



Changing intergenerational patterns of emotional dysregulation in families with perinatal borderline personality disorder

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Abstract

A pilot study with women with borderline personality disorder (BPD) and their infants showed promising results. This clinical research program sought to discover whether ongoing implementation confirmed preliminary results in relation to maternal mental health and, in addition, whether parenting and the mother-infant relationship showed sufficient improvement. Women with BPD and their infants were referred to a 25-week group program of Mother-Infant Dialectical Behavior Therapy (MI-DBT). During groups, infants were provided care by childcare workers while mothers took part in a skills training session. Mothers and infants then reunited and took part in an activity together that incorporated skills taught in the teaching session. Sixty-nine of 98 women commencing MI-DBT completed the program, demonstrating a 71% completion rate. Women showed improvement on all measures of mental health including depression, anxiety, and BPD symptoms. While women reported improvement in parenting confidence, an objective measure of the mother-infant relationship showed continuation of concerning relationships in a significant percentage. MI-DBT was found to be effective at improving mothers' mental health, both at the initial site and in community settings, with different clinicians and with different childcare options. While there were some improvements found in measures of the mother's perception of the infant-parent relationship, there were no significant improvements in currently used observational measures of the interaction or the infant's social-emotional development, suggesting that additional intervention such as infant-parent therapy may be needed to augment the benefits of MI-DBT to improve outcomes in these areas.

Keywords Borderline personality disorder · Perinatal · Infant · Dialectical behavior therapy · Mother-infant · Outcome

Introduction

There is a high prevalence of borderline personality disorder (BPD) in general psychiatric populations. Ellison et al. (2018) describe rates of approximately 10–12% in mental health outpatient settings and 20–22% in inpatient wards. Co-morbidities between BPD and many common mental health conditions such as depression and anxiety occur frequently (Shah and Zanarini 2018). Perinatally, rates of depression and anxiety are consistently found to be at least 15% within birthing populations (Howard et al. 2014), yet only a handful of researchers have published on perinatal

BPD—its identification and its management. Studies of perinatal populations which seek to identify BPD find it a common diagnosis (Judd et al. 2019; Yelland et al. 2015). Howard et al. (2014) suggest a 6% incidence of personality disorder including BPD in perinatal populations.

Several summaries have delineated concerns about the impact of maternal BPD on offspring, from infancy (Eyden et al. 2016; Gratz et al. 2014) through childhood (Macfie 2009) to early adult life (Lyons-Ruth et al. 2013; Mahan et al. 2018). A recent review (Steele et al. 2019) demonstrates clearly the many problems faced by the offspring of parents with BPD. However, as this condition is seemingly under-diagnosed in perinatal populations, there is also very little published guidance on treatment programs for women with perinatal BPD, even taking into account diagnostic issues—complex trauma for instance as a diagnosis has overlaps with BPD. Thus, very little is known about the effects of interventions on this population group. Wilson and Donachie (2018) offered dialectical behavior therapy (DBT)

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to 21 perinatal women, 14 of whom completed the course. While there was a significant reduction in distress, and an improvement in confidence and ability to regulate emotion from commencement to finish of the 12-session group, only 44% had a unitary or co-morbid diagnosis of complex PTSD. BPD is not mentioned as a diagnosis nor is there a measure reported of changes to parenting or relationship with infant. An additional program providing benefit to high-risk and vulnerable parents, although not necessarily to mothers with BPD, was reported by Byrne et al. (2019). Their Lighthouse program uses an adaptation of mentalization-based therapy for personality disorders (Bateman and Fonagy 2013) in order to improve both the parent's and child's attachment styles. This 20-week group therapy program aims to help parents make sense of, and positively influence, misunderstandings with their children and foster an active curiosity about their child's inner world as well as to reflect on their own thoughts, feelings, and reactions. Pilot findings suggest the program is effective in improving both parenting confidence and sensitivity (Byrne et al. 2019).

