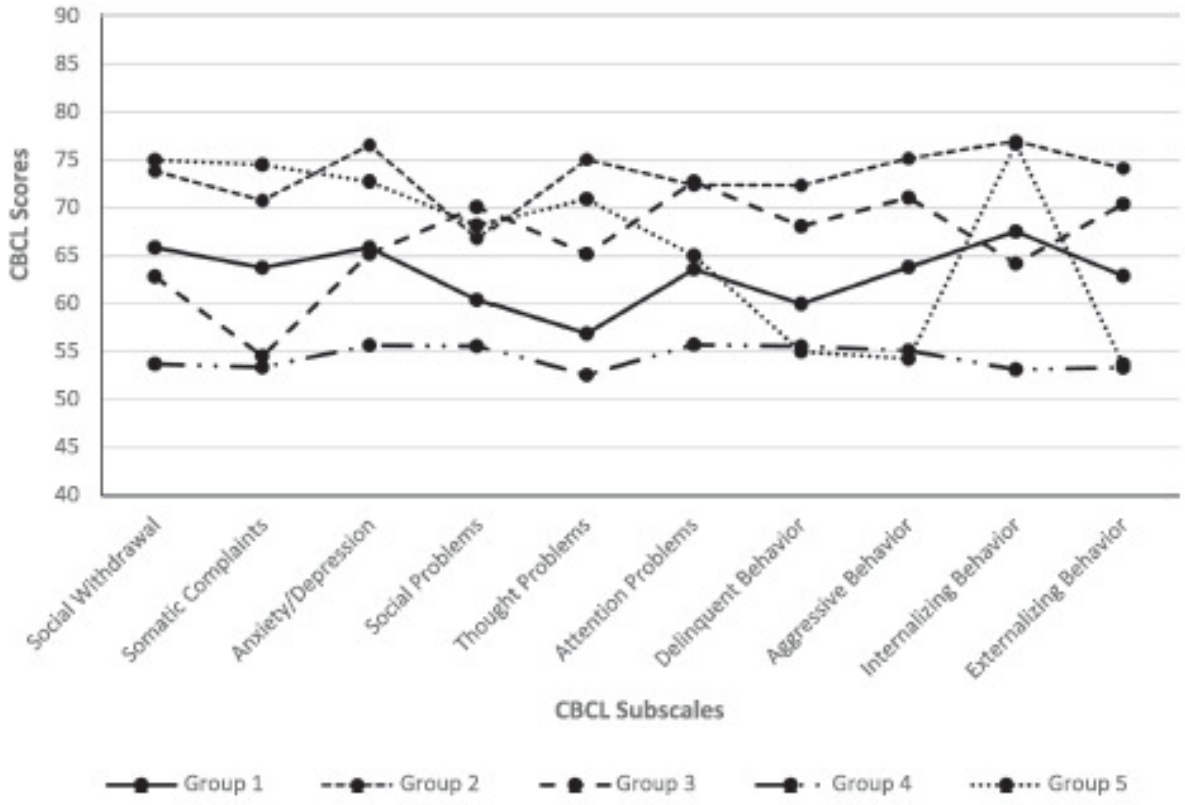


FIGURE 1 CBCL profiles of children during admission to MST-CAN. CAN, Child Abuse and Neglect; CBCL, Child Behavior Checklist; MST, Multisystemic Therapy.

*Group 2: Children with multiple symptoms*: The second group ($n = 25$) scored high in the clinical range on all subscales. This group met the criteria for the CBCL dysregulation profile, with *T*-Scores above 67 for the subscales "anxious/depressed," "attention problems," and "aggressive behavior," indicating severe psychopathology.

*Group 3: Children with externalizing symptoms*: The third group ($n = 30$) scored in a clinical range on all subscales except on the scales of "social withdrawal" and "somatic complaints," for which the scores were in the normal range. These results point to more externalizing problems within this group.

*Group 4: Children with normative emotions and behavior*: The fourth group ($n = 68$) was the largest. This group scored low in a normal range across all the subscales, indicating that the children in this group had no pathological findings. The results point to a normative group of children and adolescents who seemed less affected by child maltreatment experiences.

*Group 5: Children with internalizing symptoms*: The fifth group ($n = 12$) was the smallest. This group scored in a clinical range for all the subscales, except "delinquent behavior" and "aggressive behavior," for which the scores were in the normal range. This group had internalizing problems.

*Cluster characteristics*: Significant differences between the groups were found for parental mental health and stress. Parents in the fourth cluster "children with normative emotions and behavior" showed significantly lower scores on the parental health measure (BSI) than did those in the first "children with anxious-avoidant symptoms" and second groups "children with multiple symptoms." For the PSS, the parents in the fourth cluster "children with normative emotions and behavior"

showed significantly lower scores than did all the other groups. For all other characteristics, no significant differences between the groups were found (Tables 2 and 3).

## Between-group comparisons of treatment outcomes

The ultimate outcomes were reached overall in at least 90% of the cases or above, which is in line with the expected goal for MST-CAN of 90% fulfillment. Between-group comparisons did not reveal significant differences for the ultimate outcomes: The child is living at home ($X^2(4) = 1.48$, $p = 0.830$), the child is going to school ($X^2(4) = 3.43$, $p = 0.488$), no new charges against the parents ($X^2(4) = 5.74$, $p = 0.377$), and no new CPS report ($X^2(4) = 4.22$, $p = 0.219$) (see Table 4). In every group, the ultimate outcomes were reached in at least 80% of the cases.

One-way ANOVAs did not reveal significant differences between the groups for the outcome measures CNI, PSS, and CBCL. For the BSI ($F(4, 115) = 4.42$, $p = 0.002$), significant subgroup differences were found with a medium effect size ($\eta_p^2 = 0.133$). Tukey's post hoc analysis revealed a significant worsening in the fifth group "children with internalizing symptoms" compared with all other subgroups. Table 5 presents the results.

# DISCUSSION

This study examined the characteristics of the children and families referred to MST-CAN. We identified subgroups of children with specific profiles and investigated whether they differed from each other vis-à-vis specific characteristics. We chose the perspective of the child as the

TABLE 2 Chi-square tests on the pretreatment differences in characteristics across the five groups.

| Characteristics | Group 1: *n* (%) | Group 2: *n* (%) | Group 3: *n* (%) | Group 4: *n* (%) | Group 5: *n* (%) | $X^2$ |
|---|---|---|---|---|---|---|
| Female | 27 (45.8) | 12 (48.0) | 10 (33.3) | 28 (41.2) | 7 (58.3) | 2.81 |
| Migration background | 23 (39.0) | 6 (24.0) | 13 (43.3) | 26 (38.2) | 3 (25.0) | 3.22 |
| Single parenthood | 29 (49.2) | 13 (52.0) | 16 (53.3) | 32 (47.1) | 10 (83.3) | 5.14 |
| Parent unemployed | 22 (37.3) | 10 (40.0) | 16 (53.3) | 33 (48.5) | 4 (33.3) | 3.81 |
| Parent without graduation | 4 (6.78) | 3 (12.0) | 1 (3.33) | 5 (7.35) | 0 (0) | 0.58 |
| Multiple children in the household | 33 (54) | 8 (32.0) | 14 (46.6) | 28 (41.2) | 7 (58.3) | 6.46 |
| Referral because of child neglect | 19 (32.2) | 7 (28.0) | 16 (43.3) | 24 (35.3) | 4 (33.5) | 0.78 |
| Referral because of child abuse (physical, sexual, and emotional) | 20 (33.9) | 7 (28.0) | 13 (53.3) | 28 (41.2) | 3 (25.0) | 0.78 |
| CPS report before | 9 (15.3) | 7 (28.0) | 7 (23.3) | 9 (13.2) | 1 (8.3) | 8.64 |
| Removal of custody | 2 (2.4) | 3 (12.0) | 4 (13.3) | 4 (5.8) | 0 (0) | 4.11 |

Abbreviation: CPS, child protection service.

TABLE 3 One-way ANOVA with Tukey's HSD post hoc tests on the pretreatment differences in characteristics across the five groups.

| Measure | Group 1: *M* (SD) | Group 2: *M* (SD) | Group 3: *M* (SD) | Group 4: *M* (SD) | Group 5: *M* (SD) | *F* | *p* | Tukey's HSD homogenic subgroups |
|---|---|---|---|---|---|---|---|---|
| Age | 10.67 (3.89) | 10.96 (3.66) | 8.9 (3.00) | 9.62 (3.16) | 11.92 (2.75) | 2.91 | 0.023 | – |
| CNI | 44.18 (19.37) | 38.50 (15.82) | 42.41 (20.94) | 40.75 (20.46) | 30.00 (17.16) | 1.24 | 0.298 | – |
| BSI | 55.76 (14.41) | 58.29 (13.25) | 52.62 (14.44) | 45.27 (15.04) | 54.18 (17.03) | 5.61* | <0.001 | 1, 2 > 4 |
| PSS | 42.91 (10.38) | 47.08 (9.26) | 42.23 (9.50) | 34.20 (10.43) | 45.00 (14.54) | 9.84* | <0.001 | 1, 2, 3, 5 > 4 |

Abbreviations: ANOVA, analysis of variance analysis; BSI, Brief Symptom Inventory; CBCL, Child Behavior Checklist; CNI, Child Neglect Index; HSD, honest significant difference; *M*, mean; PSS, Parental Stress Scale; SD, standard deviation.

*$p < 0.001$.

TABLE 4 Chi-square tests on the MST-CAN ultimate outcomes across the five groups.

| MST-CAN Ultimate outcomes | Group 1 (%) | Group 2 (%) | Group 3 (%) | Group 4 (%) | Group 5 (%) | Total (%) | MST guidelines (%) | $X^2$ |
|---|---|---|---|---|---|---|---|---|
| Child is still living at home | 90.48 | 90.48 | 90 | 92.68 | 80 | 90.30 | 90 | 1.48 |
| Child is still going to school | 95.24 | 90.48 | 90 | 95.12 | 80 | 92.54 | 90 | 3.43 |
| No new charges against the parent | 88.10 | 100 | 95 | 95.12 | 80 | 92.54 | 90 | 5.74 |
| No new CPS report | 90.48 | 100 | 95 | 90.24 | 80 | 91.79 | 90 | 4.22 |

Abbreviations: CAN, Child Abuse and Neglect; CPS, child protection service MST, Multisystemic Therapy.

TABLE 5 One-way ANOVA on the pre–post-treatment differences between the groups.

| Measure | Group 1: *M* (SD) | Group 2: *M* (SD) | Group 3: *M* (SD) | Group 4: *M* (SD) | Group 5: *M* (SD) | Total: *M* (SD) | *F* | *p* | Effect size $\eta_p^2$ |
|---|---|---|---|---|---|---|---|---|---|
| CNI | 20.77 (20.06) | 6.47 (19.02) | 13.65 (17.81) | 13.85 (21.98) | 20.00 (18.97) | 15.45 (20.45) | 21.87 | 0.119 | 0.051 |
| BSI | 7.95 (14.65) | 5.79 (10.19) | 10.25 (16.71) | 6.78 (12.68) | −14.57 (16.15) | 6.37 (14.80) | 4.42* | 0.002 | 0.133 |
| PSS | 3.50 (9.96) | −1.23 (4.90) | 2.95 (6.51) | 2.83 (7.94) | 4.88 (9.98) | 2.76 (8.32) | 0.95 | 0.436 | 0.032 |
| CBCL | 6.59 (6.10) | 8.80 (12.31) | 6.80 (7.86) | 4.31 (7.32) | 1.38 (8.60) | 5.80 (7.99) | 1.71 | 0.153 | 0.055 |

Abbreviations: ANOVA, analysis of variance analysis; BSI, Brief Symptom Inventory; CBCL, Child Behavior Checklist; CNI, Child Neglect Index; PSS, Parental Stress Scale; *M*, mean; SD, standard deviation.

