

Doctoral Thesis

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Abstracts

Systematic Review of the Literature: *The relationship between the experience of childhood adversity and mental health outcomes for fathers in the perinatal period: a systematic review*

The experience of fathers has long been neglected in the field of perinatal mental health research. It is well-established that the experience of childhood adversity is predictive of maternal mental health difficulties. Recently, researchers have explored this relationship in relation to fatherhood. This paper systematically reviewed 13 studies examining the relationship between the experience of childhood adversity and paternal perinatal mental health outcomes. Associations were found between childhood adversity and a range of psychological outcomes in fathers in both the antenatal and postnatal periods. Several character traits – level of mindfulness and resilience – were shown to moderate the relationship, reducing the impact of childhood adversity on perinatal mental health outcomes. In addition, the ability to regulate emotions and maintain a stable sense of identity were reported as mediating variables. This paper also presents review findings relating to the quality of research in the field. Results are discussed critically in relation to wider literature and relevant theoretical frameworks, before research and clinical implications are presented.

Service Improvement Project: *Scoping and developing a brief psychology intervention for parents of children with chronic pain waiting to receive intensive rehabilitation*

Objective: How parents think about and respond to paediatric chronic pain can have a significant impact on their children's pain. This paper aimed to support the Oxford Centre for Children and Young People in Pain (OXCYPP) in its plan to introduce a brief intervention for parents of young people on the waiting list for intensive pain rehabilitation.

Methods: Qualitative data was gathered from parents of children who have recently received intensive pain rehabilitation from OXCYPP. Six parents were recruited to take part in semi-structured interviews. The data was analysed using thematic analysis.

Results: Three themes were drawn from the interviews. The first two (Learning and Adapting, Heard and Held) concerned the benefits parents described gaining from the intensive programme as regards new knowledge and skills and emotional support. The third (Overwhelmed and Underprepared) related to issues with communication and information sharing. Informed by these findings and the existing literature on comparable interventions, recommendations are made for establishing a brief parent intervention and improving other aspects of the service.

Conclusions: The service is encouraged to incorporate both professional and peer emotional support into the intervention, alongside pain education and management skills. It is also suggested that OXCYPP uses the waiting list intervention to improve communication with families to reduce uncertainty and increase patient engagement with the intensive rehabilitation programme. The importance of evaluating the effectiveness of the intervention through a full quality improvement cycle is emphasised.

Theory-Driven Research Project: *To what extent do mental defeat and somatic hypervigilance mediate the relationship between childhood maltreatment and chronic pain symptomology in adults with fibromyalgia?*

Adults with experience of childhood maltreatment are at higher risk of developing fibromyalgia (a form of chronic pain). The cognitive-behavioural transdiagnostic model for medically unexplained symptoms suggests that cognitive and behavioural factors play a role in maintaining conditions such as chronic pain. This study used a cross-sectional observational design to test two possible mediators in the relationship between childhood maltreatment and chronic pain severity: mental defeat and somatic hypervigilance. It also tested the role of mental defeat as a mediator between childhood maltreatment and three sub-domains of pain severity (intensity, distress, and disability). Mental defeat fully mediated between childhood maltreatment and pain severity, while somatic hypervigilance was not a significant mediator. Mental defeat also fully mediated the link between childhood maltreatment and pain distress, but not pain intensity or disability. These findings are situated in relation to existing research on childhood adversity and chronic pain, and research, clinical, and policy implications are discussed.

Systematic Review of the Literature

The relationship between the experience of childhood adversity and mental health outcomes for fathers in the perinatal period: a systematic review

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Abstract

The experience of fathers has long been neglected in the field of perinatal mental health research. It is well-established that the experience of childhood adversity is predictive of maternal mental health difficulties. Recently, researchers have explored this relationship in relation to fatherhood. This paper systematically reviewed 13 studies examining the relationship between the experience of childhood adversity and paternal perinatal mental health outcomes. Associations were found between childhood adversity and a range of psychological outcomes in fathers in both the antenatal and postnatal periods. Several character traits – level of mindfulness and resilience – were shown to moderate the relationship, reducing the impact of childhood adversity on perinatal mental health outcomes. In addition, the ability to regulate emotions and maintain a stable sense of identity were reported as mediating variables. This paper also presents review findings relating to the quality of research in the field. Results are discussed critically in relation to wider literature and relevant theoretical frameworks, before research and clinical implications are presented.

Introduction

Men are at risk of experiencing mental health difficulties during the transition to parenthood (Leiferman et al., 2021). Prevalence studies indicate that 5–10% of fathers experience perinatal depression and 5–15% experience perinatal anxiety (Leach et al., 2016; Paulson & Bazemore, 2010). Adapting to fatherhood can present a range of social and psychological challenges, including a shift in identity and changing roles within the family system (Wong et al., 2016). Several factors have been identified as key predictors of paternal distress in the perinatal period, including socioeconomic status, level of social support, relationship satisfaction, and maternal mental health difficulties (Anding et al., 2016; Carlberg et al., 2018; Chhabra et al., 2020; Goodman, 2008; Matthey et al., 2000; Thiel et al., 2020). As well as having serious consequences for fathers themselves, paternal perinatal mental health difficulties can contribute to poor maternal mental health outcomes (Philpott et al., 2019) and have an impact on children's emotional and cognitive development (Kowalenko et al., 2012; Paulson et al., 2009; Philpott, 2023; Ramchandani et al., 2008). However, because in the UK, as in many other countries, child-rearing has traditionally been viewed as a maternal role, the experience of fathers during the perinatal period is a neglected area of research (Darwin et al., 2021).

By contrast, there is a significant body of research concerned with the predictors and impacts of maternal mental health (Howard & Khalifeh, 2020; Kingston & Tough, 2014). According to the World Health Organisation, childhood adversity refers 'to some of the most frequently occurring sources of stress that children may suffer early in life' (2018). It encompasses, but is not limited to, experiences of child abuse and neglect. It also describes prolonged exposure to stressors such as violence between caregivers or within communities, parental substance abuse, and parental incarceration. There is robust evidence that a mother's experience of adversity in childhood is strongly predictive of perinatal psychological distress

(Christie et al., 2017; Moe et al., 2018; Racine et al., 2021). In addition, maternal mental health difficulties arising from childhood adversity have been shown to impact the development of the mother's children (Chang et al., 2021). On the basis of this research, we might reasonably surmise that similar effects also pertain to fathers who experience childhood adversity. However, it is not necessarily appropriate to generalise research findings relating to maternal mental health to the experience of fathers. Aside from the obvious biological and social differences (such as the fact that most fathers are non-gestational parents and are provided with only two-weeks of paid paternity leave in the UK), there is evidence to suggest that perinatal depression, for example, presents differently in women and men, with the latter demonstrating more externalising symptoms such as anger and risky behaviours (Mangialavori et al., 2021). To avoid making assumptions about generalisability, this study seeks to test whether childhood adversity, a known predictive variable of perinatal psychological distress in mothers, also has an impact on the perinatal mental health outcomes of fathers.

The impact of childhood adversity on perinatal mental illness can be conceptualised in a range of ways. The theory of latent vulnerability posits that the experience of childhood maltreatment leads to the atypical neuro-cognitive development of threat-processing, autobiographical memory, and reward systems (McCrory & Viding, 2015). This leads to what McCrory and Viding describe as 'stress weaknesses', which leave individuals vulnerable to experiencing psychopathology when exposed to stressors in the future. Within this framework, pregnancy and the first year postpartum can certainly be understood as times of high stress, sufficiently disruptive to reveal latent vulnerabilities. This theory is not dissimilar to Beck's cognitive model of emotional distress, which outlines the role of early childhood experiences in forming core beliefs about the self, the world, and the future (Beck et al., 1979). Children living in physically or emotionally unsafe homes can develop strong

negative core beliefs, which are then activated during periods of high stress (such as the transition to parenthood). Attachment theory, meanwhile, suggests that childhood adversity is associated with insecure and disorganised attachment styles which are activated in times of high stress, and, in turn, can affect parental relationships with the developing foetus and wider support systems (Fonagy & Bateman, 2016). Qualitative studies indicate that issues arising from insecure attachment styles in parents, such as difficulty trusting others and a low sense of self-worth, can impact perinatal wellbeing (Chamberlain et al., 2019).

To identify which theoretical frameworks best explain why experiences of childhood adversity increase the likelihood of perinatal mental health difficulties, we need to investigate underlying mechanisms and factors which increase or reduce the strength of the association. Research into maternal adverse childhood experiences (ACEs) and perinatal psychological distress has examined a number of mediating and moderating factors. Good social support has been identified as a variable which significantly reduces the risk of antenatal mental health difficulties in mothers with experience of childhood adversity (Racine et al., 2018; Walker, 2019). Several mediating factors have been established which provide some support for an attachment-based explanation of the association between childhood adversity and maternal mental health difficulties, including low relational resilience (defined as a sense of security, belonging and support in close relationships) (Howell et al., 2020), and adult attachment insecurity (Madsen et al., 2022).

As far as the author is aware, no previous systematic review has examined the relationship between the experience of childhood adversity and perinatal mental health difficulties in fathers. The paucity of research in this area has contributed to a clinical landscape with an absence of psychological interventions for fathers in the perinatal period (Rodrigues et al., 2021). The need for evidence-based interventions is becoming more urgent: recent NHS guidance outlines a plan to provide assessment and support for fathers within

perinatal mental health services (NHS England, 2019). Building on a growing body of recent reviews exploring correlates of paternal perinatal mental health problems (Ansari et al., 2021; Bilal et al., 2022; Chhabra et al., 2020; Director-General Health and Social Care: Scottish Government, 2024; Wang et al., 2021), the present paper aims to establish whether the experience of childhood adversity is associated with poorer perinatal mental health outcomes in fathers. As secondary objectives, it also appraises the evidence concerning: (a) whether specific types of childhood adversity are associated with particularly poor perinatal mental health outcomes in fathers; (b) whether particular perinatal mental health outcomes in fathers are associated with the experience of childhood adversity; and (c) what factors mediate or moderate the relationship between the experience of childhood adversity and paternal perinatal mental health outcomes.