A recent review of treatment programs for perinatal BPD (Florange and Herpertz 2019) identified 3 further studies which focused on helping patients identified with perinatal BPD specifically. Renneberg and Rosenbach (2016) have explored the feasibility and acceptability of a parenting-skills program developed specifically for mothers with BPD. The program is based on dialectical behavior therapy (DBT; Linehan 2015) and adapted to focus specifically on parenting. The mothers and therapists report very good acceptability but no results of the effectiveness for reducing maternal symptomatology, improving the mother-infant relationship or fostering child development. McCarthy et al. (2016) also report on the development of a program to help improve parenting in parents with BPD. The 3 strategic arms of this program can be delivered at a minimum of 3 sessions or extended by agreement to other services and interventions offered by Project Air for up to 4 months. Early results report good clinician acceptability and engagement but no publications could be accessed regarding changes to parenting behaviors or child outcomes. The third, undertaken by the current authors (Sved Williams et al. 2018) reports pilot results of an adaptation of DBT, mother-infant DBT (MI-DBT). As well as reporting good retention by the attendees at the first 4 groups, a significant improvement is noted in all measures of mental health explored including depression, anxiety, and borderline personality disorder symptomatology and also in parenting confidence and the infant-parent relationship, using the CARE Index. Florange and Herpertz (2019) note that there were no assessments which included child well-being, and therefore it was not possible to show evidence of preventive efficacy.

Given the evidence of improvement in at least maternal mental health and well-being, and with few other authors

providing guidance on treatment pathways for perinatal BPD women and their infants, MI-DBT has continued to explore whether improvements are consistently seen in the mother's mental health as well as her parenting, and with additional evaluation of impact on child outcomes. The program expanded to community sites because of referral demand. This article will highlight results from the ongoing clinical research in four separate community settings, with an additional focus on child outcomes.

Method

Participants and procedure

Eleven MI-DBT groups were completed between November 2013 and March 2020. Eight of these were conducted at Helen Mayo House (HMH), an inpatient psychiatric mother-baby unit (MBU) utilized as a facility for mothers from the community to attend MI-DBT, and three groups held in community children's centers. HMH clinicians provided supervision to mental health clinicians based at community sites to ensure program fidelity for skills-based aspects of MI-DBT.

To participate in MI-DBT, women were required to have at least one child under the age of 3 years and, in addition, to have been clinically diagnosed with BPD or have substantial emotional dysregulation related to traits of BPD and the referring clinician was concerned about mother-infant relationship quality. Women who did not speak English, had insufficient cognitive capacity to understand the concepts being discussed, or had significant substance abuse problems were excluded. Referrals were received from a range of services involved in supporting mothers and their infants including inpatient units, community mental health teams, general practitioners, private psychologists and psychiatrists, community-based organizations, and child protection services. Written informed consent was provided by participants and study procedures were approved by the Women's and Children's Health Network Human Research Ethics Committee.

MI-DBT program

MI-DBT has been adapted from evidence-based DBT (Linehan 1993) and involves a weekly 2.5-h group skills-based session, for 25 weeks. DBT teaches skills in mindfulness, distress tolerance, emotion regulation, and interpersonal effectiveness. MI-DBT has been adapted to address these issues within the parenting context and to provide skills for the mother to support her infant's own social and emotional development. While the mother undertakes the formal DBT skills group learning session,

her infants are cared for nearby by either staff or volunteers at HMH, using consistent primary-caregiver principles, or by childcare workers at the community sites by trained childcare practitioners. At the conclusion of each group session, mothers are reunited with their infants using structured activities and utilizing DBT skills the mothers have just learned in the formal group session, focusing particularly on the stresses of separation and reunion.

Measures

A variety of measures (see Table 1 for summary and reference details) were used in order to assess maternal and infant outcomes. Maternal mental health: Edinburgh Postnatal Depression Scale, Beck Anxiety Inventory, Borderline Symptom List 23 and the McLean Screening Instrument for BPD. Maternal coping strategies: DBT-Ways of Coping Checklist. Maternal parenting capability: Parenting