*$p < 0.05$.

primary focus of the MST-CAN treatment program to understand the clinical needs of the treated children better. The second goal was to investigate associations among the subgroups with treatment outcomes to check whether there were better or poorer outcomes for some groups.

## Identification of subgroups

We identified five distinct subgroups of children within the MST-CAN population at the time of admission based on the eight subscales of the CBCL. The first group of "children with anxious-avoidant symptoms" (30%) was characterized by clinically significant "social withdrawal" and "anxiety/depression" and subclinical scores on other subscales, which indicates a clinical picture of children or adolescents with anxious-avoidant behavior. This result aligns with the review of Petersen et al. (2019) on the investigation of subgroups of children with similar mental health patterns. The authors found that while internalizing and externalizing problems were used as indicators in the literature, a specific disorder was revealed in one of the groups. Thus, the studies included in the review mainly investigated children and adolescents from the general population.

The parents in this group scored significantly higher in mental health problems than did those in the fourth group. This aligns with Chambers and Potter (2009), in which high clinical needs for children were accompanied by high clinical needs for the caregiver. Besides higher scores in parental mental health, the parents in this group showed significantly higher scores in parental stress than did those in the fourth group. However, this difference was found for all other groups while drawing comparisons with the fourth group. This result contradicts those of Lorenz et al. (2020), who found only one group with parenting stress burdens in their sample from the general population. However, the two different results can be considered an indication that high-risk families are characteristically different from the families of the general population. As for all other assessed characteristics and measures, no additional group differences were found. This is surprising, as one can assume that higher mental health needs are accompanied by more risk or burdening factors. Chambers and Potter (2009) found high scores for child neglect and high economic needs in a similar group.

The second group of "children with multiple symptoms" (13%) presented multiple clinically significant emotional and behavioral problems, which is likely indicative of severe psychopathology of the children in this group (Deutz et al., 2020; Dölitzsch et al., 2016). Dölitzsch et al. (2016) found in their sample of high-risk children and adolescents that 11.8% met the criteria of the dysregulation profile. These criteria were met in this group but not in any of the others. While comparing the results of both studies, the number of children with a dysregulation profile seemed similar. The results of one group showing multiple mental health problems align with Petersen et al. (2019), who pointed to the multimorbid class. Much like the first group, parents in this group showed more mental health problems and higher parental stress scores than did parents in the fourth group. We could not find more distinct differences vis-à-vis the other measures and characteristics, which contradicts other studies.

The third group "children with externalizing symptoms" (15%) was characterized by predominantly externalizing problems. This result aligns with the pattern of classes found in Petersen et al. (2019). We found heightened parental stress scores in this group, too, when compared with the fourth group. The relationship between children's externalizing behavior and parental stress is well known in the literature (Morgan et al., 2005). Children's

externalizing problems are often related to parental mental health problems (Everett et al., 2021), for which we could not find indicators in this group. Externalizing problems for the children in this group did not accompany specific group characteristics.

In the fourth and largest group of "children with normative emotions and behavior" (35%), low scores in a normal range pointed to no pathological findings at all. Parents were significantly less stressed than those in the other groups, which seems conclusive as they may be less burdened owing to the higher functioning levels of their children. Children and adolescents in this group seemed less affected by child maltreatment experiences. This may be because some children experience the negative effect of maltreatment later in life (Fonagy et al., 2014) and may be more resilient. The results may be biased in a socially desirable manner. Much like the no-symptom results in this group, Petersen et al. (2019) found a large no-symptom group of children and adolescents in their review. Lorenz et al. (2020) found that one out of four groups of families in their study did not display burdening factors. Thus, the comparison of the general population with a high-risk sample is limited.

In the fifth group of "children with internalizing symptoms" (6%), children were characterized by mainly internalizing problems. As in all the other groups, this group fit into the pattern of identified groups reported in Petersen et al. (2019). The parents of these children showed heightened parental stress scores when compared with the fourth group. Aside from parental stress, the relationship between parental mental health problems and children's internalizing problems is documented in the literature (Bayer et al., 2006). Much like our findings for the third group, we did not find a relationship between children and parents' mental health. There were no other specific group characteristics.

## Associations with treatment outcomes

The secondary goal was to compare the subgroups on the treatment outcomes to verify whether MST-CAN works better or worse for some of the referred families. The ultimate outcomes of MST-CAN were as follows: the child is living at home, the child is going to school, no new charges against the parents, and no new CPS report. No group differences were found in the ultimate outcomes. The results point to an equal benefit for all subgroups of families. MST-CAN seemed equally beneficial for all groups when it came to the reduction of child neglect and parental stress and the improvement of child emotional and behavioral problems. We see this as indicative of the precise description of the MST-CAN referrals through the inclusion and exclusion criteria. We found that allocation pathways are well established and that MST-CAN is suitable for a large number of different families.

As seen in the extant research (Bauch et al., 2022; Buderer et al., 2020; Hefti et al., 2020), this study suggests improvements in parental mental health and stress as a benefit of MST-CAN. Nevertheless, we identified one group, namely, the fifth group of children, as showing mainly internalizing symptoms, for which parental mental health deteriorated during the treatment. There is an association between parental mental health and child psychopathology (Bayer et al., 2006; Stadelmann et al., 2010). However, we could not find supportive evidence in the literature that interventions had a negative effect on parental mental health problems. Everett et al. (2021) reported the positive effects of psychotherapeutic interventions on parental and child psychopathology and pointed to the need for more research to better understand the transactional influences. There is a lack of treatment studies focusing on parents with mental health problems and their children with internalizing symptoms (Everett et al., 2021). From our

clinical perspective, this deterioration may be the result of parents' increased understanding of their own mental health problems and a higher self-awareness through therapy. However, it remains unclear whether this phenomenon can be ascribed to this group.

## Limitations

We assume the generalizability of the data to other Western countries, although Switzerland may show some legal specificities. However, generalizability may be limited to racial and ethnic groups other than White Caucasians. Furthermore, we must assume that there is a constraint of variance that limits the generalizability of the results and did not allow us to find group differences. Two selections of the referred families were made during the referral process, first by the case worker of the referring child welfare agency and second by the MST-CAN team leaders, who do a precise job of checking the inclusion and exclusion criteria of the families. However, no standardized measures were used for the assessment of inclusion and exclusion criteria, which may have led to slight variations in the assessment of referrals. More studies are needed to explore whether the clusters identified in this study can be identified in other intervention programs for child maltreatment and neglect and thereby provide more evidence for the generalizability of the results.

It represents a strength of the study that child neglect and the existence and typology of child maltreatment were assessed from an external, professional perspective by caseworkers who were familiar with the families. However, children's emotional and behavioral problems, parental mental health, and stress were measured with questionnaires using parents' reports. In the context of child protection as a socially sensitive area (Van de Mortel, 2008), we assume that parents may want to present themselves in good light, although they appear, from our clinical perspective, far more mentally burdened and stressed in their parenting (Hefti et al., 2020). The literature shows that parents who report their children's psychopathology can be biased by their own psychopathology and stress (De Los Reyes & Kazdin, 2005). Some differences may become evident with child self-reports. To reduce biases in the data, future research should consider using a multimethod assessment, including observational methods and clinical interviews.

To give a more complete picture of the children, it would have been helpful to include their diagnoses in the analysis, but owing to time constraints, it was not possible to carry out standardized diagnostic interviews with all the children and parents. With MST-CAN as an intervention program, the priority was not assessing a substantial number of risk factors but factors relevant to evaluating the effectiveness of the program. In our cluster approach, we chose the children's psychopathology as a clustering criterion. However, it is possible that there are other criteria that could have led to different clusters.

Since the study was partially conducted during the COVID pandemic, we must assume that the study results were influenced in various ways. The different session modalities, in-person sessions versus telemental health sessions, may have produced different treatment effects. Furthermore, the higher burden and stress levels of families during the pandemic could also have had an impact on treatment outcomes.

Another aspect that needs to be considered in evaluating the treatment effects is the different values of the two MST-CAN teams in treatment fidelity. The fidelity score of one team just remained below the threshold. Additionally, individual therapist efficacy may have played a role, which we did not account for in this study.

With cluster analysis as an exploratory method to find underlying patterns in data, our focus on the calculation was on finding plausible clusters. For this intention and small sample sizes, the Ward method is the only suitable option (Bacher et al., 2010). Although we could find a cluster solution that fulfills the criteria of validity, the method brings forth limitations. A particular limitation is the false-positive identification of a cluster, where we have to assume the absence of a cluster structure in the data and the tendency to yield two clusters in the unimodal data (Tokuda et al., 2022). Therefore, the five-cluster solution must be interpreted with care and must be validated and replicated further in data sets from other studies. The detected five-cluster solution may display a preliminary template for future studies.

## Implications

This study suggests that in the context of MST-CAN, the mental health needs of children and families are different, whereas the common factor for referral is the experience of physical abuse and/or neglect. By identifying typologies of mental health needs among the families, this study underscores the need to conduct person-oriented studies. This could complement research on the general effectiveness of intervention programs with variable-centered studies to better understand families' individual needs. Furthermore, this study sought to answer the question of "what works for whom" in the context of MST-CAN. We demonstrated that MST-CAN works well for a heterogeneous range of families. This success can be attributed to the well-described referrals to the program, guided by the MST-CAN goals and guidelines (requirements for implementation to support model fidelity). However, the psychological needs of children are only one aspect of describing families and provide indications that systemic risk and protective factors are equally important in therapy planning. Individual differences in treatment outcomes can indeed exist but may not be reflected owing to methodological artifacts that erase symptoms (e.g., compulsive symptoms, sleep problems, and bedwetting).

For families in which parental mental health is suspected to be deteriorating, it may be helpful for clinical work to identify them as soon as possible in the treatment process to address their needs with targeted interventions or additional services. It can be helpful for these families to primarily focus on identifying and strengthening their resources at the beginning of the treatment. For some families, termination and transition to another treatment may be more beneficial. Not only does this contribute to a more individualized treatment approach, but it also helps allocate limited resources where they are needed most.

It would be helpful for other intervention programs in the field of child and youth welfare and psychotherapy to examine and describe their referrals by applying person-oriented approaches to gain more information in this area. Further studies with larger sample sizes and referrals in different child protection interventions are necessary to support the existence of and compare clusters.

Our study results reaffirm to continue with the effort that MST-Services already invest in quality assurance and ensure that goals and guidelines are consistent with the demand specifications in the MST-CAN organizational manual (Swenson et al., 2011). The results suggest that providing training, especially for MST-CAN team leaders responsible for screening the referrals, confirming indications with each family and the assigning social workers, is worthwhile. Consequently, it becomes an important quality standard and a factor contributing to effective treatment outcomes. In general, when it comes to the description of referrals, more research quality assurance is necessary to pave the way for more evidence-based indications.

## Conclusion

In sum, our study provides the first evidence that there are typologies of mental health needs among families referred to and treated with MST-CAN. Furthermore, the results suggest that a heterogeneous span of families benefit from MST-CAN, which we attribute to well-described referrals. Some of the families may require special attention during the treatment process to prevent a deterioration of parental mental health and address their needs with targeted interventions.

We conclude that in such a crucial area as child maltreatment, conducting complementary, person-oriented studies is worthwhile to gain a better understanding of the mental health needs of children and families. This understanding serves as a basis for matching them with tailored interventions.