Methods

Search Strategy

This study has been registered on PROSPERO (CRD42022366884). It was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Moher et al., 2009). Final searches were performed on 29 April 2024. Databases searched were Medline, Psychinfo, Embase, Scopus, and Cinahl. Searches were formed using related terms for four categories (childhood adversity, mental health outcomes, fathers, and perinatal period) and combined using Boolean operators (see Appendix 1.2 for full search strategy). Relevant subject headings were also added to the searches. Results were limited to English language/human studies only. To ensure that relevant papers were not missed, reference lists of relevant articles and related reviews were also searched.

Initial screening of titles and abstracts were performed by the lead author. Of these, 20% were screened by a second rater, achieving excellent agreement (Cohen's kappa = .89). Any disagreements were resolved through discussion between the two raters. Full texts of the

selected studies were then screened, with a second rater screening 20%. Total agreement was achieved (Cohen's kappa = 1.00).

Inclusion and exclusion criteria

Studies were included if they reported quantitative findings examining the association between the experience of childhood adversity and mental health outcomes of male parents in the perinatal period. Fatherhood is defined broadly here, to include resident or non-resident, cis or transgender fathers, as well as those from different- or same-sex parent dyads. The perinatal period is defined as from the onset of pregnancy until one year after birth. Childhood adversity is understood here to encompass, but not be limited to, experiences of child abuse and neglect. It also describes prolonged exposure to household stressors such as violence between caregivers or within communities, parental substance abuse, and parental incarceration.

Studies were excluded if they were not published in the English language, solely reported qualitative research, or took the form of existing reviews.

Quality assessment

As all papers included in the review were observational, study quality was assessed using the National Institutes of Health's Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies (2014). To compare quality across all studies included, each item was scored as either 0 (not met, not recorded, or not applicable) or 1 (met). Two questions from the original tool were left out, as they did not apply to this particular research question (see Appendix 3 for more information), leaving a possible range of scores from 0 to 12. The

creators of the tool prescribe that researchers set their own numerical cut-offs for qualitative descriptors, according to the items which are most salient to the research question. Through discussion with the second rater, it was decided that labels of 'good' would be assigned to studies scoring 9 or over, 'fair' to those scoring 6 to 8, and 'poor' to those scoring 5 or lower. The co-rater completed quality appraisal for 30% of studies (Cohen's kappa = .6), achieving moderate agreement.

Data extraction

Data was extracted by the lead author, with 50% completed by a second rater, reaching a good level of agreement. A data extraction sheet was used to obtain the following information from included studies:

(i) study aims;

(ii) study design;

(iii) location;

(iv) inclusion criteria for fathers;

(v) number of fathers in sample;

(vi) perinatal stage of fathers at recruitment (i.e. prenatal/postnatal, gestational age/age of infant);

(vii) aspect(s) of childhood adversity studied and how they were measured;

(viii) aspect(s) of perinatal mental health studied and how they were measured;

(ix) mediators and/or moderators included in the study and how they were measured;

(x) results of associations reported between (vii) and (viii); and

(xi) results of any mediation/moderation analyses conducted for the association between (vii) and (viii).

Data synthesis

Due to the small number of studies included in the review and their methodological heterogeneity (especially regarding constructs of childhood adversity and how they are measured), it was decided that a meta-analysis would not be appropriate. Instead, a narrative synthesis has been used to report the results. The first stage of synthesis involved completing textual descriptions of studies and tabulating the extracted data. Following this, the relationships within and between studies were explored in order to determine groupings.

Results

Study Characteristics

After full-text screening was completed, 13 studies were retained for inclusion in the review (see Figure 1 for PRISMA flowchart showing study selection process). The majority of studies used a cross-sectional design (*n* = 10), while some employed prospective methods (*n* = 3). The size of samples ranged from 51 to 2544 participants. Among studies that reported the value, mean ages of fathers ranged from 29.5 to 33.9. There was an equal balance of studies assessing paternal mental health in the antenatal period (*n* = 6) and postnatal period (*n* = 6). One study gathered both antenatal and postnatal outcomes. The majority of studies took place in Canada (Canada, *n* = 5; Japan, *n* = 2; China, *n* = 1; Finland, *n = 1*, Norway, *n = 1*, USA, *n = 1*, Germany, *n = 1*, Australia, *n = 1*).

Capturing fatherhood

Researchers differ in how they define fatherhood. They must decide, for example, whether their inclusion criteria includes fathers who are resident and non-resident, cis-gender and transgender, in different- and same-gender parent dyads, and are biologically related and unrelated to their child. Six of the included studies did not provide any information about the

types of fatherhood experiences included in their sample (Anding et al., 2016; Berthelot et al., 2020; Doi et al., 2022; Garon-Bissonnette et al., 2022; Mondolin et al., 2024; Skjothaug et al., 2015). In one study, fathers were classified as a cohabiting male identified by the mother (Dennis et al., 2022). Only one study specified that fathers had to be biologically related to their child (Quinlivan & Condon, 2005). Five papers indicated that men were enrolled in the study alongside a female co-parent, which suggests that they were likely recruited as part of a different-gender parent dyad. Of these, one stated that the fathers recruited did not need to be in a sustained romantic relationship or living with the mother to meet inclusion (Dayton et al., 2019). The remaining four papers required fathers to be in a relationship or cohabiting with the mother (Godbout et al., 2023; Liu et al., 2019; Obikane et al., 2023; Rassart et al., 2022).

Figure 1.

Flowchart of search and screening process following PRISMA guidelines.

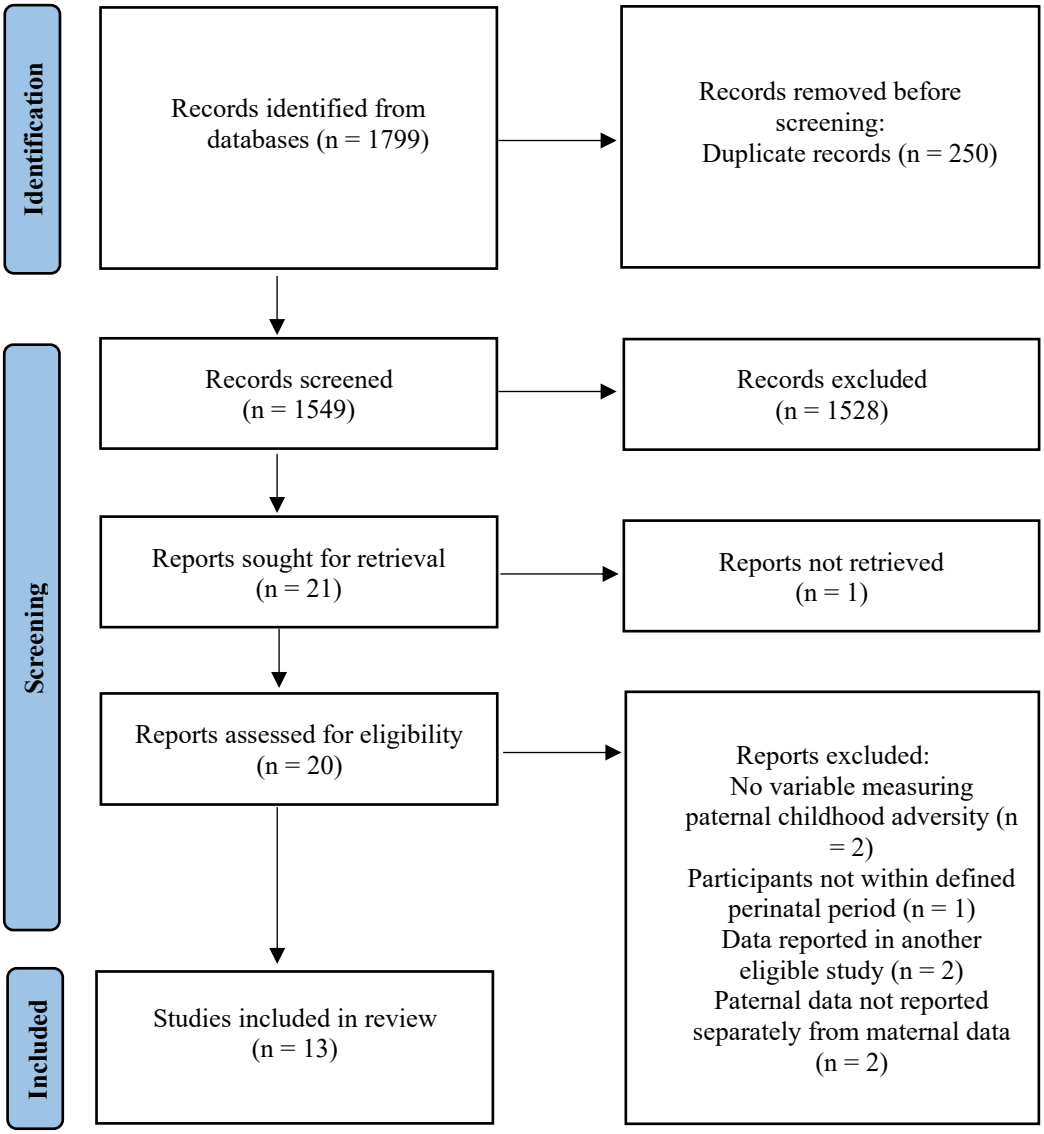

Table 1.