Table 1 Measures administered to MI-DBT participants pre- and post-group

Measure name	Abbrev	Rater	Number of items	Description	Reference
Maternal mental health					
Edinburgh Postnatal Depression Scale	EPDS	SR	10	Measures depressive symptoms during pregnancy and the postnatal period; higher scores = greater depression	(Cox et al. 1987)
Beck Anxiety Inventory	BAI	SR	21	Measures symptoms of anxiety; higher scores = more anxiety	(Beck et al. 1988)
Borderline Symptom List 23	BSL-23	SR	23	Measures symptoms of BPD; higher scores = greater symptomology	(Bohus et al. 2009)
McLean Screening Instrument for BPD	MSI-BPD	SR	10	Yes/no questions based on the BPD module of the Diagnostic Interview for DSM-IV personality disorder; higher scores = more symptoms	(Zanarini et al. 2003)
Maternal coping strategies					
DBT-Ways of Coping Checklist	DBT-WCCL	SR	59	Measures the use of DBT skills via functional and dysfunctional subscales; higher scores = more problematic behavior	(Neacsiu et al. 2010)
Maternal parenting capability					
Parenting Sense of Competence Scale	PSOC	SR	17	Measures maternal satisfaction (anxiety, motivation, frustration) and efficacy (competence, capability levels, problem-solving ability); higher scores = improved functioning	(Johnston and Mash 1989)
Parental Reflective Functioning Questionnaire	PRFQ	SR	39	Measures maternal capacity to reflect on her own, and her child's, internal mental experiences; higher scores = better ability	(Luyton et al. 2017)
Parenting Stress Index – short form	PSI-4 SF	SR	36	Identifies issues in parenting leading to increased stress and problems in the child's or mother's behavior; higher scores = more stress	(Abidin 2012)
Mother-infant interactions					
Nursing Child Assessment Satellite Training, Teaching Scale 2 nd Ed	NCAST	obs	73	An observation and rating scale of mother-infant interaction during a structured teaching situation; items represent a behavioral description that is scored as present or absent	(Oxford and Findlay 2013)
Child social-emotional development					
Ages & Stages Questionnaire Social Emotional Index	ASQ-SE2	SR	Age dependent	Mothers rate their children in 7 areas: self-regulation, compliance, adaptive functioning, autonomy, affect, social-communication and interaction with people; higher scores = poorer outcome	(Squires et al. 2015)

SR self-report, obs observer rated

Sense of Competence Scale, Parental Reflective Functioning Questionnaire, Parenting Stress Index. Mother-infant interactions: Nursing Child Assessment Satellite Training, Teaching Scale 2nd edition. Child social-emotional development: Ages & Stages Questionnaire Social-Emotional Index.

Statistical analysis

Descriptive statistics were reported for mother and child's age, child's sex, and socio-economic status (SES). Given the non-parametric nature of the data, the Wilcoxon signed rank test was used to determine pre- and post-group outcomes. The Index of Relative Socio-economic Advantage and Disadvantage was obtained from census data in order to measure SES. The Australian Bureau of Statistics (2016) provides decile ratings for all suburbs (1 to 10, indicating low [1–3], medium [4–7], to high SES [8–10]) based on a broad variety of economic and social markers. Pearson correlation effect sizes were calculated in order to determine the magnitude of the change between pre- and post- group scores, with $r=0.10$, 0.30 , and 0.50 indicating small, medium, and large changes, respectively (Cohen 1992). Small numbers for individual groups did not justify separate analysis so all participants who provided pre and post data are included together.

Results

Ninety-eight women have undertaken MI-DBT since 2013, with 69 completing, equating to a 71% completion rate. Pre- and post-group data in the form of semi-structured interviews ($N=60$; not reported in current paper), questionnaires ($N=58$), and NCAST video-recorded mother-infant interactions ($N=48$) have been collected from participants. Women with BPD often lead highly dysregulated lives, making data collection challenging; thus, the results to follow will focus only on those women who have completed either questionnaires or the NCAST, at both pre- and post-group evaluations ($N=69$).

The mean age for women was 30.0 years ($SD=5.6$, range = 20.4–45.0 years) and infants were, on average, 15.3 months ($SD=8.1$, range = 1–32.8 months) of age with 36 females and 41 males (total $N=77$). Based on Australian Bureau of Statistics data, the majority of participants lived in low socio-economic areas ($N=32$), with fewer in medium ($N=26$) and high ($N=11$) socio-economic areas. Eight women repeated all or part of the program for a variety of reasons including previous failure to complete when a second infant was born, or they were unable to attend for illness-related reasons. Attrition analyses show that scores on the EPDS, BAI, and BSL-23 at group commencement were not significantly different between women who completed the course and those who

did not, indicating that women who did not complete the program were not experiencing greater mental health difficulties at group commencement.