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## SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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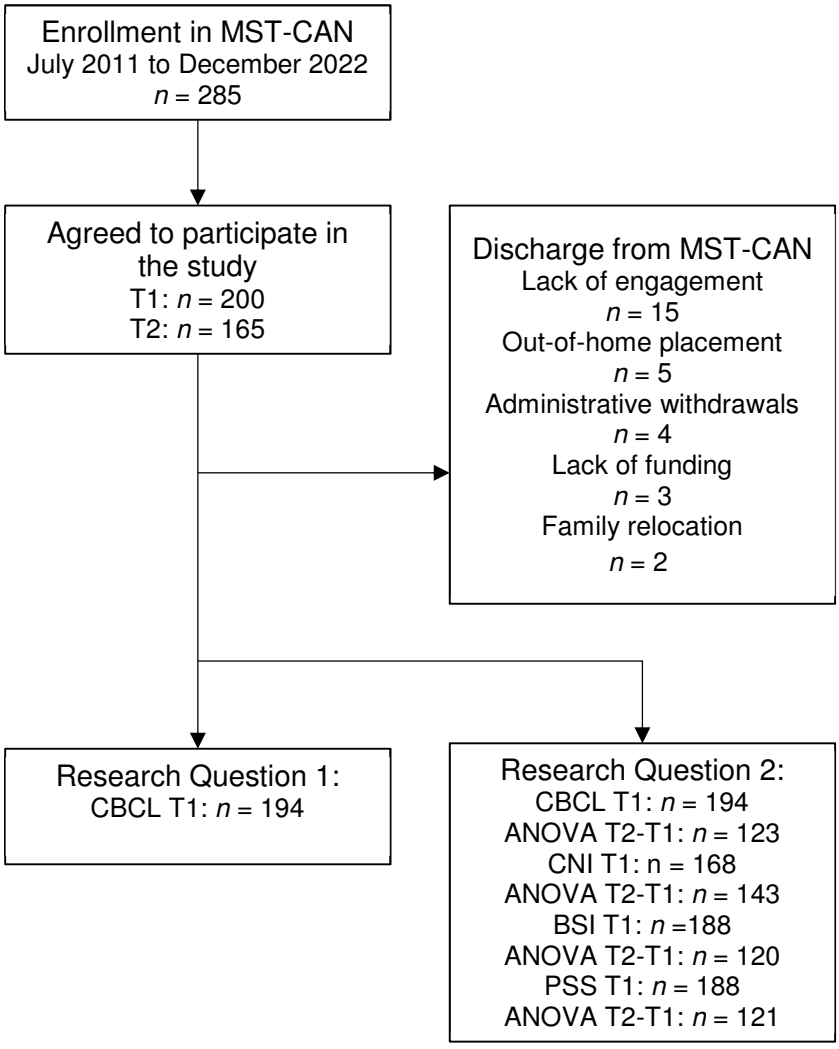
APPENDIX A. Flowchart depicting participation and analysis



APPENDIX B. Between group differences: Means and standard deviations of characteristics across 5 groups

| Measure | Group 1: *n* = 59 *M (SD)* | Group 2: *n* = 25 *M (SD)* | Group 3: *n* = 30 *M (SD)* | Group 4: *n* = 68 *M (SD)* | Group 5: *n* = 12 *M (SD)* | *F* | Tukey's HSD homogenic subgroups |
|---|---|---|---|---|---|---|---|
| Social Withdrawal | 65.85 (7.06) | 73.84 (9.57) | 62.83 (7.98) | 53.71 (8.58) | 75.00 (7.47) | 41.65* | 2, 5 > 1, 3 > 4 |
| Somatic Complaints | 63.75 (8.37) | 70.76 (8.67) | 54.53 (5.48) | 53.37 (4.87) | 74.50 (6.13) | 54.70* | 2, 5 > 1 > 3, 4 |
| Anxiety/ Depression | 65.85 (7.35) | 76.56 (5.94) | 65.20 (7.77) | 55.65 (6.02) | 72.75 (8.50) | 52.02* | 2, 5> 1, 3 > 4 |
| Social Problems | 60.39 (8.15) | 66.84 (8.79) | 70.07 (8.73) | 55.57 (6.58) | 68.17 (7.60) | 24.37* | 3, 5, 2 > 1, 4 |
| Thought Problems | 56.88 (7.56) | 75.04 (5.88) | 65.17 (9.05) | 52.57 (5.56) | 70.92 (8.15) | 61.88* | 2, 5 > 3 > 1, 4 |
| Attention Problems | 63.59 (8.23) | 72.40 (8.46) | 72.73 (6.27) | 55.72 (6.50) | 65.00 (5.69) | 41.16* | 2, 3 > 1, 5 > 4 |
| Delinquent Behavior | 59.97 (8.01) | 72.36 (7.12) | 68.07 (7.08) | 55.56 (5.39) | 55.00 (5.56) | 39.39* | 2, 3 > 1, 4, 5 |
| Aggressive Behavior | 63.83 (8.55) | 75.16 (6.03) | 71.07 (8.98) | 55.10 (5.68) | 54.25 (4.35) | 52.14* | 2, 3 > 1 > 4, 5 |

*Note.* * $p < .001$, General scores for CBCL scales are: Normal for T < 60, borderline clinical range for T between 60 and 63, clinical for T > 64

## Anhang C: Studie III

**Buderer, C**., Kirsch, T., Pérez, T., Swenson, C. C., & Schmid, M. (2024). *Differential treatment responses of maltreated and neglected children and adolescents following an evidence-based multisystemic intervention.* Manuscript submitted for publication.

# Differential treatment responses of maltreated and neglected children and adolescents following an evidence-based multisystemic intervention

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# Differential treatment responses of maltreated and neglected children and adolescents following an evidence-based multisystemic intervention

Limited studies have investigated differential treatment responses to family-based treatment programs and subgroup trajectories in youth in a high-risk context. This study pioneered an examination of Multisystemic Therapy for Child Abuse and Neglect (MST-CAN) and built on prior research that identified subgroups with different psychopathologies. Participants included 208 parent-child dyads enrolled in the MST-CAN evaluation in Switzerland. Parents reported their children's ($M_{age}$=10.27 years, 44.2% female, 98.6% White Caucasian) emotional and behavioral problems, case worker from the referral Child Protective Services on child neglect. Longitudinal data were examined to analyze the differential changes within the pre- and post-treatment subgroups. Linking of Clusters after removal of a Residue (LICUR) was used to link clusters across T1 and T2 to examine the trajectories. Overall, the treatment was highly effective. Subgroup analyses revealed beneficial effects in four of the five (80%) subgroups. Treatment was most favorable for children with externalizing symptoms. Children with multiple symptoms improved across various symptoms. Regarding specific symptoms, children with anxious-avoidant symptoms benefited. However, children with internalizing symptoms did not show significant changes. Furthermore, treatment was beneficial for children in the normative subgroup. Child neglect was reduced in three (60%) subgroups. The LICUR method revealed stability of the subgroups between T1 and T2 for children with externalizing and multiple symptoms, which indicated symptom class stability. MST-CAN reduced emotional and behavioral problems and child neglect in most families. Understanding children's differential treatment responses to complex treatment programs is essential to adequately address different needs.

Keywords: Multisystemic Therapy for Child Abuse and Neglect (MST-CAN); Child Behavior Checklist; treatment outcome; psychotherapy; subgroups; person-centered approach

## Introduction

Children and adolescents experiencing maltreatment in their families are at an increased risk of developing various mental health problems with broad comorbidities (Bürgin et al., 2023; Schmid et al., 2013). Substantial evidence shows associations between child maltreatment and externalizing and internalizing problems (Hunt et al., 2017; Jaffee, 2017; Mehta et al., 2021), psychopathology (Francis et al., 2023) and various mental health disorders, such as depressive and anxiety disorders, post-traumatic stress disorder, drug use, and suicide attempts (Jaffee, 2017; Mehta et al., 2021; Norman et al., 2012). However, associations between children's mental health difficulties and neglect are specifically understudied. Neglect and physical abuse may be more likely to be related to internalizing and externalizing behaviors, respectively (Dubowitz et al., 2002; Hildyard & Wolfe, 2002). Hence, further research is required on symptom exhibition among children in complex situations that involve different abuse typologies and may require tailored treatments (Hecker et al., 2019; Humphreys & Zeanah, 2015).

Currently, research on how treatment programs address the varying symptomatology of high-risk children and adolescents is scarce. In particular, complex treatments, such as Multisystemic Therapy for Child Abuse and Neglect (MST-CAN) (Swenson et al., 2010), must demonstrate their effectiveness and efficacy across various age groups, mental health issues, and family crises. These programs should target various psychopathologies in both children and adolescents, as well as parental factors, to improve parent-child interactions and reduce the risk of the (re-) occurrence of child abuse and neglect. For such manual-based treatments, understanding the patients and families who would benefit is important. However, meta-analytical studies have shown how challenging adherence to treatment is, and that adherence is not associated with treatment outcomes (Collyer et al., 2020; Webb et al., 2010). In addition, three MST studies have found strong associations between adherence to the MST

process and treatment outcomes (Huey et al., 2000; Schoenwald et al., 2008), which extended to legal records years after treatment (Schoenwald et al., 2009).

Differential treatment outcomes in high-risk children and adolescents are rarely investigated, although these studies have become increasingly important (Nagin & Odgers, 2010). Till date, meta-analytical studies have concentrated on the overall effectiveness of treatment programs such as recurrence of child maltreatment (Euser et al., 2015; Gubbels et al., 2019; van der Put et al., 2018). However, the heterogeneity of the families and complex interplay of risk factors suggest that binary outcomes could be expected and treatment outcomes could vary across multiple diverse factors.

***Differential treatment outcomes and trajectories of emotional and behavioral problems in children and adolescents undergoing interventions***

Based on meta-analysis and individual studies that examined differential treatment responses and trajectories in children and adolescents, children and adolescents with different symptom classes differently benefited from treatment and exhibited distinct trajectories (Keles et al., 2021; Pasalich et al., 2022; Weisz et al., 2017). According to a meta-analytical study, children and adolescents with anxiety, depression, externalizing symptoms, and multiple problems benefited most, least, moderately, and not significantly from psychological treatment, respectively (Weisz et al., 2017). However, these findings were not specific to high-risk children.

In the MST context, to our best knowledge, only four studies have examined differential treatment responses and change trajectories via different approaches. Keles et al. (2021) found heterogeneous trajectories of treatment responses among 1674 adolescents with serious and persistent antisocial behavior treated with MST in Norway. Mertens et al. (2017) investigated various treatment outcomes related to externalizing problem behaviors in 147 adolescents treated with MST in the Netherlands. They identified six subgroups, each with

different developmental trajectories. Of these, four subgroups benefited from treatment, one showed no changes, and one deteriorated. The authors emphasized the need for individualized treatment based on these results. Halliday-Boykins et al. (2004) examined 156 adolescents who had experienced a suicidal crisis and subsequently received MST. Based on adolescents' psychopathological symptoms, they identified five different developmental trajectories: high improvement, high unimprovement, borderline improvement, borderline unimprovement, and subclinical. Hence, contrary to the general assumption, youths with severe psychopathology were at risk of maintaining their symptoms at a high level and benefited less from treatment (Halliday-Boykins et al., 2004). Buderer et al. (2024) found five distinct symptom groups in children and adolescents from 194 families referred and treated with MST-CAN in Switzerland: (a) children with anxious-avoidant symptoms, (b) children with multiple symptoms, (c) children with predominantly externalizing symptoms, (d) children without psychopathological findings, and (e) children with mainly internalizing symptoms. This study provided preliminary evidence that children and families benefited equally with respect to the overarching goals of MST-CAN (the child still lived at home and went to school, there were no new charges against the parents and no new Child Protections Services (CPS) reports). However, differential treatment responses of emotional and behavioral problems within the subgroups and subgroup trajectories were not examined. Outside the MST context, Pasalich et al. (2022) investigated the differential treatment responses of adolescents with severe behavioral and mental health problems. In total, 487 youths and 682 parents were enrolled in an attachment-based and trauma informed parent program. Those with severe externalizing behavior benefited the most, whereas those with comorbid externalizing and internalizing problem behaviors showed only a partial or moderate response to the treatment. Most youths with moderate or low levels of externalizing and internalizing problem behaviors at baseline gradually improved. These studies suggested

that different groups of adolescents benefited from family-based treatments in various ways. However, these studies did not provide information on how symptoms changed. Only one study examined symptom change in families within a high-risk context. Zhang and Slesnick (2018) identified four classes of internalizing and externalizing behavior (internalizing only, externalizing only, comorbid, and normative) in children with substance-misusing parents who received family systems therapy. Follow-up results showed that after 18 months, children from the externalizing and comorbid classes were more likely to be in the normative and internalizing classes, respectively. This study indicated changes in symptom classes for certain groups; however, generalizable statements could not be made. Additionally, change trajectories might vary in different settings, modalities, and problems (Warren et al., 2010) and are not easily transferable. To the best of our knowledge, no previous study has examined differential treatment responses for child neglect, in particular, child neglect in families with multiple, complex needs. This study is the first to examine this topic for emotional and behavioral problems as well as child neglect.