Summary of key study characteristics

Authors (year)	*N* (fathers)	Age (*M*, *SD*, range if reported)	Study design	Sample (antenatal or postnatal)	Country
Anding et al. (2016)	276	32.18 (6.21)	Correlational	*Postnatal* 2 weeks postpartum	Germany
Berthelot et al. (2020)	71	29.54 (3.99)	Correlational	*Antenatal* 3rd trimester	Canada
Dayton et al. (2019)	51	18-25: 45.1% 26-30: 19.6% 31-40: 31.3% 40-59: 4%	Correlational	*Antenatal* Mean gestational age (weeks) = 32.29 (*SD* = 3.85)	USA
Dennis et al. (2022)	2544	33.9 (4.88)	Prospective (but only cross-sectional data met inclusion criteria)	*Postnatal* 1 year postpartum	Canada
Doi et al. (2022)	At T1: 548 At T2: 398	None reported	Prospective	*Postnatal* T1 = 1 week postpartum T2 = 3 months postpartum	Japan
Garon-Bissonnette et al. (2022)	561	30.84 (5.41) Range: 20 to 55	Correlational	*Antenatal* (unspecified gestational age)	Canada
Godbout et al (2023)	843	32.6 (5.8) Range: 20 to 57	Correlational	*Postnatal* Up to 1 year postpartum	Canada

Liu et al. (2019)	156	33.31 (4.58)	Correlational	*Postnatal* 6 months postpartum	China
Mondolin et al. (2024)	1934	32.1 (5.3) Range: 17 to 60	Correlational	*Antenatal* Gestational weeks 14, 24 and 34 (mean scores of all three timepoints used as dependent variable)	Finland
Obikane et al. (2023)	1719	Range: 15 to 69	Correlational	*Antenatal* (*n* = 473) (unspecified gestational age) And *postnatal* (*n* = 1246) Up to 1 year postpartum	Japan
Quinlivan et al (2005)	100	Teenage group mean = 20.7 Older group mean = 29.6	Correlational	*Antenatal* Mean gestational age (weeks) = 22 (*SD* = 3.5)	Australia
Rassart et al. (2022)	421	33.75 (5.6)	Correlational	*Postnatal* Mean infant age (months) = 2.68 (*SD* = 1.78)	Canada
Skjothaug et al. (2015)	569	32.3 (5.9) Range: 16 to 56	Prospective	*Antenatal* Between gestational weeks 8 to 36. T1: 8–34 T2: 20–25 T3: 26–31 T4: 32–34 T5: 36	Norway

Risk of bias

No studies were excluded on the basis of their risk of bias assessment. However, a range of quality levels were identified in the included studies, which is important to consider when interpreting the results. See Table 2 for detailed scores for each study using the quality appraisal tool. Out of a total of 12 points, study scores ranged from 5 to 8. Most papers lost marks pertaining to strength of study design due to employing correlational, cross-sectional methods, which provide weaker results regarding causation in the relationship between exposure and outcome. Quality points were also deducted from each study as none reported justifications of their chosen sample size or discussed statistical power. The quality appraisal tool, however, did not capture certain relevant study features which increase risk of bias. These additional aspects of study quality are thus noted qualitatively here. For example, the tool has no criteria concerning actual sample size. While some studies included large sample sizes (particularly Dennis et al., 2022, n = 2544; Mondolin et al., 2024, n = 1934; Obikane et al., 2023, n = 1719), making it more likely that they are sufficiently powered, others report much smaller samples (Berthelot et al., 2020, n = 71; Dayton et al., 2019, n = 51), increasing the chance of false negative results. In addition, the formal risk of bias assessment did not incorporate the fact that some studies provided more detail than others on sample characteristics in relation to the experience of fatherhood (as noted above).

Measures of childhood adversity

A range of self-report measures were used to assess many different aspects of childhood adversity. The most commonly used measure was the Childhood Trauma Questionnaire (CTQ) (Berthelot et al., 2020; Dayton et al., 2019; Garon-Bissonnette et al., 2022; Liu et al., 2019), which gathers data on five categories of childhood adversity: emotional abuse, physical abuse, sexual abuse, emotional neglect, and physical neglect. The Cumulative

Childhood Trauma Questionnaire (CCTQ), which measures exposure to five domains of abuse and neglect, was developed in Canada and used in two of the reviewed studies (Godbout et al., 2023; Rassart et al., 2022). One study used the Trauma and Distress Scale (TADS), which also gathers scores on five domains of child abuse and neglect (Mondolin et al., 2024). Two studies assessed childhood adversity by posing single yes/no questions: one asked about the experience of physiological or psychological violence in childhood (Anding et al., 2016), while the other focused on exposure to domestic abuse under the age of 5 (Quinlivan & Condon, 2005).

Several studies used an Adverse Childhood Experience (ACE) questionnaire. Many versions of the ACE tool are in common use, with different numbers of items and comprising different adverse experiences. One study employed the ACE-International Questionnaire (ACE-IQ), a 29-item version which measures both range (how many different types of adversity are experienced) and frequency (how often were the forms of adversity experienced) of exposure (Dennis et al., 2022). Another used a Japanese 8-item version of the ACE questionnaire, which, like most ACE tools, does not assess frequency of exposure (Doi et al., 2022). The two remaining studies did not specify which version of the ACE was used and, as such, it is not possible to know how many or which items appeared in the measure (Obikane et al., 2023; Skjothaug et al., 2015).

Measures of perinatal mental health

The reviewed studies explored a range of different perinatal psychological constructs in relationship to paternal childhood adversity (see Table 3). These included depression, anxiety, stress, personality disorder, post-traumatic stress disorder, dissociative symptoms and intense feelings of anger. All of the measures were self-report questionnaires. Most studies measuring depression as a outcome variable used the Edinburgh Postnatal Depression

Scale (EPDS) and its translated variants (Anding et al., 2016; Berthelot et al., 2020; Dayton et al., 2019; Dennis et al., 2022; Doi et al., 2022; Godbout et al., 2023; Mondolin et al., 2024; Obikane et al., 2023; Skjothaug et al., 2015). Three studies reported combined measures which produce scores on two dimensions of depression and anxiety. These were the Chinese version of the Depression Anxiety Stress Scale (Liu et al., 2019), the Hospital Anxiety and Depression Scale (Quinlivan & Condon, 2005), and the French version of the Kessler Psychological Distress Scale (Garon-Bissonnette et al., 2022).

To capture generalised anxiety symptoms, several studies used the State-Trait Anxiety Inventory (STAI) (Dayton et al., 2019; Dennis et al., 2022; Doi et al., 2022), while one used the Symptom Checklist 90 (Mondolin et al., 2024). One study used the Pregnancy-Related Anxiety Questionnaire – Revised to capture anxiety relating to the pregnancy and birth (Skjothaug et al., 2015). Two papers examined parental stress as an outcome, using the Parental Stress Scale (Rassart et al., 2022) and the German Parent Stress Questionnaire (Anding et al., 2016).

The three studies measuring post-traumatic stress symptoms used either the French version of the PTSD checklist for DSM V (Berthelot et al., 2020; Garon-Bissonnette et al., 2022) or Posttraumatic Symptom Disorder Checklist – Civilian (Dayton et al., 2019). Personality disorder and personality impairment were assessed in two studies, using respectively the French version of the Personality Diagnostic Questionnaire (Berthelot et al., 2020) and the Self and Interpersonal Functioning Scale (Garon-Bissonnette et al., 2022). One of these papers also measured dissociative symptoms using the French version of the Dissociative Experiences Scale (Berthelot et al., 2020). One study measured intensity of angry feelings using the State Anger scale from the State-Trait Anger Expression Inventory-2 (Garon-Bissonnette et al., 2022).

Table 2.

Summary of risk of bias assessment

Authors (year)	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	Score (range 0 to 12) and rating
Anding et al. (2016)	Yes	Yes	NR	Yes	No	No	No	No	No	Yes	N/A	No	4. Poor
Berthelot et al. (2020)	Yes	Yes	No	Yes	No	No	No	No	Yes	Yes	N/A	Yes	6. Fair
Dayton et al. (2019)	Yes	Yes	NR	Yes	No	No	No	Yes	Yes	Yes	N/A	No	6. Fair
Dennis et al. (2022)	Yes	Yes	NR	Yes	No	No	No	Yes	Yes	Yes	N/A	Yes	7. Fair
Doi et al. (2022)	Yes	Yes	Yes	Yes	No	No	No	Yes	No	Yes	Yes	Yes	8. Fair
Garon-Bissonnette et al. (2022)	Yes	Yes	NR	Yes	No	No	No	Yes	Yes	Yes	N/A	Yes	7. Fair
Godbout et al. (2023)	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	N/A	Yes	8. Fair

Liu et al. (2019)	Yes	Yes	NR	Yes	No	No	No	Yes	Yes	Yes	N/A	No	5. Poor
Mondolin et al. (2024)	Yes	Yes	NR	Yes	No	No	No	Yes	Yes	Yes	NR	Yes	7. Fair
Obikane et al. (2023)	Yes	Yes	Yes	Yes	No	No	No	No	No	Yes	N/A	Yes	6. Fair
Quinlivan et al. (2005)	Yes	Yes	Yes	Yes	No	No	No	No	No	Yes	N/A	Yes	6. Fair
Rassart et al. (2022)	Yes	Yes	NR	Yes	No	No	No	Yes	Yes	Yes	N/A	Yes	7. Fair
Skjothaug et al. (2015)	Yes	Yes	NR	Yes	No	Yes	Yes	Yes	No	Yes	No	Yes	8. Fair

Note. 1. Was the research question or objective in this paper clearly stated?; 2. Was the study population clearly specified and defined?; 3. Was the participation rate of eligible persons at least 50%?; 4. Were all the subjects selected or recruited from the same or similar populations (including the same time period)? Were inclusion and exclusion criteria for being in the study prespecified and applied uniformly to all participants?; 5. Was a sample size justification, power description, or variance and effect estimates provided?; 6. For the analyses in this paper, were the exposure(s) of interest measured prior to the outcome(s) being measured?; 7. Was the timeframe sufficient so that one could reasonably expect to see an association between exposure and outcome if it existed?; 8. For exposures that can vary in amount or level, did the study examine different levels of the exposure as related to the outcome (e.g., categories of exposure, or exposure measured as continuous variable)?; 9. Were the exposure measures (independent variables) clearly defined, valid, reliable, and implemented consistently across all study participants?; 10. Were the outcome measures (dependent variables) clearly defined, valid, reliable, and implemented consistently across all study participants; 11. Was loss to follow-up after baseline 20% or less?; 12. Were key potential confounding variables measured and adjusted statistically for their impact on the relationship between exposure(s) and outcome(s)?