Maternal mental health

Table 2 shows that there were significant improvements in all measures of maternal health, with women reporting fewer symptoms of depression (EPDS; $p=0.000$), anxiety (BAI; $p=0.002$), and BPD symptoms as measured by the Borderline Symptom List 23 scale: total symptoms ($p=0.000$) and supplemental behavioral items ($p=0.007$). Moreover, moderate to large effect sizes for each of these measures (r_{range} , -0.36 to -0.52) were found.

Use of DBT skills

At the conclusion of the MI-DBT group, women used positive DBT skills more frequently, and dysfunctional behaviors less often, than before the group. The findings for each of the three subscales of the DBT Ways of Coping checklist (adaptive skills use, maladaptive general dysfunction, blaming others) were statistically significant and, moreover, a large effect ranging from -0.59 to -0.65 was found for each (see Table 2).

Parenting capability measures

Similarly, results on measures of parental capability as assessed by the Parenting Sense of Competence scale were significant, with moderate to large effects found for the overall measure and each of the three subscales. Overall, mothers reported increased feelings of competence after the group ($M_{\text{post}}=59.0$; $SD=13.0$) compared to before ($M_{\text{pre}}=52.6$; $SD=12.9$). In terms of the subscales, mothers reported feeling greater levels of self-efficacy ($p=0.000$), satisfaction derived from the parenting role ($p=0.006$), and interest in parenting ($p=0.005$) post-group.

An increase in scores on the Pre-Mentalizing Mode and Interest and Curiosity in Mental States subscales of the Parental Reflective Functioning Questionnaire showed that mothers' ability to mentalize about the intentions and mind states of their infants had also improved. Mothers made fewer malevolent attributions about their child's behavior ($p=0.002$; $r=-0.41$) and were more interested in the way their child behaved and felt ($p=0.000$; $r=-0.59$).

The extent of parent-child dysfunctional interactions was the only subscale on the Parenting Stress Index which was significant ($p=0.016$), indicating that the mother viewed her child as less of a negative element in her life, although the effect size was small ($r=-0.06$). Nevertheless,

Table 2 Comparison of pre- and post-group scores for women completing MI-DBT

		<i>n</i>	Pre-group <i>M</i> (<i>SD</i>)	Post-group <i>M</i> (<i>SD</i>)	<i>p</i>	<i>Z</i>	<i>r</i>
Maternal mental health							
EPDS:	Depression	58	16.2 (5.9)	13.0 (5.5)	.000	-3.925	-0.52
BAI:	Anxiety	57	28.0 (13.5)	22.7 (11.8)	.002	-3.085	-0.41
BSL-23:	Total BPD symptoms	58	43.0 (18.0)	32.2 (18.7)	.000	-3.876	-0.51
	Supplemental behavioural items	56	4.6 (3.9)	3.3 (3.0)	.007	-2.682	-0.36
MSI-BPD:	Identification with BPD traits	57	7.1 (2.7)	5.9 (3.0)	.000	-3.765	-0.50
Use of DBT skills							
DBT-WCCL:	Use of adaptive DBT skills	33	1.5 (0.5)	1.8 (0.4)	.001	-3.386	-0.59
	Maladaptive general dysfunction	33	2.0 (0.6)	1.7 (0.5)	.000	-3.710	-0.65
	Blaming others	33	1.6 (0.7)	1.2 (0.7)	.001	-3.375	-0.59
Maternal parenting capability							
PSOC:	Sense of competence (total)	52	52.6 (12.9)	59.0 (13.0)	.000	-4.080	-0.57
	Efficacy	52	15.9 (6.0)	19.0 (5.3)	.000	-3.774	-0.52
	Satisfaction	52	16.8 (5.4)	18.9 (6.1)	.006	-2.732	-0.38
	Interest	52	13.2 (2.9)	14.1 (3.1)	.005	-2.838	-0.39
PRFQ:	Reflective functioning (pre-mentalizing)	55	2.4 (1.1)	2.1 (0.9)	.002	-3.056	-0.41
	Interest and curiosity in mental states	55	5.5 (0.9)	5.9 (0.8)	.000	-4.357	-0.59
PSI:	Total stress	32	95.2 (22.6)	91.1 (23.6)	.203	-1.272	-0.22
	Parental distress	32	40.6 (6.5)	38.5 (8.7)	.116	-1.571	-0.43
	Parent-child dysfunctional interaction	32	26.5 (8.9)	24.1 (7.8)	.016	-2.408	-0.06
	Difficult child	32	27.9 (10.3)	28.0 (9.7)	.746	-0.324	-0.30
Mother-infant interactions: NCAST Teaching Scale							
	Caregiver total	47	36.0 (6.8)	36.8 (6.8)	.394	-0.853	-0.12
	Caregiver (contingency items) total	47	13.1 (3.8)	13.0 (4.2)	.897	-0.130	-0.02
	Infant total	47	15.2 (3.8)	15.7 (3.3)	.433	-0.784	-0.11
	Infant (contingency items) total	47	6.5 (2.5)	6.7 (2.2)	.779	-0.281	-0.04
	Caregiver/infant combined total	47	51.2 (9.4)	52.7 (7.3)	.211	-1.252	-0.18
	Caregiver/infant (contingency items) combined total	47	19.3 (5.3)	20.0 (5.1)	.535	-0.620	-0.09
			<i>N</i> (%)	<i>N</i> (%)			
Child social/emotional development: ASQ-SE2							
	Low or no risk		19 (59%)	22 (69%)			
	Monitor		7 (22%)	4 (12%)			
	Refer		6 (19%)	6 (19%)			