***This study***

This study aimed to investigate changes in emotional and behavioral problems and the severity of child neglect in subgroups of children and adolescents treated with MST-CAN, both cross-sectionally and longitudinally, via a combination of variable-and person-centered approaches. For the person-centered approach, we followed Bergman and Magnusson (1997)'s theoretical assumptions for cluster analyses. We assumed heterogeneity in emotional and behavioral problems among the children and adolescents referred and treated with MST-CAN. We also hypothesized that there would be different treatment outcomes and trajectories for these subgroups. We understood that changes during treatment were complex, interactional processes between the children and adolescents and their families and context.

We assumed that there would be a meaningful structure underlying these change processes. Therefore, in a two-fold approach we investigated the following research questions:

1. Are there differential changes in emotional and behavioral problems and the severity of child neglect within pre- and post-treatment subgroups, following prior research?
2. Do subgroups (cluster) change between two assessment points?
    a. Which subgroups can we identify at the end of the treatment?
    b. Do similar or different subgroups emerge at each assessment point? (structural changes or stability)
3. Do children and adolescents who belong to a specific subgroup before treatment tend to belong to a similar or different subgroup after treatment? Are there developmental trends among individuals belonging to one subgroup that tend to change into another subgroup during treatment? (individual changes or stability)
4. If subgroups are identified at the end, what are the characteristics when comparing vis-à-vis?

## Methods

### *Participants and procedure*

Participants were 208 parent-child dyads from families referred to MST-CAN in Switzerland between 2011–2023 by CPS. Families were referred based on a report of physical abuse and/or neglect in the preceding 180 days, as documented by a social worker. Inclusion criteria of the intervention program were cases with the target child aged between 6 and 17 years, not acutely suicidal, homicidal, psychotic, or diagnosed with autism spectrum disorder level 2 or 3 (DSM; American Psychiatric Association, 2013), and living either with their families or in foster care with the prospect of being rapidly reunited with their family.

Cases that included active sexual abuse, severe domestic violence, and parental psychosis were excluded.

Target children and parents were invited to participate. Of the 313 families approached, 214 parents provided informed consent. Based on intervention dropouts, owing to lack of engagement (n=15, 7.0%), out-of-home placements (n=5, 2.3%), administrative withdrawals (n=4, 1.9%), lack of funding (n=3, 1.4%), and family relocation (n=2, 0.9%) (Appendix A), we excluded 26 parent-child dyads (12.1%). We further excluded six parent-child dyads with missing values. Hence, the final sample consisted of 208 parent–child dyads. These families were treated between 24 therapists. The number of treated families per therapist varied from one family (0.5%) to 32 families (15.4%). Families who dropped out did not differ significantly from those who completed the intervention program in terms of demographic measures (i.e., age, sex, and migration background), severity of initial child neglect, and children's emotional and behavioral problems.

Children's mean age was 10.27 years (*SD* = 3.5). Of the participants, 44.2% were girls. Furthermore, 98.6% were white Caucasian and 1.4% Asian. Of the families, 36.5% had a migration background. Additionally, 40.9% of the parents were unemployed, 50.5% were single parents, and 6.3% did not have a graduation degree. Furthermore, 43.3% of the families had more than one child. For 36.1% and 36.6% of the children, referral reasons were a confirmed or suspected case of parental neglect and abuse (physically, emotionally), respectively. For 27.3% of the children, a referral was made considering that the parents were noticeably overwhelmed, with maltreatment only being determined during treatment. More than half of the children (59.6%) showed a clinical range of emotional and behavioral problems.

### *Intervention*

MST-CAN, an evidence-based treatment program, was designed for families with children aged 6–17 years who had experienced physical abuse and/or neglect (Bauch et al., 2022; Buderer et al., 2020, Hefti et al., 2020; Swenson et al., 2010). Swenson et al. (2010) demonstrated its superiority over an Enhanced Outpatient Treatment in a randomized controlled trial (RCT) on diverse outcome measures at the child and parental levels. The MST-CAN model combined evidence-based systemic and cognitive-behavioral interventions with case management (e.g., attaining employment, budgeting, and applying for housing) within the family's living environment. For a further comprehensive understanding of the program and its nine core treatment principles, detailed descriptions can be found in Swenson et al. (2010), Swenson and Schaeffer (2018), and the MST-CAN manual (Swenson et al., 2011).

Treatment was led by a single therapist, who was part of a team, and was conducted in the homes of families with severe clinical needs. Families received two to three weekly treatment sessions for six to nine months. A child and adolescent psychiatrist provided pharmacotherapy if necessary. An on-call service (24 x 7) was available to manage any crises that occurred outside regular working hours. Weekly consultations were conducted with an MST-CAN expert to ensure adherence.

### *Data collection*

This study was approved by the local ethics committees (Ethikkommission Ostschweiz, Ethikkommission Nordwest- und Zentralschweiz). Data were collected from July 2011 to December 2018 in Thurgau and from November 2014 to November 2023 in Basel. Oral and written informed consent was obtained from under-aged participants and legal guardians, respectively. With the help of a research assistant, the participating parents and children completed various questionnaires at the beginning and end of the treatment. Severity of child

neglect was assessed externally via an interview with the case worker of the referring CPS at the beginning and end of the MST-CAN. The case worker reported the case characteristics and type and severity of maltreatment.

### *Measures*

#### *Childhood emotional and behavioral problems*

Children's emotional and behavioral problems were assessed via the Child Behavior Checklist (Achenbach, 1991; CBCL/4-18; Workgroup German Version of the Child Behavior Checklist, 1998) that comprised 113 items. Parents were asked if they had observed a specific behavior in their child and they reported on a 3-point Likert scale that ranged from "not true" (0), "somewhat true" (1), or "always or often true" (2). Items were summarized into eight subscales (social withdrawal, somatic complaints, anxiety/depression, social, thought, attention problems, and delinquent and aggressive behavior), two broadband scales (internalizing and externalizing), and a total score. For clinical purposes, the raw scores were converted into *T*-scores. For the three scales of internalizing, externalizing, and total problems, scores between 60–63 and >63 were considered borderline clinical range and clinical range, respectively. In this sample, the internal consistency for the total score was excellent, with Cronbach's $\alpha = 0.95$.

#### *Child neglect*

The Ontario Child Neglect Index (CNI; Trocmé, 1996) was used to measure the severity of neglect. The CNI comprised six items that reflected different forms of neglect (i.e., supervision, nutrition, clothing and hygiene, physical health, mental health, and development/educational care). Items were rated on a 4- to 5-level scale (i.e., "adequate," "inconsistent," "inadequate," and "seriously inadequate") by trained child welfare professionals. To calculate a total score that reflected the severity of neglect, the scale scores were summed and an age score ranged from 0 (13–16 years) to 20 (0–2 years) was added to

the highest score among the six scales. The underlying model assumed that the six neglect items represented different forms of neglect rather than different components that could be added together. The total score ranged from 0–80 points, and higher scores indicated more severe levels of child neglect. This study used an unpublished German version of the CNI (Pérez et al., 2017), which was approved by Trocmé based on a back-translation into English.

***Data analysis***

Descriptive statistics and frequency distributions were calculated for demographic characteristics. In a preliminary analysis, we conducted paired-sample *t*-tests for the CBCL total scale and two broadband scales (internalizing problems and externalizing problems) and the CNI to analyze changes in the means between T1 (pre-treatment) and T2 (post-treatment). To answer our first research question, we repeated these analyses for each subgroup, which included the eight CBCL subscales. We applied Bonferroni correction to obtain *p*-values.

To answer the second and third research questions, we followed the Linking of Clusters after removal of a Residue (LICUR) method (Bergman et al., 2003), which is a pattern-analytical procedure, forming clusters at each measurement point to determine the individual development between the clusters of the different measurement points (Daukantaitė et al., 2019; Schmid et al., 2021; Viborg et al., 2018). This method comprises three steps. First, for each measure point, the multivariate outliers are identified by means of a residue procedure and removed from further analyses to not distort the later cluster analyses. Second, Ward's hierarchical clustering method (Ward, 1963) and Squared Euclidean distances are performed for each measurement point. Optimal cluster solutions are chosen based on the content aspects and statistical criteria recommended by Bergman et al. (2003). In our cluster analyses, the operation factors were the eight CBCL subscales.

Third, the subgroup trajectories between the measurement points are investigated regarding structural and individual stability/change. Distances of the cluster centroids at T1

and T2 were analyzed and compared by calculating the squared Euclidian distances. Small and larger distances referred to high similarities and dissimilarity, which indicated structural stability and structural change, respectively. To analyze individual stability/change, the two cluster solutions were cross-tabulated and the number of transitions expected with those actually observed were compared. Significance was assessed via Fisher's exact test, with a hypergeometric distribution. To address mass significance, Bonferroni correction was applied. Observed paths that were significantly higher and lower than expected were referred to as developmental types and developmental antitypes that indicated that a transition was unlikely, respectively. Odds ratio (*OR*) was calculated to determine the extent to which the probability of a significant path increased (for developmental types; $OR > 1.0$) or decreased (for antitypes; $OR < 1.0$).

Finally, we compared the demographic variables of the T2 clusters to determine their specific characteristics vis-a-vis. For continuous variables, we performed a one-way analysis of variance with post hoc comparisons via Tukey's Honest Significant Differences. For nominal variables (sex, migration background, and single parenthood), we performed a chi-squared test.

IBM SPSS version 29 was used for data analysis. To analyze the individual development of the subgroups, we used the ExaCon module of the statistics package ROPstat 2.0 (Vargha et al., 2015).

## Results

### *Preliminary analyses*

*Changes in emotional and behavioral problems and child neglect (variable-centered)*

Paired sample *t*-tests were used to determine the average group changes over time. Significant changes were observed for emotional and behavioral problems and severity of child neglect (Tables 1 and 2).

*Changes in emotional and behavioral problems and severity of child neglect in the subgroups*

To determine the changes in emotional and behavioral problems and child neglect between T1 (pretreatment) and T2 (post-treatment) within each subgroup, t-tests were performed for the individual subgroups. Tables 1 and 2 present the results for the CBCL total scores and CBCL internalizing and externalizing problems and the CNI, respectively.

**[Insert Table 1 here]**

**[Insert Table 2 here]**

Figure 1 illustrates the mean changes for the CBCL subscales per group between T1 and T2. Results of descriptive statistics and *t*-tests for each subscale and subgroup are listed in Appendices B and C, respectively.

**[Insert Figure 1 here]**

***Group 1: Children with normative emotions and behavior.*** In this group (n=30), characterized by non-clinical scores at admission, the CBCL total scores decreased significantly from T1 to T2 (Table 1). Furthermore, significant changes were also observed in the CNI scores between T1 and T2 (Table 2).

***Group 2: Children with externalizing symptoms.*** This group (n=39) had elevated clinical scores for externalizing problems at admission. They benefited the most and demonstrated significant changes in the CBCL total score as well as the subscales for internalizing and externalizing problems (Table 1). The CNI scores also changed significantly (Table 2), which indicated the beneficial effects for MST-CAN. Furthermore, children's scores decreased significantly over time for the CBCL subscales of "social withdrawal," "anxiety/depression," "social problems," "attention problems," "delinquent behavior," and "aggressive behavior" (Figure 1, Appendices B and C).