The following questions from the original tool were not included. '(a) Was the exposure(s) assessed more than once over time?' This was omitted because it is designed to measure exposures which have the potential to change over the course of the study. While repeating retrospective measures of childhood adversity several times over the course of a study may help show how reliable a respondent's answers are, this is not common practice as the exposure will not change; '(b) Were the outcome assessors blinded to the exposure status of participants?.' As all of the studies used questionnaires to gather data, it was not felt that blinding or unblinding researchers would significantly effect the quality of the studies.

Table 3.

Summary of study constructs and measures

Authors (year)	Childhood maltreatment measure	Perinatal psychological distress construct(s)	Perinatal psychological distress measure(s)	Mediation variable(s) and measure(s)	Moderation variable(s) and measure(s)
Anding et al. (2016)	Single item: 'Have you experienced physiological or psychological violence in your childhood?' (yes/no)	1) Depression 2) Parental stress	1) EPDS (de) 2) ESF	N/A	N/A
Berthelot et al. (2020)	CTQ (fr)	1) Depression 2) Personality disorder 3) Dissociative symptoms 4) PTSD	1) EPDS (fr) 2) PDQ-4 (fr) 3) DES-II (fr) 4) PCL-5 (fr)	N/A	N/A
Dayton et al. (2019)	CTQ	1) Depression 2) Anxiety 3) PTSD	1) EPDS 2) STAI 3) PCL-C	N/A	N/A
Dennis et al. (2022)	ACE-IQ	1) Depression 2) Anxiety	1) EPDS 2) STAI	N/A	N/A
Doi et al. (2022)	Eight-item ACE questionnaire	1) Depression 2) Anxiety	1) EPDS 2) STAI	N/A	N/A
Garon-Bissonnette et al. (2022)	CTQ (fr)	1) PTSD 2) Anxiety and depression 3) Angry feelings 4) Personality impairment	1) PCL-5 (fr) 2) K10 (fr) 3) State Anger scale of STAXI-2 (fr) 4) SIFS	N/A	N/A
Godbout et al. (2023)	CCTQ	Depression	EPDS	N/A	Dispositional mindfulness*:* FFMQ
Liu et al. (2019)	CTQ (ch) – emotional abuse and emotional neglect subscale	Psychological distress	DASS (ch)	N/A	N/A

Mondolin et al. (2024)	TADS	1) Depression 2) Generalised anxiety	1) EPDS 2) SCL-90	N/A	Trait resilience: CD-RISC-10
Obikane et al. (2023)	Paternal ACEs (unreferenced and unspecified items)	Depression	EPDS	N/A	N/A
Quinlivan et al. (2005)	Single item: 'were you exposed to domestic abuse under 5 years of age? (yes/no)	Anxiety and depression	HADS	N/A	N/A
Rassart et al. (2022)	CCTQ	Parenting stress	PSS	Affect regulation, identity cohesion, relatedness: IASC	N/A
Skjothaug et al. (2015)	ACE questionnaire (unreferenced, specified 10-items)	1) Perinatal depression 2) Pregnancy-related anxiety	1) EPDS (no) 2) PRAQ-R	N/A	N/A

Note: ACE = Adverse Childhood Experiences Scale (Anda et al., 2010); ACE-IQ = Adverse Childhood Experiences International Questionnaire (World Health Organization, 2018); CCTQ = Childhood Cumulative Trauma Questionnaire (Godbout et al., 2017); CD-RISC-10 = Connor Davidson Resilience Scale 10 (Connor & Davidson, 2003); CTQ = Childhood Trauma Questionnaire (Bernstein et al., 1998); CTQ(ch) = Chinese CTQ (Bai & Han, 2016); CTQ (fr) = French CTQ (Lacharité et al., 2002); DASS (ch) = Chinese Depression Anxiety Stress Scale (K. Wang et al., 2016); DES-II = French version of Dissociative Experiences Scale (Larøi et al., 2013); EPDS = Edinburgh Postnatal Depression Scale (Cox et al., 1987); EPDS (de) = German EPDS (Bergant et al., 2008); EPDS (fr) = French EPDS (Adouard et al., 2005); EPDS (no) = Norwegian EPDS (Eberhard-Gran & Slinning, 2007); ESF = Elternstressfrageboten (German Parent Stress Questionnaire) (Domsch & Lohaus, 2010); FFMQ = Five Facet Mindfulness Questionnaire (Baer et al., 2006); HADS = Hospital Anxiety and Depression Scale (Zigmond & Snaith, 1983); IASC = Inventory of Altered Self Capacities (Briere & Runtz, 2002); K10 (fr) = French Kessler Psychological Distress Scale (Gravel et al., 2003); PCL-5 (fr) = French PTSD Checklist for DSM V (Ashbaugh et al., 2016); PCL-C = Posttraumatic Symptom Disorder Checklist – Civilian (Weathers et al., 1993); PDQ-4 (fr) = French Personality Diagnostic Questionnaire for DSM IV (Bouvard, 2009); PRAQ-R = Pregnancy-Related Anxiety Questionnaire – Revised (Huizink et al., 2004); PSS = Parental Stress Scale (Berry & Jones, 1995); SCL-90 = Symptom Checklist 90 (Derogatis & Cleary, 1977); SIFS = Self and Interpersonal Functioning Scale (Gamache et al., 2019); STAI = State-Trait Anxiety Inventory (Spielberger, 1983); STAXI-2 = State-Trait Anger Expression Inventory-2 (Spielberger, 2010); TADS = Trauma and Distress Scale (Salokangas et al., 2016)

Childhood adversity and antenatal mental health outcomes in fathers

The reviewed studies suggest that experiences of childhood adversity are related to mental health outcomes in fathers during the antenatal period. One study found moderate-strength positive correlation between childhood maltreatment experiences and distress symptoms in fathers at gestational week 14 (the second trimester of pregnancy) (Mondolin et al., 2024). Another identified a significant association between childhood trauma as a continuous variable and psychiatric symptoms in expecting fathers, demonstrating a dose-response effect (Garon-Bissonnette et al., 2022). These findings are supported by a study which measured mental health outcomes in expecting fathers across five antenatal timepoints (Skjothaug et al., 2015). A significant association between childhood adversity and symptoms of pregnancy-related depression and anxiety was found at almost all stages in pregnancy, with the exception of a non-significant association between ACE scores and pregnancy-related anxiety at gestational week 36.

Several studies reported on specific types of childhood adversity as predictor variables, including one which found that a history of childhood neglect – but not abuse – was significantly correlated with psychological distress in antenatal fathers (Dayton et al., 2019). However, it is important to interpret the non-significant finding in this study with caution. In the absence of a discussion of statistical power in the paper, and with a small sample size of $n = 51$, it is possible that this result could be a false negative. Quinlivan and Condon's (2005) study examined the effect of being exposed to domestic violence under the age of 5, and found it was a factor which increased a father's chance of experiencing anxiety and depression during the second trimester ($M = 22$ gestational weeks, $SD = 3.5$).

Berthelot et al. (2020) reported findings concerning the impact of childhood adversity on a range of psychological outcomes in the antenatal period. They found that fathers with experience of childhood adversity were more likely to report higher symptom levels for

PTSD, dissociation, and personality difficulties. However, no difference was found in symptoms of paternal depression between fathers with and without experience of adversity. This is seemingly contradicted by Obikane et al. (2023), who described significant associations between paternal ACEs and symptoms of antenatal depression. Both studies received 'fair' quality ratings, meaning this discrepancy can't necessarily be resolved by considering risk of bias. However, it could possibly be explained by other factors, including the gestational timepoint at which researchers assessed depression. Skjothaug et al. (2015) suggest that associations between ACEs and depression are strongest early in the pregnancy, with effects reducing to the lowest point at 36 gestational weeks. Berthelot et al. (2020) measured paternal depressive symptoms in the third trimester of pregnancy, at the point when Skjothaug et al. (2015) suggest the association is at its weakest. Obikane et al. (2023), however, gathered data at all timepoints in pregnancy, likely including expecting fathers both at early and late gestational dates. Moreover, differences in sample size (Berthelot et al., 2020, $n = 71$; Obikane et al., 2023, $n = 1719$) could explain the discrepancy in results.

Childhood adversity and postnatal mental health outcomes in fathers

The majority of reviewed studies indicated that postnatal psychological distress is correlated with the experience of childhood adversity. Godbout et al. (2023) reported a significant association between childhood interpersonal trauma and paternal postnatal depressive symptoms, while Obikane et al. (2023) found that the experience of ≥4 ACEs predicts postnatal depression. Parenting stress in fathers is shown by Rassart et al. (2022) to be related to the experience of cumulative childhood trauma.

One study examined the impact of six or more ACEs (a higher cutoff than typically used) on the comorbid presentation of depression and anxiety in postnatal fathers, finding a significant predictive relationship (Dennis et al., 2022). Another paper (Doi et al., 2022)

assessed the relationship between ACEs and symptoms of anxiety and depression over two postnatal timepoints: 1 week and 3 months after delivery. The association between ACEs and anxiety was significant at both timepoints, while the link between ACEs and depression was significant only at the 1-week stage. Doi et al. (2022) hypothesise that this may be because in Japan, where the study took place, fathers rarely take paternity leave from work. As such, by 3 months post-delivery, most fathers have relinquished child-rearing duties and returned to their workplace where they can connect with social support.

Two studies assessed more specific experiences of childhood adversity as predictor variables. Liu et al. (2019) focused on emotional maltreatment, measured using the emotional abuse and emotional neglect subscales from the CTQ. They reported that childhood emotional maltreatment was significantly associated with postnatal psychological distress (a construct comprising aspects of depression, anxiety and stress). Another study explored whether childhood violence is a predictor of mental health outcomes in the postnatal period (Anding et al., 2016). They found that while depression scores in fathers were significantly predicted by a history of childhood violence in a univariate regression model, in a multivariate model that included parental stress, relationship satisfaction, mother's EPDS score, and pregnancy- and birth-related distress, the association ceased to be significant. However, both of these papers received a quality rating of 'poor', meaning the results should be interpreted with caution.

The only paper to compare antenatal and postnatal psychological outcomes in fathers in relation to childhood adversity reported that the antenatal depression had a stronger association with ACEs than postnatal depression (Doi et al., 2022). This study received a relatively high quality rating among the reviewed studies, indicating a low risk of bias.