EPDS Edinburgh Postnatal Depression Scale, *BAI* Beck Anxiety Inventory, *BPD* borderline personality disorder, *BSL-23* Borderline Symptom List – 23, *MSI-BPD* McLean Screening Instrument for Borderline Personality Disorder, *DBT-WCCL* Dialectical Behavior Therapy Ways of Coping Checklist, *PSOC* Parenting Sense of Competence, *PRFQ* Parental Reflective Functioning, *PSI* Parenting Stress Index, *NCAST* Nursing Child Assessment Satellite Training, *ASQ-SE2* Ages & Stages Questionnaire Social-Emotional second edition

parental distress had reduced with findings indicating a moderate-large effect ($r = -0.43$); however, it is possible that statistical power was limited by the small sample ($n = 32$), with this measure being introduced later in the project.

Mother-infant interactions

There were no significant differences between pre- and post-group ratings of mother-infant interaction quality as measured by the NCAST, with effect sizes ranging

from negligible ($r = -0.02$) to small ($r = -0.18$) (see Table 2).

Child social-emotional development (ASQ-SE2)

Although scores on the ASQ-SE2 indicated there was a reduced need for early intervention services for infants, with three children moving from the monitor to low or no risk categories across the program, the proportion of children in each category (low or no risk, monitor, refer) was not significantly different.

Discussion

Continuation and expansion of the group program, MI-DBT, have continued to show consistent improvement for mothers with BPD across a wide range of measures, including quantitative measures of anxiety, depression, and BPD symptomatology. Women treated at childcare settings show improvements similar to those in women attending the HMH/MBU group program.

There are similar positive rates of change for parenting competence, parenting stress, and reflective capacity for both the community and HMH-based settings. Compared to our previous study however, (Sved Williams et al. 2018) when the Care Index showed an improvement in mother-infant relationships, the NCAST showed disappointing results in dyadic relationships. The NCAST is well validated for measurement of mother-infant relationships (Ransone et al. 2018) but we were unable to find the NCAST used as a measure of change over time in a similar population of women with borderline personality disorder. It is possible that differences in pre- and post-evaluation findings reflect developmental changes that impact observable behaviors and thus scoring at different ages, given the length of time between pre- and post-testing, rather than reflecting a shift in how the parent and infant interact and relate to each other. However, measures of the infant's own emotional and social development also differed little between pre- and post-assessment, suggesting that troubled dyadic relationships may require additional input.

Provision of the group at community-based children's centers enabled families to be linked in with community supports during the program and upon its completion, and families enjoyed the professional childcare workers' input. Clearly however, there are issues of increased cost compared to volunteer childcarers. Dunn et al. (2020) have recently described the difficulties of accessing relevant therapy for BPD sufferers, with access and cost often being insurmountable barriers. High attendance rates of 71% for MI-DBT may relate partly to no-cost therapy and provision of childcare. However, given the high attrition rates generally for BPD therapy groups (Storebø et al. 2020), it is likely that women value the groups for the skills they learn at this vital stage of their lives when motivation to be a better parent than the parenting they received themselves is high (Dunn et al. 2020).