***Group 3: Children with multiple symptoms.*** This group (n=17) reported high scores in a clinical range on all the subscales and met the criteria for the CBCL dysregulation profile,

which indicated severe psychopathology (Deutz et al., 2020; Dölitzsch et al., 2016). Beneficial effects were observed at a CBCL subscale level, although not for the CBCL total scores and CNI (Table 1 and 2). At the CBCL subscale level, scores decreased significantly over time for "somatic complaints," "anxiety/depression," "thought problems," "delinquent behavior," and "aggressive behavior" (Figures 1, Appendices B and C).

***Group 4: Children with anxious-avoidant symptoms.*** This group (n=32) was characterized by scores in a clinical range on the scales "social withdrawal" and "anxiety/depression." Significant changes were observed over time in the CBCL total score and internalizing problems (Table 1). Furthermore, the CNI score also changed significantly over time (Table 2). At a subscale level, scores decreased significantly over time for "social withdrawal" and "anxiety/depression" (Figure 1, Appendices B and C).

***Group 5: Children with internalizing symptoms.*** Children in this group (n=11) primarily exhibited internalizing problems with high scores in the clinical range for the subscales assigned to internalizing problems. No significant changes were observed over time in the CBCL, total score, or subscale scores (Table 1, Figure 1, Appendices B and C). Additionally, no significant changes were observed in the CNI (Table 2).

*Subgroup trajectories between T1 and T2*

To determine the trajectories of the subgroups, clusters were identified at T2 (LICUR steps 1 and 2). Subsequently, the clusters were compared with those identified at T1 (structural change), and their developmental paths between the two measurement points were analyzed (individual change) (LICUR step 3). Finally, the clusters identified at T2 were examined to distinguish between characteristics vis-à-vis.

***Identification of cluster at T2.*** We performed a cluster analysis at T2. No multivariate outliers were found as assessed by the Mahalanobis distance ($p > 0.001$). The five-cluster

solution (see Figure 2 and detailed results in Appendix D) was chosen owing to its content aspects and considering that it met Bergman et al.'s criteria (2003).

***Group 1: Children with normative emotions and behavior.*** The first and largest group (n=62) comprised children with low scores in the normal range across all subscales. Scores indicated that these children did not have psychopathological symptoms at the end of treatment with MST-CAN.

***Group 2: Children with internalizing problems.*** Children in the second group (n=14) scored in the clinical range on the subscales "somatic complaints," "anxiety/depression," "social problems," and "thought problems." These findings indicated a group with predominantly internalizing problems.

***Group 3: Children with socially withdrawn symptoms.*** The third group was the smallest (n=8). Children scored high on the subscale "social withdrawal" and in the borderline clinical range on the subscales "anxiety/depression" and "thought problems." All other scores were within the normal ranges. These results indicated that the children were socially isolated and withdrawn.

***Group 4: Children with oppositional, defiant symptoms.*** The fourth group (n=25) comprised children with scores in a clinical range for the subscales "attention problems" and "aggressive behavior." Additionally, scores were in a borderline clinical range for the subscales "social problems" and "delinquent" behavior." All other scores were within the normal ranges. These findings indicated to a clinical picture of children who were oppositional and defiant.

***Group 5: Children with multiple symptoms.*** The fifth group (n=19) scored high in the clinical range on all the subscales. The *T*-scores for the subscales of "anxiety/depression," "attention problems," and "aggressive behavior" were above 67. Therefore, children met the criteria for the dysregulation profile, which indicated that they still exhibited severe psychopathology at the end of treatment, despite significant reductions in "somatic

complaints," "anxiety/depression," "thought problems," "delinquent behavior," and "aggressive behavior." Detailed results regarding the subgroup profiles at T2 (means and standard deviations for the subscales) are presented in Appendix D.

**[Insert Figure 2 here]**

***Structural change.*** Figure 2 illustrates the two cluster solutions for T1 (pre-treatment) and T2 (post-treatment). We identified five similar patterns. Clusters were arranged horizontally based on their similarity to each other. There was a high structural stability between the clusters across the measurement points.

***Individual change.*** Figure 2 also illustrates the individual developmental paths between the clusters and the two measurement points. We identified three stable developmental types (transitions occurring with a high probability; solid arrows in Figure 2) for the clusters CL11 (children with normative emotions and behavior), CL12 (externalizing symptoms), and CL13 (multiple symptoms) in their respective corresponding clusters at the second measurement point. These findings indicated individual stability and suggested significant changes in the profiles for these groups. An additional developmental type that did not run between the two corresponding clusters was found, which indicated a profile change. This was between clusters CL15 (children with internalizing symptoms) and CL23 (children with socially withdrawn symptoms). Developmental antitypes (high probability of no transition occurring; dashed arrows in Figure 2) were found between dissimilar clusters, namely between CL11 (children with normative emotions and behavior) and CL25 (children with multiple symptoms), CL12 (children with externalizing symptoms) and CL21 (children with normative emotions and behavior), and CL13 (children with multiple symptoms) and CL24 (children with oppositional, defiant symptoms). These antitypes, were used as confirmation of the above-mentioned individual profile stability for children with normative emotions and

behavior, externalizing problems, and multiple systems between T1 and T2. These antitypes indicated the unlikeliness of a profile change.

***Subgroup characteristics (T2 subgroups).*** Investigation of the subgroup characteristics did not reveal any significant differences in demographic variables. Detailed results of the group comparisons are provided in Appendices E and F.

## Discussion

This study aimed to investigate the changes in emotional and behavioral problems, severity of child neglect, and subgroup trajectories among children and adolescents treated with MST-CAN. It utilized a dual approach that combined both variable-centered and person-centered methods. These findings provide novel evidence that children and adolescents differ in their responses to MST-CAN and show distinct subgroup trajectories. Of the five subgroups, four benefited from treatment and showed differential changes in emotional and behavioral problems, emphasizing the differential treatment responses of the subgroups according to their psychopathologies. Furthermore, three subgroups also showed reductions in child neglect, highlighting that most families benefited from treatment. The subgroups identified at the beginning of the treatment reappeared at the end, albeit with sharper symptoms. Additionally, three subgroups exhibited high individual stability, indicating stability of symptom classes over time for children with externalizing and multiple symptoms and stability of no symptoms for the children in the normative subgroup. Children with internalizing symptoms transitioned into a subgroup of children with social withdrawal symptoms. Results of differential treatment responses to family-based interventions were consistent with those of prior research, suggesting differential treatment responses among children and adolescents in high-risk families. Keles et al. (2021) found heterogeneous trajectories among adolescents with serious and persistent antisocial behaviors treated with MST in Norway. Mertens et al. (2017) discovered different treatment trajectories in

adolescents with externalizing behaviors. Outside the MST context, divergent treatment trajectories were observed among adolescents with severe behavioral and mental health problems assigned to an attachment-based and trauma-informed parent program (Pasalich et al., 2022). The findings for each of the five subgroups are discussed below.

The treatment was most effective in children with externalizing symptoms. Changes were observed in all scales, including child neglect, with the exception of one that measured emotional and behavioral problems. This result corresponds with those of Pasalich et al.'s (2022), in which adolescents with severe externalizing problems showed the fastest and largest improvement in treatment. Zhang and Slesnick (2018) concluded that family systems therapy is especially effective in reducing externalizing problem behavior when compared with a non-family focused control treatment. The favorable outcomes in children with externalizing symptoms in the present study could be attributed to the origin of the MST, which was primarily designed to treat adolescents with externalizing problems. Buderer et al. (2020) found that children with externalizing symptoms showed further marked improvements than a comparison group of those in residential care. These findings might provide initial indications that the outreach and/or systemic approaches are particularly effective for children and adolescents with externalizing symptoms (Boege et al., 2015; Zhang & Slesnick, 2018). However, only cautious indications can be considered.

Furthermore, children with externalizing symptoms had a high likelihood of remaining in the equivalent subgroup at the end of the treatment, indicating that they likely showed oppositional, defiant symptoms at the end. Zhang and Slesnick (2018) found a transition of adolescents from the externalizing class to the normative class 18-month post-treatment. However, the two different timelines cannot be compared with this study.

For children with multiple symptoms, the MST-CAN was beneficial for various emotional and behavioral subscales, although not for child neglect and overall scales, indicating some

symptom improvements. A parallel can be drawn from Pasalich et al.'s study (2022), which found a moderate treatment response with gradual improvements in a group of children with co-occurring externalizing and internalizing problems. Within the context of Weisz et al.'s meta-analysis (2017), our results appear promising in favor of MST-CAN being effective for children with severe psychopathology. In the meta-analysis, only small effects and no significant differences from zero were observed in children and adolescents with multiple symptoms. Further analyses of the subgroup trajectories revealed stability over time. This indicates that the children in this group still show signs of severe psychopathology even after treatment. This is consistent with Halliday-Boykins et al.'s study (2004), in which youths with severe psychopathology were at risk of maintaining their symptoms at a high level and benefiting less from treatment. These results indicate a particularly vulnerable subgroup of children.

Children with anxious-avoidant symptoms benefited in terms of their specific symptoms and child neglect. Research to draw parallels from studies with similar sample and group characteristics is lacking. Weisz et al. (2017) found the highest effects of psychological treatment for anxious children and adolescents. However, our findings are inconsistent with this perspective, which might be owing to the more complex nature of a high-risk sample. However, treatment was still beneficial in improving overall emotional and behavioral problems and reducing child neglect for children with normative emotions and behaviors. We attribute the existence of a normative group to the fact that children can remain resilient despite experiencing maltreatment or may develop symptoms only later in life (Fonagy et al., 2014). To the best of our knowledge, no previous research has contextualized these change values. However, Halliday-Boykins et al. (2004) found a subclinical group of youths following a psychiatric crisis; however, they were unable to further statistically analyze it due to the small group size. This normative group showed individual subgroup stability, which

may be evident and suggests that these children continue to remain resilient within the context of child abuse and neglect.

Children with internalizing problems did not benefit in terms of measured outcomes, which could indicate a non-responder group. We did not find supportive evidence that family-based therapy was not beneficial for children with internalizing symptoms in comparable samples. However, this result must be considered in light of the small subgroup size, which may bias the representativeness of the outcomes. Our second analysis revealed subgroup changes. Children with internalizing symptoms showed an increased likelihood of belonging to the subgroup of children with socially withdrawn symptoms after treatment. Studies to compare this result with are lacking. This result may suggest that social withdrawal as a specific symptom could not be adequately addressed during treatment or that these children and adolescents exhibit specific temperamental traits that make it difficult to reach them.

Our results regarding the differential treatment responses for reducing child neglect are particularly noteworthy. To the best of our knowledge, this is the first study to examine this. These results could provide an initial indication that children may benefit in different ways from a treatment program for maltreatment depending on their psychopathological symptoms. Further studies should examine the relationships between various psychopathologies and effects of treatment in children.

This study has several limitations. First, the study was not designed as an RCT, which restricts the generalizability of the results. Ultimately, we cannot conclude that the changes in children's psychopathology and neglect are attributable to the intervention program. However, with MST-CAN as a standardized treatment program executed in a natural setting with real treatment conditions, clinical representativeness and significance of the results is enhanced (Weisz et al., 2005). Although Switzerland has some legal peculiarities, these results can be generalized to other Western countries with similar ethnic and racial groups.

Second, we assessed children's psychopathology through parent reports via questionnaires. Previous studies (Buderer et al., 2024; Hefti et al., 2020) reported that a significant proportion of parents of families referred to the MST-CAN suffered from mental health problems, which could bias their reports regarding children's psychopathology (De Los Reyes & Kazdin, 2005). Furthermore, in a sensitive context, such as child protection, parents may be inclined to present themselves in a more favorable light (van de Mortel, 2008). Nevertheless, we followed a multi-informant approach (De Los Reyes et al., 2015) and engaged with an external professional caseworker involved with the families to assess child neglect and the existence and typology of child maltreatment. This was a strength of the study. However, future studies should consider additional assessments and methods.