Moderators and mediators between childhood adversity and paternal perinatal mental health outcomes

Two studies test the moderating potential of stable characteristics and traits which are posited to influence the strength of association between childhood adversity and paternal perinatal mental health. Godbout et al. (2023) focus on the trait of 'dispositional mindfulness', which is suggested to comprise five facets: observation, description, non-judgment, non-reactivity, and acting with awareness. They found that participants' overall level of mindfulness was a significant moderator in the relationship between childhood interpersonal trauma and postnatal depression, reducing the strength of the association. Acting with awareness was also a moderator, while observation, description, non-judgement and non-reactivity were not. Another study explored the trait of resilience – defined as the 'self-perceived capacity to cope with stressors' – and found it significantly moderated the relationship between experiences of childhood maltreatment and antenatal psychological distress (Mondolin et al., 2024).

This review identified only one study which examined a mediation-path in the relationship between childhood adversity and paternal perinatal mental health outcomes (Rassart et al., 2022). An attachment framework was used to propose that childhood trauma interferes with a child's ability to develop self-capacities, which support 'an individual's ability to maintain a sense of personal identity and self-awareness across various experiences'. Three aspects of self-capacity were assessed as potential mediators: affect dysregulation, interpersonal conflict (not being able to maintain meaningful relationships), and identity impairment (not being able to maintain a sense of personal identity). While significant indirect effects were reported for the pathway between the experience of childhood interpersonal trauma and paternal parenting stress via the variables of affect dysregulation and identity impairment, interpersonal conflict was found to be a non-significant mediator.

Discussion

This paper is the first systematic review of studies which report on the relationship between childhood adversity and perinatal mental health outcomes in fathers. Broadly, the findings suggest that experiencing adversity in childhood does increase the likelihood of men experiencing perinatal mental health difficulties, in both the antenatal and postnatal periods. This association is in line with the more robust body of evidence relating to maternal ACEs and mental health, and may suggest that the experiences of mothers and fathers have some core shared features. The only study reviewed here which gathered data on both paternal antenatal and postnatal mental health outcomes found that childhood adversity most strongly predicted psychological distress in the prenatal period (Doi et al., 2022). This is consistent with previous research indicating men are at higher risk of experiencing mental health difficulties in the antenatal period than after birth (Condon et al., 2004).

The majority of studies reviewed focused on perinatal anxiety and depression as outcome variables. Consequently, there appears to be a stronger evidence base for the predictive value of childhood adversity on perinatal anxiety and depression. However, a few studies did identify a relationship between childhood adversity and other psychological outcomes, including post-traumatic stress, dissociative, and personality disorder symptoms. The small number of studies included in the review and the heterogeneity of their predictor and outcome variables makes it difficult to compare strength of effects across different perinatal mental health difficulties. Partly for the same reasons, it has not been possible in this review to draw strong conclusions around the differential impacts of different types of adverse experience. Although some studies did use more comprehensive maltreatment measures (such as the CTQ or CCTQ), they mostly did not analyse or report results using subscale scores. A few studies exclusively measured specific types of childhood maltreatment such as childhood violence or emotional maltreatment. A great deal of caution

must be exercised when using results from such studies to determine the impact of maltreatment subtypes. The extensive degree of shared variance across maltreatment types means that empirical studies which do not account for multiple forms of exposure are at risk of overstating the effect of single categories or sub-types of maltreatment (Cecil et al., 2017).

This review also sheds light on the uneven state and underlying assumptions of existing research into perinatal mental health difficulties and their relationship with childhood adversity. The fact that as few as 13 studies were identified as meeting inclusion criteria suggests that there is still a long way to go before the mental health of fathers is considered to be on an equal research footing with the mental health of mothers. All of the studies reviewed scored either 'fair' or 'poor' on the quality appraisal tool. Most of them relied on one-off cross-sectional questionnaires, and none of them justified their sample sizes with reference to statistical power. Another problematic feature present across the studies reviewed here was a reliance on a battery of psychological outcome measures developed for mothers. Using these measures on fathers compromises the validity of the findings. There is evidence to suggest, for example, that the Edinburgh Postnatal Depression Scale (used by almost all studies in this review) is less sensitive to depression in fathers than in mothers, and, as such, different cutoffs should be used for men (Shafian et al., 2022).

On a more hopeful note, all but one of the included studies was published since 2015. This points towards a cultural step-change in the last ten years in the significance attributed to paternal perinatal experiences. However, this shift does not yet seem to have led researchers in this field to define fatherhood in more precise and reflexive ways. Most studies either did not report a definition of fatherhood or recruited men from different-gender parent dyads, indicating that the category is still widely understood through a cis-heteronormative lens. The lack of justification for how fatherhood was defined is also problematic because parenting roles differ greatly within and between societies (Lansford, 2022; Seward & Stanley-Stevens,

2014). Combined with a broader absence of discussion of how fathers perceive their role and the extent of their involvement in family life, the studies' uncritical approach to defining fatherhood makes it difficult to draw conclusions about how cultural and social differences may have impacted the results reported in different countries.

This review has also synthesised findings relating to moderating and mediating factors in the relationship between childhood adversity and paternal perinatal mental health. Two individual character traits were identified as moderating factors: mindfulness and resilience. While the studies which identified these findings focused on stable character traits, they do not discuss in any detail the impact of childhood adversity on the development of enduring aspects of personality, and it is thus unclear to what extent we can consider these moderators to be independent factors (Allen & Lauterbach, 2007; Sudbrack et al., 2015). Two mediators were also found: affect dysregulation and identity impairment. Given that the capacity to regulate emotions and maintain a stable sense of identity seem to be developed through positive attachment experiences (Briere & Runtz, 2002), the identification of these mediators provides some support for an attachment theory framing of childhood adversity's impact on adult mental health outcomes (Fonagy & Target, 1997). All of the constructs assessed by the reviewed studies as potential moderators and mediators were internal psychological factors. Similar research looking at mothers has identified a range of social and economic variables which influence the pathway between childhood adversity and maternal mental health difficulties, including quality of parenting relationship, financial resources, and housing stability (Mersky & Janczewski, 2018; Wood et al., 2023). In the paternal perinatal mental health literature, there is a notable absence of studies looking beyond internal psychological factors.

Strengths and limitations

This review was designed to capture as wide a breadth of studies as possible, and thus provide a comprehensive survey of a relatively young field of research. It considered a wide range of forms of childhood adversity alongside more specific types of maltreatment, and the widest possible definition of fatherhood was used. Search terms were designed to be as inclusive as possible, and explored subject headings were used in searches. Although studies not written in English were excluded, the review included studies undertaken in eight countries, across four continents. Because parenting roles and experiences are deeply culturally contingent, it is imperative to consult research from as wide a range of societies and cultures as possible before attempting to draw more general conclusions. However, all of the included studies were conducted in high-income countries (The Organization for Economic Cooperation and Development, 2023). Itself a product of larger global inequities, this limitation is indicative of the long-standing scarcity of mental health research conducted in low- and middle-income countries (Razzouk et al., 2010). However, it is possible that the decision to exclude papers published in languages other than English has had an impact on the diversity of studies included.

This paper has a number of other limitations. The fact that only 13 papers met the inclusion criteria presents challenges when it comes to identifying clear patterns and trends. The heterogeneity of results also meant that a meta-analysis, which would have allowed for stronger statistical claims to be made about observed effects, could not be conducted. In addition, because most of the studies employed a cross-sectional design, it has not been possible to draw conclusions around causation in the relationship between childhood adversity and perinatal mental health in fathers. As a result, this paper has focused both on outlining the range of results within the included papers and commenting on the observed state of the field.

Implications

This review suggests a range of directions for future research. First and foremost, it underscores the need for more empirical studies which explore the association between childhood adversity and paternal perinatal mental health outcomes, especially prospective cohort research which can make stronger claims about causality. Future studies should gather data on a broad range of childhood adversity exposures and report results for all subtypes. Accounting for the considerable shared variance between subtypes of childhood adversity would allow stronger conclusions to be drawn about their relative impact. It would also be valuable for future research to measure psychological outcomes at multiple perinatal timepoints and always report the precise gestational age/postpartum weeks at data collection, to enable a more detailed understanding of the specific risk points for fathers with experience of childhood adversity.

More robust and precise findings could be achieved by addressing more explicitly the broad range of fatherhood experiences and the complexities of defining fathers as a group. Going forward, researchers should always specify their recruitment criteria for fathers. They should also actively seek to recruit under-represented fathers, particularly those who are transgender and/or in non-heteronormative parenting partnerships. Moreover, to address a key methodological issue in the reviewed papers, studies should either develop or use specific measures of paternal perinatal psychological distress – such as the Perinatal Assessment of Paternal Affectivity (Baldoni et al., 2016) or DDads Questionnaire (Vermeulen et al., 2021) – or dedicate more research resource to validating tools originally designed to detect perinatal mental health difficulties in mothers.

There are a range of implications for clinical practice resulting from this review. Qualitative research has found that many fathers are still not routinely asked about their mental health in contacts with midwives and health visitors in the perinatal period (Baldwin et al., 2021). This reviews adds to the body of literature calling for a wider cultural shift in which perinatal services are considered to be available to both mothers and fathers alike (Burgess & Goldman, 2018). Increasingly, perinatal services are being encouraged to adopt a trauma-informed approach to care, which involves training and supporting staff to recognise the impact of trauma and to deliver care in a way which promotes feelings of safety and resists retraumatisation (Centre for Early Childhood Development, 2021). This shift is partly due to the recognition that many birthing women will have experienced childhood trauma, the effects of which can be heightened when receiving perinatal care (Montgomery, 2013). Because fathers with experience of childhood adversity are also at risk of perinatal distress, they are also likely benefit from a trauma-informed approach in the antenatal and postnatal period, as well as during the birth.