Clearly, clinicians value the groups. Word-of-mouth communication from attenders of the early programs prompted high referral rates from a multitude of community-based clinicians for outpatient group support, leading to long waiting lists and then program expansion to different sites.

Community prevalence of BPD is substantial (Ellison et al. 2018); the effects of BPD on infants are increasingly

recognized and few programs exist for this population (Florange and Herpertz 2019) despite known infant effects (Eyden et al. 2016; Gratz et al. 2014). Historically, BPD has been little recognized and identified, with stigma perhaps interfering with open diagnosis and provision of treatment (Sheehan et al. 2016).

Limitations

There are currently no control or comparison groups for MI-DBT. Ethics approval has been granted to contact women on the waiting list, but return rates of self-report questionnaires were so low that a waiting-list comparison could not be made. The lives of many of the referred women are chaotic so despite clearly valuing the group once started, they often do not return pre- or post-group evaluation packs.

This study is a real-life clinical study, providing treatment for women with substantial emotional dysregulation and highly compromised relationships with their infant(s). Thus, while the admission criteria primarily requested a BPD diagnosis and the majority of women had this diagnosis, some women were accepted for group treatment who did not fully satisfy diagnostic criteria for this condition when referrers advocated on their behalf, knowing that their clinical state of emotional dysregulation was characteristic of that seen with BPD, and that no other relevant treatment programs were available. Some women had comorbid depression or anxiety and many had an array of previous psychiatric diagnoses. All group members knew that the group was run for women with BPD and all either agreed that this diagnosis was appropriate or accepted that this was the best "fit" diagnosis for their emotional turbulence. Some were also currently seeing other therapists, attending other groups and support services, and taking psychotropic medications which may have contributed to some of the improvements in mental health and infant measures found in our study. Additional funding was provided for the community groups to undertake individual therapy with participants as well as the group program, which was not available to the HMH-based group members. Comparisons of pre-post group are very similar in whichever setting MI-DBT is offered, i.e., there were similar results for those who had additional individual therapy compared to those who did not, suggesting that while other interventions and supports may have contributed to overall improvement, attendance at the group is likely to have been a major contributing factor. Qualitative interviews (unpublished) are also suggesting specific benefits of MI-DBT for the mother's mental health and mother-infant relationship. Most women are clear that

this program, including the benefits of a group with other mothers, is a unique and useful therapy.

Conclusions

Mothers referred during the continuation and expansion to community sites of MI-DBT clearly value the group with excellent retention rates, especially considering the nature of their mental health diagnoses and the many challenges they often face. It is noteworthy that so few groups are offered for these highly troubled perinatal BPD sufferers, despite increasing recognition of the importance of the first 1000 days. Women learn new skills to manage their emotional dysregulation, and their mood and anxiety symptoms improve as do parenting competence and reflective capacity. Further input such as additional individual mother-infant therapy may be needed to provide more change to the dyadic relationship to address specific challenges for each dyad, given the insignificant improvement in infant-parent interaction and the infant's social and emotional development in the current study. Impacting future generations is challenging. Comparison of outcomes for dyads receiving additional mother-infant therapy with outcomes from the current 11 groups could determine whether such intergenerational change can be achieved. Such studies are necessary to help convince funding bodies of the personal and financial benefits of intensive group programs such as MI-DBT, with the subsequent cost to the community of not intervening early.

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Author contribution All authors contributed to the study conception and design. Clinical material preparation was performed by Chris Yelland and Sharron Hollamby. Data collection and analysis were performed by Amanda Osborn. The first draft of the manuscript was written by Anne Sved Williams and Amanda Osborn and all the authors commented on previous versions of the manuscript. All the authors read and approved the final manuscript.

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Data availability Available on request.

Code availability Not applicable.

Declarations

Research involving human participants Study procedures were approved by the Women's and Children's Health Network Human Research Ethics Committee, approval number HREC/13/WCHN/111. In addition, the study was performed in accordance with the 1964 Helsinki Declaration.

Informed consent Informed consent was obtained from all individual participants included in the study including from children's legal guardians.

Conflict of interest The authors declare no competing interests.

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