Third, cluster analysis has some limitations. A significant limitation is the false-positive identification of clusters and tendency to discover two clusters in a dataset (Tokuda et al., 2022). Therefore, validation and replication of the identified 5-cluster solutions in datasets from other studies are essential. Furthermore, the cluster solution must be interpreted with caution. However, the Ward method was the only suitable method considering the exploratory nature of this study and sample size (Bacher et al., 2010). By applying the LICUR procedure as a more advanced method, a more sophisticated validation of clusters was possible, which is a strength of this study.

**Clinical implications**

The study's findings provide valuable insights for clinical practice and can assist clinicians in tailoring interventions for children's individual needs. Results on differential treatment responses emphasize the effectiveness of MST-CAN for children and adolescents with externalizing symptoms. MST-CAN primarily focuses on adult behavior in the treatment model. Interventions focused on parents include parenting skills (e.g., positive parenting strategies, establishing rules, and increasing the monitoring of their children), taking

responsibility and apologizing to the family for the maltreatment of the children, and creating and maintaining safety plans. Additionally, parents may participate in individual treatment to resolve their own trauma, decrease substance misuse, and learn skills to manage anger and implement family-based problem solving and communication. These treatment strategies and changes in parental behavior, combined with involvement of the natural ecology in social support, may be particularly helpful for children and adolescents in reducing externalizing symptoms. Furthermore, these results shed light on a particularly vulnerable subgroup of children and adolescents with multiple symptoms. These individuals should be identified early during treatment and may require additional care and intervention even after MST-CAN treatment. For these children and families, limiting the consequences of mental illness and collaborating with other help systems to provide the necessary assistance to ensure societal participation is crucial. Children and adolescents with internalizing symptoms may be at risk of not benefiting from treatment and exhibiting pronounced symptoms of social withdrawal at the end of treatment. To address their needs effectively, MST-CAN treatments to improve the parent-child relationship, additional social skills training with skill-building exercises (de Mooij et al., 2020), or youth-focused treatment might be helpful. Children without psychopathological symptoms also benefit from MST-CAN, which underscores the significance of treatment regarding the overarching goal of preventing and reducing child maltreatment. Parent and family changes may have a preventative function regarding mental health difficulties. In high-risk families where children experience mental health difficulties, focusing on the consequences and effects of child maltreatment and promoting resources may be helpful. Furthermore, this may serve as prevention for the recurrence of maltreatment.

## Conclusion

Our results highlight the effectiveness of MST-CAN for children and adolescents with differing mental health problems. These findings further support evidence that children and

adolescents differ in their response to multisystemic treatment within a high-risk context. Hence, future studies should incorporate person-centered methods in their analyses. In particular, for differential responses regarding the reduction of child neglect, this study may serve as a preliminary template and stimulate further research. Children who benefit lesser should be identified early during treatment and treated with additional interventions. For children with internalizing symptoms, social skills training might be beneficial to prevent them from developing socially withdrawn symptoms. Children with multiple symptoms may benefit from additional support, even after treatment, to reduce the long-term effects of severe psychopathology and limit societal participation. Our results contribute to a better understanding of the clinical needs of children and adolescents from families treated with MST-CAN. These results may also be of interest to other manualized treatment programs that target children and adolescents in a high-risk context, justifying standardized treatment programs.

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**Declaration of competing interests**

Dr. Cynthia Cupit Swenson serves as a consultant for the development of the MST-CAN programs through MST Services LLC, which has an exclusive licensing agreement with the Medical University of South Carolina for the dissemination of MST technology. The Medical University of South Carolina owns the intellectual property rights vis-à-vis the MST treatment model. The university receives royalties upon implementation of the treatment. The

Psychiatric University Clinics Basel implemented two MST-CAN teams in Basel-Stadt, Switzerland in 2014.

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Table 1. Descriptive analysis and paired-samples t-tests of the CBCL for the T1 subgroups and complete sample.

| Groups | CBCL total | | | | | CBCL internalizing | | | | | CBCL externalizing | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | T1 | T2 | | | | T1 | T2 | | | | T1 | T2 | | | |
| | *M (SD)* | | *t* | *df* | *p* | *M (SD)* | | *t* | *df* | *p* | *M (SD)* | | *t* | *df* | *p* |
| Complete Sample | 65.02 (9.58) | 59.27 (10.87) | 7.957 | 127 | .001*** | 63.59 (10.38) | 58.16 (11.00) | 6.396 | 127 | .001*** | 61.95 (10.29) | 57.27 (10.23) | 6.893 | 127 | .001*** |
| Group 1 | 52.10 (5.65) | 48.23 (8.11) | 2.936 | 29 | .036* | 50.10 (5.45) | 48.80 (8.47) | 1.106 | 29 | >.999 | 51.50 (7.20) | 48.47 (7.62) | 2.704 | 29 | .072 |
| Group 2 | 70.79 (4.01) | 63.28 (8.32) | 6.707 | 38 | .012* | 65.46 (7.97) | 59.36 (9.76) | 4.523 | 38 | 0.12* | 69.49 (4.44) | 61.36 (8.50) | 7.111 | 38 | 0.12* |
| Group 3 | 77.94 (4.25) | 69.63 (12.05) | 3.086 | 16 | >.999 | 76.63 (5.20) | 66.50 (10.13) | 3.154 | 16 | >.999 | 74.75 (5.54) | 66.81 (11.45) | 3.314 | 16 | .156 |
| Group 4 | 62.41 (3.80) | 58.22 (6.85) | 3.364 | 31 | .012* | 64.31 (4.35) | 58.53 (7.11) | 4.030 | 31 | .012* | 58.09 (6.73) | 56.13 (8.06) | 1.573 | 31 | .756 |
| Group 5 | 68.55 (2.66) | 64.55 (8.99) | 1.436 | 10 | >.999 | 72.73 (4.08) | 67.36 (12.68) | 1.383 | 10 | >.999 | 56.36 (6.23) | 56.18 (6.35) | 0.097 | 10 | >.999 |

*Note.* CBCL = Child Behavior Checklist. *M* = Mean, *SD* = Standard deviation. * $p < .05$, *** $p < .001$.
Group 1 = Children with normative emotions and behavior; Group 2 = Children with externalizing symptoms; Group 3 = Children with multiple symptoms; Group 4 = Children with anxious-avoidant symptoms; Group 5 = Children with internalizing symptoms.

Table 2. Descriptive analysis and paired-samples t-tests of the CNI for the T1 subgroups and complete sample.

| Groups | CNI | | | | |
|---|---|---|---|---|---|
| | T1 | T2 | | | |
| | *M (SD)* | | *t* | *df* | *p* |
| Complete Sample | 41.27 (19.68) | 25.99 (19.46) | 9.081 | 145 | .001** |
| Group 1 | 44.39 (17.36) | 28.90 (20.75) | 4.600 | 40 | .012* |
| Group 2 | 41.70 (21.51) | 25.23 (20.60) | 5.541 | 43 | .012* |
| Group 3 | 38.95 (16.21) | 30.53 (19.92) | 1.939 | 15 | .408 |
| Group 4 | 43.18 (19.99) | 25.30 (15.91) | 4.858 | 32 | .012* |
| Group 5 | 22.78 (19.22) | 9.44 (10.74) | 2.219 | 8 | .348 |

*Note.* CNI = Child-Neglect Index. *M* = Mean, *SD* = Standard deviation. * $p < .05$, ** $p < .001$.
Group 1 = Children with normative emotions and behavior; Group 2 = Children with externalizing symptoms; Group 3 = Children with multiple symptoms; Group 4 = Children with anxious-avoidant symptoms; Group 5 = Children with internalizing symptoms.

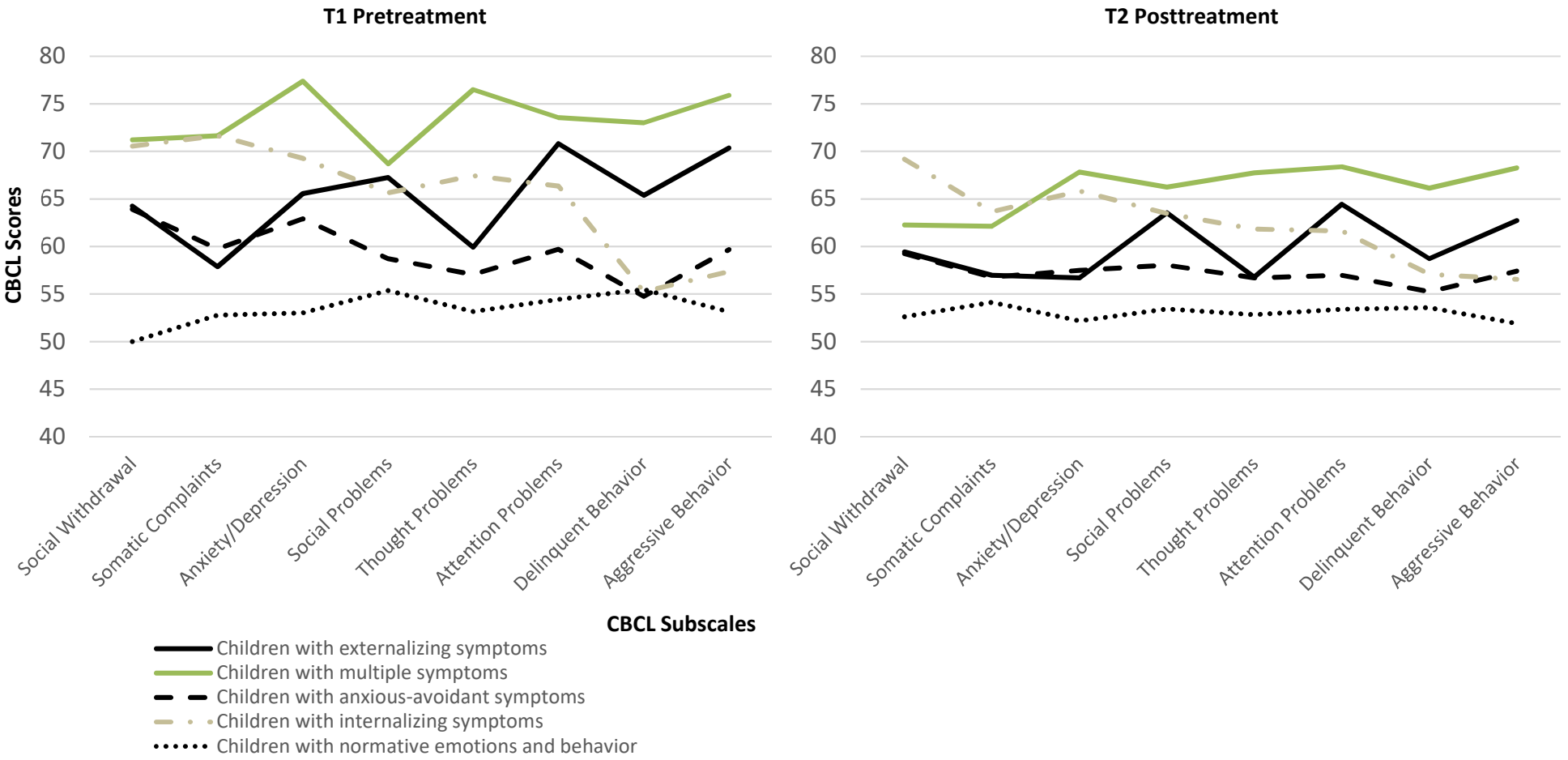
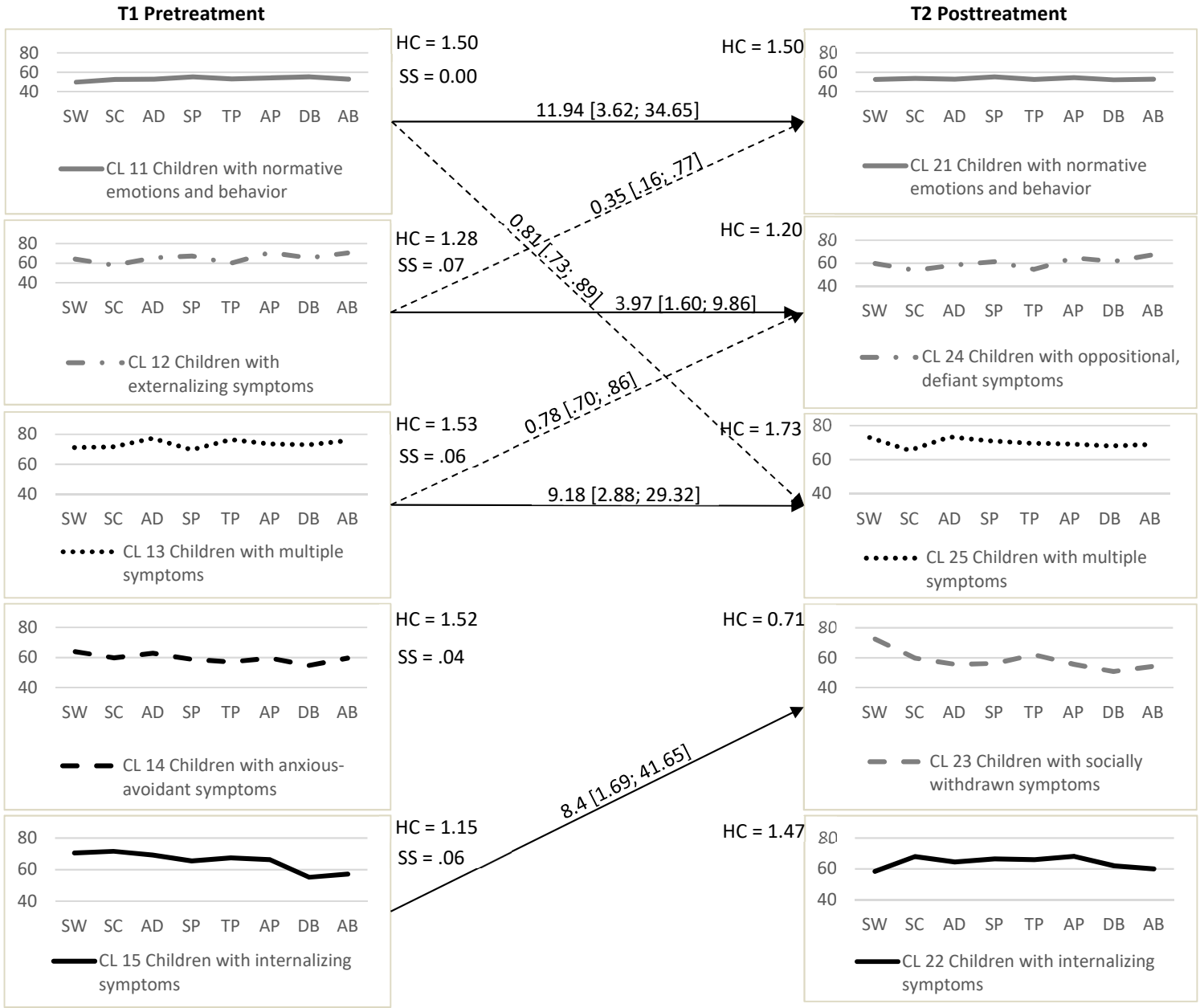