A finding that adverse childhood experiences lead to an increased likelihood, at the population level, of mental health difficulties does not mean that any given individual will necessarily face such difficulties or that these outcomes cannot be prevented. As well as giving evidence of a link between childhood adversity and perinatal mental health difficulties in fathers, this review provides early indications of what kinds of clinical interventions might be developed to try to reduce or interrupt the association. One possible route forward would be to target therapeutically the variables identified as moderators (level of mindfulness and sense of personal resilience) and mediators (ability to regulate emotions and maintain a sense of identity). However, any such intervention should be evaluated through robust experimental research before being implemented clinically.

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Service Improvement Project

Scoping and developing a brief psychology intervention for parents of children with chronic pain waiting to receive intensive rehabilitation

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Internal Supervisor: Dr Fiona McFarlane

External Supervisor: Dr Emma Dunford

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Abstract

Objective: How parents think about and respond to paediatric chronic pain can have a significant impact on their children's pain. This paper aims to support the Oxford Centre for Children and Young People in Pain (OXCYPP) in its plan to introduce a brief intervention for parents of young people on the waiting list for intensive pain rehabilitation.

Methods: Qualitative data was gathered from parents of children who have recently received intensive pain rehabilitation from OXCYPP. Six parents were recruited to take part in semi-structured interviews. The data was analysed using thematic analysis.

Results: Three themes were drawn from the interviews. The first two (Learning and Adapting, Heard and Held) concerned the benefits parents described gaining from the intensive programme as regards new knowledge and skills and emotional support. The third (Overwhelmed and Underprepared) related to issues with communication and information sharing. Informed by these findings and the existing literature on comparable interventions, recommendations are made for establishing a brief parent intervention and improving other aspects of the service.

Conclusions: The service is encouraged to incorporate both professional and peer emotional support into the intervention, alongside pain education and management skills. It is also suggested that OXCYPP uses the waiting list intervention to improve communication with families to reduce uncertainty and increase patient engagement with the intensive rehabilitation programme. The importance of evaluating the effectiveness of the intervention through a full quality improvement cycle is emphasised.

Introduction

Chronic pain affects many children. The most recent systematic review of epidemiological studies estimates prevalence rates of between 15–30% (King et al., 2011). In the UK, paediatric chronic pain services are typically organised around the provision of out-patient and intensive interdisciplinary rehabilitation treatment (NHS England, 2013). It is best practice for treatment to involve family members (Faculty of Pain Medicine of the Royal College of Anaesthetics, 2021).

Paediatric chronic pain is known to have a significant impact on the lives of family members (Jordan et al., 2007). Parents of children with chronic pain report experiencing a wide range of difficulties (Campo et al., 2007; Palermo et al., 2014; Palermo & Eccleston, 2009). These can be emotional (such as feeling guilt, frustration and low mood), practical (such as competing career and caring demands), and social (such as problems maintaining connections outside the family) (Ngo et al., 2022).

Cognitive and behavioural responses of parents can influence the pain outcomes for their children. Pain catastrophizing, which involves parents ruminating on and feeling helpless about their child's pain, has been shown to be associated with paediatric pain intensity (Hechler et al., 2011). Parental pain vigilance is also implicated in the maintenance of childhood chronic pain. It is common for parents to pay extra attention to their child's pain symptoms and respond accordingly, by, for example, restricting their child's activities or reducing expectations of their child's functioning (Jaaniste et al., 2016). This understandable protective behaviour is associated with increased pain disability and pain interference in children (Birnie et al., 2020; Claar et al., 2008; Lipani & Walker, 2006).

A systematic review of the effectiveness of psychological interventions for parents of children with chronic pain found a small beneficial effect on child pain behaviour and disability outcomes (Law et al., 2019). In addition, small beneficial effects on parenting

behaviour and mental health outcomes were identified post-treatment. Studies evaluating intensive rehabilitation programmes for paediatric pain have identified improvements in parent functioning and reductions in both parental protective behaviours and parental pain catastrophizing (Benore et al., 2018; Kemani et al., 2018; Sieberg et al., 2017; Weiss et al., 2019). One study has found that these changes in parental cognition and behaviour are associated with improved child pain outcomes (Sieberg et al., 2017), while another has demonstrated a strong correlation between parental functioning and child functioning at 6-month follow up (Benore et al., 2018).

Qualitative research has shown that families and young people feel high levels of anxiety and frustration while waiting for interdisciplinary pain treatment (Palermo et al., 2019). Children also tend to experience a high burden of symptoms during waiting periods, significantly impacting their daily functioning. It has been suggested that a viable option to meet the needs of those waiting for more resource-intensive chronic pain treatment is to develop and deliver low-cost, time-limited interventions (Palermo et al., 2019), such as preclinical group education sessions for adult patients, which have been shown to increase use of pain management strategies and patient satisfaction (Davies et al., 2011).

Given the recognised effects of parental cognition and behaviours on the symptomology of chronic pain in children, several paediatric pain services have sought to develop and evaluate brief parent interventions (Kanstrup et al., 2016; Lee et al., 2021; Wallace et al., 2016). Putting Parents First – an inpatient adaptation of community-based programme Parents as Coping Coaches – is a three-session, cognitive-behavioural group intervention for parents of children with chronic pain, which includes pain education, develops distress-tolerance skills, and promotes adolescent autonomy. In a matched control pilot study, patients whose parents received the intervention made significantly better improvements in pain disability, coping and intensity than those whose parents did not

(Russell et al., 2020). The Comfort Ability Programme, another brief cognitive-behavioural intervention, is delivered to parents in a one-day workshop format and saw significant reductions in pain-reinforcing parent behaviours (Burns et al., 2022; Coakley et al., 2018).

Service Context

The Oxford Centre for Children and Young People in Pain (OXCYPP) delivers paediatric chronic pain rehabilitation treatment for a wide catchment area in South/Central England. The multi-disciplinary team comprises clinicians from physiotherapy, occupational therapy, psychology and rheumatology. Treatment is delivered in both outpatient and inpatient formats. The latter – intensive pain rehabilitation programmes – is offered to young people with severe and disabling levels of chronic pain. This is usually delivered in two-week blocks. The young person and one parent/guardian stay either at the OXCYPP site or a local hotel and receive a tailored timetable of input from across the multi-disciplinary team.

The service reports anecdotally that more families are now required to spend time on a waiting list before they are invited to attend intensive rehabilitation (the data on waiting times is not collected routinely). The clinical psychology team within the service would like to do more to meet the needs of this group but do not have additional resources to do so. Accordingly, they plan to develop a brief intervention that could be delivered online (meeting the access requirements of a target population dispersed across several counties) by staff members who are not necessarily qualified psychologists, such as Assistant Psychologists. Targeting parents of young people on the waiting list, the service aims to develop a group online workshop informed by existing research and the experiences of their service users.

Aims

This project aims to draw together findings from existing literature and qualitative data from parents of children who have recently received treatment in OXCYPP in order to inform the development of a brief parent intervention for families on the waiting list.

Research Questions

- What aspects of the parent-facing interventions did parents of children who recently used the service find helpful or challenging?
- What aspects of the parent-facing interventions would parents of children who recently used the service like to have received earlier than they did?
- What would a helpful workshop for parents of children waiting for the intensive rehabilitation service look like?

Methods

Ethics

This study received Quality Improvement (QI) approval from Oxford University Hospitals NHS Trust.

Participants

Participants were selected on the basis of meeting the following eligibility criteria: parents of young people who had attended OXCYPP's intensive pain rehabilitation programme between January and June 2023. Following initial telephone contact by the researcher, verbal and written information about the project was shared and verbal consent was taken.

A convenience 'slice' sampling strategy was chosen so that the participants could more easily remember their experiences of being on the waitlist and attending the

programme. Inviting all parents who attended the programme during a set time period offered a way to capture a heterogenous sample of service users (encompassing a range of positive and negative treatment experiences). Due to the fact that this study addresses focused questions about experiences of using one specific service, a relatively small sample size was felt to be appropriate (see Braun & Clarke, 2022 on the relationship between the breadth of research questions in qualitative research and sample sizes).

Design

This study has been designed to fulfil the stage 'selecting change' outlined in the Model for Improvement (Langley et al., 2009). This involves answering the question 'what change can we make that will result in improvement?', which must be addressed before service redesign begins. According to guidance from NHS Improving Quality (2014), this question can be answered by drawing on existing literature or learning from the experience of clinical experts and/or service users. The Model for Improvement recommends that, once this question has been answered, a Plan, Do, Study, Act (PDSA) cycle is completed in order to test whether the service has been improved (Langley et al., 2009). OXCYPP wanted to ensure that the development or adaptation of an intervention was informed by the experiences of those who have used the service. As such, it has been requested that this project gathers data to inform future cycles of implementation and testing.

A Reflexive Thematic Analysis (RTA) approach to qualitative research was used in this study (Braun & Clarke, 2021a). Data collection, analysis and reporting has been completed in accordance with the quality tool for evaluating thematic analysis (Braun & Clarke, 2021b). This tool differs partly from quality tools with broader application like the COREQ (Tong et al., 2007), in that it does not require researchers to address concepts which are 'theoretically incoherent' with RTA, such as data saturation and data triangulation

(through coder agreement or participant checking). Braun and Clarke argue that these practices which seek to reduce 'researcher bias' are not compatible with RTA, as the approach sees 'researcher subjectivity as a resource for research' and 'rejects the option that coding can ever be "accurate"… [as] meaning is not fixed within data' (Braun & Clarke, 2023).

Qualitative data was collected via semi-structured interviews with parents of young people who attended the pain rehabilitation programme. The interviews were conducted online and ranged between 25–70 minutes in length. Participants were asked questions about their experiences of attending the intensive programme with their child (see Appendix 2.2 for the interview framework). The interviews were audio recorded and transcribed manually.

Drawing both on existing research findings and the results of this study, recommendations have been made to OXCYPP for their plan to develop a brief intervention for parents of children on their waiting list. These recommendations have been fed back directly to the Service Lead in written format and via a presentation in a OXCYPP team meeting.