***Figure 1.*** *Changes in the CBCL subscale scores within the subgroups (CBCL profiles at T1) with paired samples t-tests at T1 and T2 (MST-CAN pre- and post-treatment). Significant changes observed for Children with externalizing symptoms (SW: t = 3.254, p = .012*, A/D: t = 4.253, p = .012*, SP: t = 2.992, p = .024*, AP: t = 5.475, p = .012*, DB: t = 5.516, p = .012*, AB: t = 6.261, p = .012*); Children with multiple symptoms (SW: t = 3.564, p = .012*, SC: t = 3.371, p = .024*, A/D: t = 3.473, p = .024*, TP: t = 3.336, p = .024*, DB: t = 3.445, p = .024*, AB: t = 3.173, p = .036*); Children with anxious-avoidant symptoms (SW: t = 3.049, p = .024*, A/D: t = 3.580, p = .012*)*

Note. CBCL = Child Behavior Checklist. SW = Social Withdrawal, SC = Somatic Complaints, A/D = Anxiety/Depression, SP = Social Problems, TP = Thought Problems, AP = Attention Problems, DB = Delinquent Behavior, AB = Aggressive Behavior. * $p < .05$.



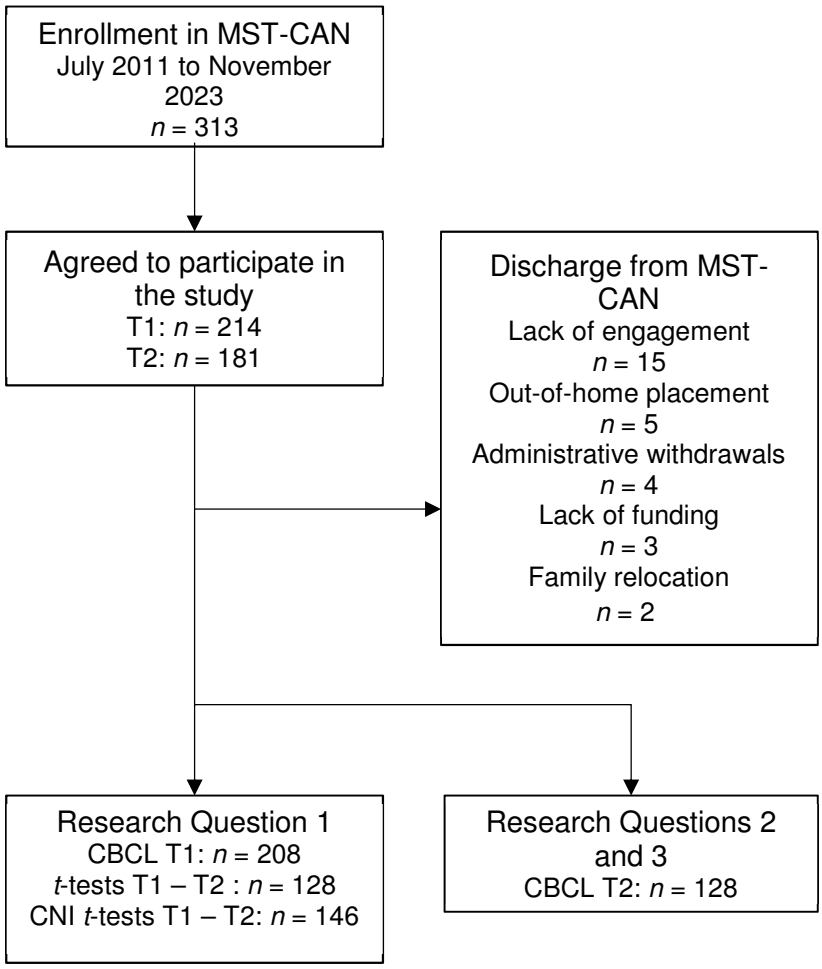

Results:

- High structural stability between clusters across T1 and T2, with $0.00 \leq SS \leq 0.07$.
- Profile stability for the three clusters CL11, CL12, and CL13 with their respective corresponding clusters at T2 (developmental types).
- Profile change for the cluster CL15 to CL23 (developmental type).
- Confirmed profile stability for dissimilar clusters CL11 and CL25, CL12 and CL21, and CL13 and CL24 (developmental antitypes).

***Figure 2.*** *Cluster centroids at T1 and T2 and the transitions.*
*Note. Operating factors: SW = Social Withdrawal, SC = Somatic Complaints, AD = Anxiety/Depression, SP = Social Problems, TP = Thought Problems, AP = Attention Problems, DB = Delinquent Behavior, AB = Aggressive Behavior. HC, Homegeneity coefficient (mean square Euclidian distance within the cluster). SS = Structural stability (mean square Euclidian distance between twin clusters).* ⟶ *Significantly more transitions* ⇢ *Significantly less transitions. The numbers next to the arrows represent the odds ratios (ORs) and 95% CIs (significantly more transitions: OR > 1.0; significantly less transitions: OR < 1.0).*

**Appendix A**

Flowchart depicting participation and analysis



## Appendix B

Descriptive analysis of the Child Behavior Checklist subscales for the subgroups (T1 profiles).

| Measure | Group 1 | | Group 2 | | Group 3 | | Group 4 | | Group 5 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | T1 | T2 | T1 | T2 | T1 | T2 | T1 | T2 | T1 | T2 |
| | *M (SD)* | | *M (SD)* | | *M (SD)* | | *M (SD)* | | *M (SD)* | |
| Social Withdrawal | 50.00 (9.60) | 52.60 (4.60) | 64.26 (8.09) | 59.44 (8.77) | 71.19 (7.85) | 62.25 (8.33) | 63.91 (5.99) | 59.25 (8.13) | 70.55 (7.31) | 69.18 (13.60) |
| Somatic Complaints | 52.77 (5.31) | 54.13 (7.21) | 57.87 (8.90) | 56.97 (9.49) | 71.63 (7.35) | 62.13 (10.26) | 59.75 (8.44) | 56.78 (6.79) | 71.64 (5.52) | 63.64 (11.47) |
| Anxiety/ Depression | 53.03 (4.37) | 52.17 (5.05) | 65.56 (8.64) | 59.69 (8.54) | 77.38 (6.60) | 67.81 (8.79) | 62.91 (6.51) | 57.50 (8.11) | 69.27 (6.18) | 65.82 (10.61) |
| Social Problems | 55.37 (7.00) | 53.43 (5.22) | 67.26 (8.44) | 63.54 (9.05) | 68.69 (8.35) | 66.25 (9.07) | 58.72 (7.78) | 58.03 (6.23) | 65.64 (8.78) | 63.45 (12.52) |
| Thought Problems | 53.17 (6.85) | 52.83 (5.82) | 59.92 (10.09) | 56.77 (7.25) | 76.5 (6.13) | 67.75 (10.46) | 57.06 (7.23) | 56.69 (7.77) | 67.45 (4.87) | 61.82 (7.77) |
| Attention Problems | 54.43 (5.90) | 53.40 (5.06) | 70.82 (6.44) | 64.44 (7.25) | 73.56 (9.37) | 68.38 (9.75) | 59.69 (6.42) | 56.97 (7.04) | 66.36 (5.48) | 61.64 (7.05) |
| Delinquent Behavior | 55.47 (5.39) | 53.57 (5.60) | 65.38 (6.60) | 58.72 (7.50) | 73.00 (7.52) | 66.13 (11.42) | 54.75 (5.59) | 55.25 (5.93) | 55.27 (6.71) | 57.09 (7.30) |
| Aggressive Behavior | 53.13 (4.08) | 51.90 (2.91) | 70.36 (6.56) | 62.72 (8.86) | 75.88 (7.15) | 68.25 (9.78) | 59.66 (6.71) | 57.41 (8.47) | 57.36 (5.80) | 56.55 (5.12) |

*Note.* General scores for the Child Behavior Checklist scales are normal for T < 60, borderline clinical range for T between 60 and 63, clinical for T > 64. *M* = Mean, *SD* = Standard deviation.
Group 1 = Children with normative emotions and behavior, Group 2 = Children with externalizing symptoms, Group 3 = Children with multiple symptoms, Group 4 = Children with anxious-avoidant symptoms, Group 5 = Children with internalizing symptoms.

## Appendix C

Paired-sample t-tests of the Child Behavior Checklist subscales at T1 and T2 (pre- and post-treatment) for the subgroups (T1 profiles).

| Measure | Group 1 | | | Group 2 | | | Group 3 | | | Group 4 | | | Group 5 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *t* | *df* | *p* | *t* | *df* | *p* | *t* | *df* | *p* | *t* | *df* | *p* | *t* | *df* | *p* |
| Social Withdrawal | -1.195 | 29 | >.999 | 3.254 | 38 | .012* | 3.564 | 15 | .012* | 3.049 | 31 | .024* | 0.313 | 10 | >.999 |
| Somatic Complaints | -1.072 | 29 | >.999 | 0.579 | 38 | >.999 | 3.371 | 15 | .024* | 1.880 | 31 | .42 | 2.178 | 10 | .324 |
| Anxiety/ Depression | 0.765 | 29 | >.999 | 4.253 | 38 | .012* | 3.473 | 15 | .024* | 3.580 | 31 | .012* | 0.993 | 10 | >.999 |
| Social Problems | 1.373 | 29 | >.999 | 2.992 | 38 | .024* | 1.047 | 15 | >.999 | 0.647 | 31 | >.999 | 0.602 | 10 | >.999 |
| Thought Problems | 0.282 | 29 | >.999 | 1.813 | 38 | .468 | 3.336 | 15 | .024* | 0.273 | 31 | >.999 | 2.946 | 10 | .084 |
| Attention Problems | 1.080 | 29 | >.999 | 5.475 | 38 | .012* | 2.746 | 15 | .096 | 2.588 | 31 | .084 | 1.755 | 10 | .66 |
| Delinquent Behavior | 1.460 | 29 | .924 | 5.516 | 38 | .012* | 3.445 | 15 | .024* | -.420 | 31 | >.999 | -0.731 | 10 | >.999 |
| Aggressive Behavior | 1.963 | 29 | .36 | 6.261 | 38 | .012* | 3.173 | 15 | .036* | 1.760 | 31 | .528 | 0.477 | 10 | >.999 |

*Note.* * $p < .05$.

Group 1 = Children with normative emotions and behavior, Group 2 = Children with externalizing symptoms, Group 3 = Children with multiple symptoms, Group 4 = Children with anxious-avoidant symptoms, Group 5 = Children with internalizing symptoms.

**Appendix D**

Between group differences: Means and standard deviations of characteristics across the five subgroups (T2 profiles).

| Measure | Group 1: *n* = 19 *M (SD)* | Group 2: *n* = 14 *M (SD)* | Group 3: *n* = 62 *M (SD)* | Group 4: *n* = 8 *M (SD)* | Group 5: *n* = 25 *M (SD)* | *F* | *p* |
|---|---|---|---|---|---|---|---|
| Social Withdrawal | 73.00 (7.96) | 58.43 (5.95) | 52.79 (3.49) | 72.50 (7.80) | 59.64 (5.26) | 67.95 | <.001 |
| Somatic Complaints | 65.47 (11.07) | 67.93 (8.78) | 53.85 (5.96) | 59.75 (9.44) | 53.80 (4.27) | 18.81 | <.001 |
| Anxiety/ Depression | 73.37 (5.61) | 64.43 (7.59) | 53.00 (4.71) | 62.63 (5.48) | 58.36 (7.95) | 46.77 | <.001 |
| Social Problems | 71.11 (10.14) | 66.50 (6.49) | 55.39 (6.09) | 56.13 (4.88) | 61.24 (7.43) | 22.04 | <.001 |
| Thought Problems | 69.74 (8.52) | 66.07 (9.89) | 52.66 (5.44) | 62.00 (4.14) | 54.64 (5.79) | 33.00 | <.001 |
| Attention Problems | 69.26 (9.13) | 68.14 (3.57) | 54.47 (5.20) | 55.75 (5.20) | 64.68 (6.65) | 34.61 | <.001 |
| Delinquent Behavior | 68.11 (8.74) | 62.00 (6.68) | 52.37 (3.21) | 50.88 (2.48) | 61.40 (6.75) | 39.56 | <.001 |
| Aggressive Behavior | 69.00 (9.26) | 60.07 (5.77) | 52.97 (4.06) | 54.25 (4.86) | 67.36 (7.82) | 40.67 | <.001 |

*Note.* General scores for the Child Behavior Checklist scales are normal for T < 60, borderline clinical range for T between 60 and 63, clinical for T > 64. *M* = Mean, *SD* = Standard deviation.
Group 1 = Children with multiple symptoms, Group 2 = Children with internalizing symptoms, Group 3 = Children with normative emotions and behavior, Group 4 = Children with socially withdrawn symptoms, Group 5 = Children with oppositional-defiant symptoms.

**Appendix E**

Chi-squared tests on pretreatment differences in characteristics across the five subgroups (T2 profiles).

| Characteristics | Group 1: *n* (%) | Group 2: *n* (%) | Group 3: *n* (%) | Group 4: *n* (%) | Group 5: *n* (%) | $X^2$ [95% CI] |
|---|---|---|---|---|---|---|
| Female | 30 (48.4%) | 5 (35.7%) | 3 (37.5%) | 10 (40.0%) | 10 (52.6%) | 1.65 [.809,.824] |
| Migration background | 21 (33.9%) | 4 (28.6%) | 5 (62.5%) | 8 (32.0%) | 7 (36.8%) | 3.07 [.551, .570] |
| Single parenthood | 33 (53.2%) | 5 (35.7%) | 4 (50.0%) | 10 (40.0%) | 15 (78.9%) | 8.51 [.066,.076] |
| Parent unemployed | 28 (45.9%) | 3 (21.4%) | 2 (25.0%) | 8 (32.0%) | 11 (57.9%) | 6.75 [.146, .160] |
| Parent without graduation | 5 (3.1%) | 0 (0%) | 0 (0%) | 1 (4%) | 2 (10.5%) | 8.21 [.375, .394] |
| Multiple children in the household | 26 (60.5%) | 6 (66.7%) | 4 (80.0%) | 10 (58.8%) | 9 (64.3%) | .913 [.937, .946] |
| Referral because of child neglect | 25 (54.3%) | 7 (77.8%) | 1 (20.0%) | 9 (47.4%) | 10 (66.7%) | 5.64 [.226, .242] |

*Note. M* = Mean, *SD* = Standard deviation.

Group 1 = Children with multiple symptoms, Group 2 = Children with internalizing symptoms, Group 3 = Children with normative emotions and behavior, Group 4 = Children with socially withdrawn symptoms, Group 5 = Children with oppositional-defiant symptoms.

**Appendix F**

One-way analysis of variance (ANOVA) of the pre-treatment differences in age across the five subgroups (T2 profile).

| Measure | Group 1: *M (SD)* | Group 2: *M (SD)* | Group 3: *M (SD)* | Group 4: *M (SD)* | Group 5: *M (SD)* | *F* | *p* |
|---|---|---|---|---|---|---|---|
| Age | 9.98 (3.36) | 9.93 (3.63) | 12.75 (2.66) | 8.86 (2.97) | 10.37 (2.93) | 2.309 | .062 |

*Note. M* = Mean, *SD* = Standard deviation.

Group 1 = Children with multiple symptoms, Group 2 = Children with internalizing symptoms, Group 3 = Children with normative emotions and behavior, Group 4 = Children with socially withdrawn symptoms, Group 5 = Children with oppositional-defiant symptoms.

## Anhang D: Curriculum Vitae

### Corinna Buderer

### Education / Degrees

| | |
|---|---|
| 09/2023-11/2023 | Training in scientific writing at the department of Child and Adolescent Psychiatry, Psychiatric University Clinics Basel, Switzerland, PD Dr. J. Barth |
| 03/2023-05/2023 | Training in Acceptance and Commitment Therapy for children and adolescents, online training, T. Cordshagen-Fischer |
| since 12/2022 | PhD in Psychology at the Technical University Kaiserslautern, Landau, Germany<br>Supervisor: Prof. Dr. T. In-Albon, PD Dr. M. Schmid |
| 10/2021-01/2022 | Training in Schema Therapy for children and adolescents at the Psychiatric University Clinics Basel, Switzerland, Dr. C. Loose, M. Achermann |
| 06/2021 | Good Clinical Practice Training (GCP) at the University Basel, Switzerland |
| 03/2019 | Certificate in postgraduate education in systemic and cognitive-behavioral psychotherapy for children and adolescents, Institute of psychotherapy for children and adolescents (IPKJ), Universities of Basel, Bern, Zürich, Switzerland |
| 08/2015 | Master of Science (M.Sc.) in Psychology, Albert-Ludwigs-Universität Freiburg, Germany<br>Supervisor of Master Thesis: Prof. Dr. B. Tuschen-Caffier, Dr. J. Schmitz |
| 07/2013 | Bachelor of Science (B.Sc.) in Psychology, Albert-Ludwigs-Universität Freiburg, Germany<br>Supervisor of Bachelor Thesis: Prof. Dr. U. Halsband, Dr. R. Wohlfarth |
| 09/2003 | Bachelor of Arts (B.A.) in Business Administration at the Berufsakademie Lörrach, Germany |

### Work Experience

| | |
|---|---|
| since 11/2020 | Clinical Co-Head, Home Treatment for children and adolescents, Clinic of Child Adolescent Psychiatry and Psychotherapy, Psychiatric Services Aargau AG |
| 07/2017-11/2020 | Psychotherapist, Multisystemic Therapy for Child Abuse and Neglect, Department of Child and Adolescent Psychiatry, Psychiatric University Clinics Basel, Switzerland |
| 09/2015 – 06/2017 | Clinical assistant psychologist and research assistant, Multisystemic Therapy for Child Abuse and Neglect, Department of Child and Adolescent Psychiatry, Psychiatric University Clinics Basel, Switzerland |
| 10/2014 – 07/2015 | Research assistant, research department of Child and Adolescent Psychiatry, Psychiatric University Clinics Basel, Switzerland |
| 06/2014 – 09/2014 | Research internship, Research department of Child and Adolescent Psychiatry, Psychiatric University Clinics Basel, Switzerland |

| | |
|---|---|
| 08/2012 – 10/2012 | Clinical Internship, Child and Adolescent Psychiatry, St. Elisabethen Hospital Lörrach, Germany |
| 09/2003 – 12/2011 | Managing director, family-owned retail business Reitsport Buderer, Nimburg, Germany |
| 07/2002 – 09/2002 | Internship, Human Resources Department of the Clark Atlanta University, Atlanta, Georgia, USA |

## Research Projects

| | |
|---|---|
| since 05/2022 | Project Manager, Evaluation study of the Home Treatment for children and adolescents, Clinic of Child Adolescent Psychiatry and Psychotherapy, Psychiatric Services Aargau AG |

## Research Output List

Publications in peer-reviewed scientific journals:

**Buderer, C.**, Kirsch, T., Pérez, T., Swenson, C. C., Fürstenau, U., Rhiner, B., & Schmid, M. (2024). Child and family characteristics in multisystemic therapy for child abuse and neglect (MST-CAN): Are there associations with treatment outcome? *Journal of Marital and Family Therapy, 50*, 453–476.

**Buderer, C.**, Hefti, S., Fux, E., Pérez, T., Swenson, C. C., Fürstenau, U., Rhiner, B., & Schmid, M. (2020). Effects of Multisystemic Therapy for Child Abuse and Neglect on severity of neglect, behavioral and emotional problems, and attachment disorder symptoms in children. *Children and Youth Services Review, 119*, 105626.

Schröder, M., Pérez, T., **Buderer, C.**, & Schmid, M. (2017). Bindungsauffälligkeiten und psychische Belastung bei Kindern aus der Pflegekinderhilfe und Heimerziehung. *Kindheit und Entwicklung, 26*(2), 118-126.

Contribution to books:

**Buderer, C.**, Schreiner, V. & Wohlfarth, R. (2015). Beneficial effects of pet ownership on human health: The influence of caretakers' attachment style and personality as well as dog' personality and behavior (pp. 285-300). In: *D. Emmans & A. Laihinen (Eds.)*. Comparative Neuropsychology and Brain Imaging. Wien: Lit Verlag.

Submitted but not yet accepted:

**Buderer, C**., Kirsch, T., Pérez, T., Swenson, C. C., & Schmid, M. (2024). *Differential treatment responses of maltreated and neglected children and adolescents following an evidence-based multisystemic intervention.* Manuscript submitted for publication.