Analysis

Themes have been developed in this study using Reflexive Thematic Analysis (RTA) (Braun & Clarke, 2021a). A deductive orientation was adopted, 'using pre-existing theory as a lens through which to interpret the data' (Braun & Clarke, 2022; see also Braun & Clarke, 2021b). This approach offered a flexible way to guide the analysis with reference to psychological theories of paediatric pain (especially the literature cited above on how parent wellbeing and cognitive and behavioural responses can influence pain outcomes for children).

As is often the case in RTA, themes were developed through an iterative process (Braun & Clarke, 2021b). After a period of familiarisation with the data, which included the process of transcribing, reading, and re-reading the interviews, codes were created using

NVivo software. This involved paying close attention to all parts of the data, and making notes on aspects of the data which were interpreted as holding meaning for the participants. Once codes were finalised, in the form of an ungrouped list, RPD looked for patterns and dissonances across the transcripts and codes. These patterns were then developed into three 'central organising concepts', which Braun et al (2014) argue is what differentiates themes in RTA from more descriptive topic summaries. In this study, codes and themes were created with the explicit awareness and influence both of psychological theories of paediatric pain and the researcher's own position and assumptions (see Appendix 2.3).

Results

Demographics

Attempts were made to contact all 12 parents who attended the intensive rehabilitation programme with their child within the recruitment window. All eligible parents were from separate families. Four could not be contacted during the data collection stage, despite repeated attempts. Eight agreed to book times for interviews. Two did not attend their interviews or respond to follow-up contact. Therefore, six parents participated in interviews. All six were female, between the ages of 40 and 55. Two were parents of autistic young people.

Themes

The themes encapsulate different aspects of the participants' experiences of attending the intensive pain rehabilitation programme as parents.

<u>Theme 1: Learning and Adapting</u>

Participants clearly valued the structured components of the programme in which they learned more about what chronic pain is and how to respond to it. As one parent reported, 'when she [the OT] explained it to me, I actually – the nerves and stuff – I actually got it then'. Understanding pain was the first step for parents in learning more about how to respond to their child's pain symptoms. For some, this involved being encouraged to challenge pain avoidance behaviours in their child. One noted that 'learning about pacing and things like that actually helped me to push [my child] more'. Another described gaining the conviction to be able to say to her child 'yeah, you're in pain; yeah, we get that. But you've got to get on with it.'

Parents also spoke about learning that it can sometimes be unhelpful to draw their child's attention to the pain. One parent explained that 'from now on, if she says to me that she has pain, I acknowledge it. I say "yeah, OK". But then I don't make too much of a fuss about it. We move on.' This concept was summed up by one participant who likened focusing attention on their child's chronic pain to 'feeding the monster', something that they now avoid.

Participants found it helpful to learn practical pain management strategies. One parent who found it hard to distract their child from the pain said that they valued the programme giving them ideas: 'you know, so for [my child] it was baking. We started watching programmes together. So we'd watch *Bake Off* or we'd watch *Stranger Things* or... And we'd talk about them.' Another spoke about being shown ways to integrate rest breaks for their autistic child who hated being mentally unstimulated, which involved 'learning that relaxing can still be his brain going. Just relaxing his body parts, the tricky bits, [made it possible] to ease the pain in his feet and legs and hips, but actually left his brain still going. So we'll sit and play a game or we'll watch a little video on my phone.'

Theme 2: Heard and Held

All participants attached great significance to experiences in the intensive programme that helped them to feel understood and supported with the emotional challenges of caring for a child with chronic pain. These occurred both within scheduled appointments and more informally between sessions. Several parents arrived at the intensive programme having had the experience of being judged or treated dismissively by family, friends and professionals (including, in one case, being threatened with social services when her child stopped attending school). Parents also alluded to feelings of guilt and responsibility for their child's pain, asking themselves questions such as 'What have I done wrong?' As a result, participants strongly valued being listened to without judgement by professionals on the programme. In contrast to their previous experiences, one parent found it to be a 'safe, lovely bubble, where everyone understood'.

Parents found value in having space away from their child to talk through their own feelings. One participant described appreciating having the opportunity 'to be more honest without worrying about upsetting this child's feelings'. They also spoke about how helpful it was to have their distress acknowledged. As one put it, 'All you ever get is: '"Be strong, be strong. Just get on with it." And it's like… but how? How can you just keep being strong?' Nearly all parents interviewed had seen their child go through repeated medical investigations and struggle to attend school. They were used to seeing their children in near-constant pain. For some, this meant that they arrived at the intensive programme desperate to be given some hope. One parent explained how 'you just want to grip on to something and say, "it's going to get better, it's going to be OK"'. Several interviewees said that the 'positive' attitude of clinicians on the programme helped them in this respect.

Every parent interviewed spoke about how much they appreciated the opportunity to build relationships and share experiences with their peers (parents of other children using the

service). One mother went as far as to say that 'I've made one of my best friends through going to [the intensive programme]'. This friendship was so valuable, she said, because when one of them feels overwhelmed, 'we don't even have to say some things to each other. We just know. You just get it.' One mother described hearing other parents talk about their struggles with not feeling listened to by medical professionals and thinking 'oh my god, that happened to me!' Participants also found it easier to hear certain messages from other parents, because 'they [the staff] can tell you until they're blue in the face that what you're feeling is normal. But if you hear it from the mouth of someone that's either going through it or has been through it, it almost has more impact.'

Theme 3: Overwhelmed and Underprepared

A key theme across the interviews concerned ways that the intensive programme itself could have been improved through contact with OXCYPP before arriving, either through a workshop or other channels of communication. Every parent described not knowing what the intensive programme would involve before they arrived. One interviewee stated that 'we'd initially rocked up on the Monday morning not knowing – completely in the dark'. Another recalled: 'They talked about the intensive programme. Well, I didn't have a clue what that meant.'

Several participants noted that they had differing expectations of what the service's role was and how their child's pain would be approached. For example, three parents said that they arrived at the intensive programme expecting further investigations into medical causes for their child's pain. Parents also spoke repeatedly about their wish to have known more practical information before arriving at the two-week programme, including the timings of the days, whether food would be available nearby, and what the accommodation facilities would be like.

Participants described several knock-on effects of not knowing what to expect. Three interviewees noted feeling anxious before and during the programme because of the uncertainty caused by the lack of some basic practical information, such as what they might need to bring with them. As one interviewee stated, 'We got our timetable on the morning we arrived. We didn't know what was going to happen or what to expect […] I was quite anxious about going.' One mother drew a connection between her feeling anxious and the impact it might have had on her daughter's experience of the programme. If she had had more information, she said, 'I would have probably been a calmer, more reassuring presence for her, which would have helped her'.

Anxiety resulting from uncertainty about timings was felt to be a particular barrier for autistic young people. One mother of an autistic child pointed out that 'giving that little bit of information can just make somebody's life so much easier in getting them there or not having a meltdown or actually learning something because they're in the right mindset, because they're not worried or anxious about what's behind that wooden door'. Helping patients and their families know what to expect from intensive programme could therefore be an important way for the service to adapt to the needs of neurodiverse children and their families.

Parents spoke about struggling to take in information about what to expect on the intensive programme. Several participants acknowledged that they might have been given the information, but said that they had not been able to process it. For example, one mother said, 'I don't know whether they did explain it [how the intensive rehabilitation programme works], but it just wasn't explained, maybe not clear enough to me at the time because I was still thinking we were going to get a solution to [the pain].' Similarly, another parent said that 'they talked about rehab, [but] we still didn't really have a clue!'

Taking in the quantity of information provided during the intensive programme itself was also a challenge for parents. A participant said she was 'trying to make notes. But actually I was like, "but what did they say? Like, what was that word that they used?" And like, well, actually I don't really know what that means so I want to google it. But actually I didn't have enough time to write it down to think about what that word means.' Giving information more clearly in advance of the programme could be one solution to this. The same parent suggested that this might mean that 'you can process that first. And actually when you go in and they start trying to then help you, you've already got that baseline and actually you can question it. Whereas [at the moment] you kind of are taking it all in [at once] and then you go away and have questions.' According to this participant, then, it may be more efficient to process information and identify questions in advance of the intensive week.

Recommendations

The recommendations that follow have been shaped by the results of this RTA and by the existing literature on parent interventions for paediatric chronic pain, reviewed in the Introduction. Some of the recommendations relate to establishing a parent intervention; others extend into other aspects of service improvement.

1. Brief Parent Intervention

1.1 Parents appreciated being given guidance around how to respond to their child's pain. The workshop could usefully provide information about how pain avoidance maintains the cycle of chronic pain and paying attention to pain can make it worse, as well as practical advice on how to build in distractions and resting time for young people.

1.2 The workshop should dedicate space to hearing and validating parent distress and concerns, while balancing this with nurturing their hope for their child's future.

1.3 Given the value parents placed on hearing the voices of and forming relationships with their peers, the workshop should be delivered in a group format. The service could also consider following the example of the Comfort Ability Programme by including a 'parent mentor/guest speaker' (Burns et al., 2022).

1.4 To help families feel more prepared when they arrive at the intensive programme, information about it should be shared during the workshop for parents of children on the waiting list. The service could tell parents:

- about the purpose and goals of intensive rehabilitation;
- about the roles and professions of clinicians;
- practical information about the likely structure of the programme.

2. Wider service improvements

2.1 In order to assess whether the brief parent intervention is successful in reducing waiting list times, the service needs to implement the systematic collection of data on the dates referrals to the inpatient programme are made and accepted, and the dates that treatment commences for each family.

2.2 As most interviewees reported arriving at the programme without a clear understanding of what chronic pain is, prior attendance of the pain education session that OXCYPP currently runs could be made a compulsory step. It could be helpful for the pain education session to be a precursor to the parent workshop, as this would allow the workshop to cover more practical material around how to respond to pain.

2.3 The service is encouraged to consider establishing a parent peer forum, where parents can form their own support networks and experience some of the benefits outlined in the interviews (such as feeling less alone and receiving advice and ideas).

2.4 Written handouts should be integrated into both the intensive programme and the brief parent intervention. This could be particularly helpful for pain management components, which require parents to process and remember more complex information.

2.5 The service is advised to develop more resources to help prepare families for the intensive programme and send them out at least a week in advance. The materials could usefully include an example timetable, pictures of staff with their names and roles explained, pictures of the family rooms and facilities, and information about the two different sites.

2.6 Extra attention should be paid to communication with families of autistic young people. More visual aids and information about what to expect could reduce families' anxiety and improve access to the programme for neurodivergent young people.

It is recommended that the service evaluates the effectiveness of the workshop once it has been implemented. As discussed above, this could follow on to the next stage of Model for Improvement, which would involve completing a PDSA cycle (Langley et al., 2009). Useful outcomes to assess could include 1) the acceptability and feasibility of the intervention, 2) the impact on parental coping and resilience, and 3) pain outcomes for their children (such as pain disability).

Discussion

This study explored the aspects of a paediatric intensive pain rehabilitation programme which parents found useful and considered how to bring some of these benefits to parents of children on the service's waiting list. Participants reported that the pain management aspect of the programme shaped the way they respond to their child's pain and that the emotional

support that they received from professionals and peers had been an important source of resilience. However, they felt that their experience of the programme could have been improved through clearer communication that helped to clarify expectations, reduce anxiety, and make information easier to digest. Based on these findings and a review of existing literature, recommendations have been made about how to implement a brief intervention for parents of young people on the waiting list.

A striking finding in this study was the degree of lasting emotional support that parents gained from their peers as a result of attending the intensive programme. Other qualitative research has identified social support as a critical factor in enabling parents to meet the needs of children with chronic pain (Le et al., 2019). One third of parents taking part in the evaluation of the Comfort Ability Programme (discussed in the Introduction) reported finding social connection with other parents in the intervention particularly beneficial (Burns et al., 2022). With this in mind, a group parent intervention could not only be practical in terms of service resource, but also provide sustained therapeutic benefits via peer interactions between participants.

Although the brief interventions discussed in the literature review focused on delivering a self-standing therapeutic intervention, this study's findings indicate that in the case of OXCYPP at least some of the workshop could usefully be dedicated to clarifying expectations and providing information about the intensive programme. A recent report investigating the experiences of NHS patients waiting for care found that communicating information clearly 'has an impact on patients' sense of control and their ability to manage uncertainty' (NHS England, 2021). Timeliness is a key factor here. A national review of how information is shared with adults in chronic pain services found that, while many patients felt that they were communicated with well, the timing of the communication was less effective, leaving them 'often poorly informed about what to expect from a pain service before they

attend for treatment' (National Institute for Health and Care Excellence, 2021). Despite the small sample size, the present study suggests that the experience of parents of young people with chronic pain may be similar. Especially given the degree to which these parents felt that communication and information sharing impacted on their and their children's engagement with the intensive programme, this issue warrants further research.

Problems with communication were a particular source of stress for participants with autistic children. A growing body of research indicates that the prevalence of chronic pain in autistic children and adults alike is higher than in the general population (Asztély et al., 2019; Whitney & Shapiro, 2019; Wiwe Lipsker et al., 2018). Making care accessible to neurodivergent patients should therefore be a priority for chronic pain services. Guidelines on reasonable adjustments in autism across all forms of healthcare suggest 'minimising uncertainty' through a range of communication adaptations such as providing more detail about upcoming treatment, offering 'acclimatisation visits or virtual tours' of clinic spaces, using written and visual aids, and ensuring that information sharing happens as early as possible in the treatment experience to maximise processing and preparation time (Haydon et al., 2021).

Limitations

As noted above, although the recommendations have been informed by the qualitative data and other evidence-based interventions, they have not yet been implemented or tested through a full quality improvement cycle. Moreover, there are limits to the conclusions we can draw from the data gathered here. Although the results here have been used to inform service-specific recommendations, generalisable findings cannot be extrapolated from qualitative research (with a relatively small sample size). The fact that data was not collected systematically on the specific clinical presentations of children whose parents participated

also limits the generalisability of the findings; it is possible that parents supporting children with different chronic pain presentations have very different needs. The convenience recruitment strategy was designed to provide a sample of parents who recently used the service. By using a 'slice' approach, it was hoped that participants with a range of positive and negative experiences of the programme would be captured in the sample. However, there may have been a degree of self-selection in the parents who chose to participate (those who took part in the interviews may have had especially positive or negative experiences that they felt strongly about sharing). Without data on the characteristics of the 50% of invited parents who did not agree to participate, it is not possible to assess whether demographics were skewed by self-selection. There were no fathers in the sample, although this did reflect the fact that is much more common for mothers to attend the programme with their children, likely due to the time commitment required and family working patterns.

This study focused on the retrospective accounts of parents. Due to scope, it did not gather data on the pain outcomes for participants' children, or incorporate the views or experiences of young people. This decision was informed by theoretical accounts of paediatric chronic pain, which locate parental cognition and behaviour as key maintaining and recovery processes affecting child outcomes (Jaaniste et al., 2016, Lipani & Walker, 2006). Future research could consider exploring whether there is a relationship between parental experiences of paediatric chronic pain services and their children's qualitative experiences and pain outcomes in the short and longer term. Studies focusing on this question could shed further light on the mechanisms by which changes to parental cognition and behaviour impact on paediatric chronic pain.

For pragmatic reasons, this study did not include the perspectives of parents whose children are currently on the waiting list for intensive pain rehabilitation. This decision was made because clinicians in the service described seeing large shifts in what parents reported

needing from the service once they attended the programme. While parents on the waiting list often requested further medical investigations for their child, those whose had learned about chronic pain from the programme typically asked the service for help with different needs. The project therefore relied on retrospective reporting from parents on what they remember their needs being while waiting. This increases the risk that an intervention could be developed which does not clearly meet the needs of parents during this period of waiting. Future research could explore whether their perspectives align or mismatch with those of parents reporting retrospectively or perhaps follow a longitudinal cohort of parents across their treatment journey.

Conclusions

To meet OXCYPP's request to inform the development of a brief intervention for parents of children on its waiting list, this study explored the experiences of parents who had attended a paediatric intensive pain rehabilitation programme. Although participants valued the new knowledge and skills and emotional support they gained from the programme, they also reported increased anxiety and confusion relating to unclear or untimely communications. Recommendations have been made to the service, which include testing the effectiveness of the proposed new intervention through a quality improvement cycle.

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Theory-Driven Research Project

To what extent do mental defeat and somatic hypervigilance mediate the relationship between childhood maltreatment and chronic pain symptomology in adults with fibromyalgia?

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Internal Supervisor: Dr Neil Carrigan

External Supervisor: Dr John Pimm

Proposed Journal: The Clinical Journal of Pain (a leading journal which has published research looking at the role of mental defeat in chronic pain)

Abstract

Adults with experience of childhood maltreatment are at higher risk of developing fibromyalgia (a form of chronic pain). The cognitive-behavioural transdiagnostic model for medically unexplained symptoms suggests that cognitive and behavioural factors play a role in maintaining conditions such as chronic pain. This study used a cross-sectional observational design to test two possible mediators in the relationship between childhood maltreatment and chronic pain severity: mental defeat and somatic hypervigilance. It also tested the role of mental defeat as a mediator between childhood maltreatment and three sub-domains of pain severity (intensity, distress, and disability). Mental defeat fully mediated between childhood maltreatment and pain severity, while somatic hypervigilance was not a significant mediator. Mental defeat also fully mediated the link between childhood maltreatment and pain distress, but not pain intensity or disability. These findings are situated in relation to existing research on childhood adversity and chronic pain, and research, clinical, and policy implications are discussed.

Keywords: childhood maltreatment, fibromyalgia, chronic pain, mental defeat, somatic hypervigilance

Introduction

Chronic pain is estimated to effect between one third and one half of the UK population (1,2). Fibromyalgia syndrome is a diagnosis of chronic primary pain and is characterised by widespread and persistent pain alongside a range of other symptoms such as fatigue and insomnia. It has an estimated prevalence of 5.4% (3). Many people with fibromyalgia feel dissatisfied with available treatment options (4,5) and would prefer non-pharmacological therapies (6–8). There is thus an imperative for researchers to refine and develop psychological therapies for fibromyalgia. This study contributes to that larger goal by proposing and testing novel answers to the question of how chronic pain symptomology relates to individual life histories and associated patterns of cognition and behaviour.

More specifically, it focuses on the link between childhood adversity and chronic pain in adulthood. Since the 1990s, the disproportionate occurrence of childhood maltreatment among patients in healthcare settings has been revealed in numerous large-scale studies using the Adverse Childhood Experiences (ACEs) questionnaire (9–11). Many of these have gone on to report an association between childhood maltreatment and chronic pain (12–16). This finding has been replicated across a range of chronic pain conditions including fibromyalgia (17–19). A dose effect has also been identified: that is, experiencing a higher number of ACEs is associated with a higher level of chronic pain interference and clinical complexity (20,21).

While there is strong evidence for an association between childhood maltreatment and chronic pain, we have only a limited understanding of the underlying mechanisms (22). One framework that may shed light on the connection is the cognitive-behavioural transdiagnostic model for persistent physical symptoms (PPS) (23). The transdiagnostic model draws on fundamental components of cognitive theory, arguing that negative appraisals of health-related information, shaped by prior beliefs about the world and self, generates emotional and

behavioural responses which maintain distress and disability in PPS (23). By this account, the relationship between childhood maltreatment and chronic pain is likely mediated, at least to some extent, by habituated patterns of cognition and behaviour. This study contributes to the broader debate about PPS and the transdiagnostic model by investigating whether two specific constructs – mental defeat and somatic hypervigilance – mediate the relationship between childhood maltreatment and chronic pain in adults with fibromyalgia.

The first construct, mental defeat, is defined as a state of 'perceived loss of all autonomy' in which individuals give up on attempts to retain their identity as self-determined human beings and feel they lack the internal resources to cope with threats (26). The phenomenon was first identified in the context of post-traumatic stress disorder resulting from deliberate imprisonment and torture (27). Mental defeat has yet to be explored in relation to childhood maltreatment. However, given that chronicity of trauma has been shown to play a key role in its development (27), it seems plausible that mental defeat is prevalent among those who have experienced severe and enduring childhood abuse and neglect. This supposition is supported by research showing that reduced self-efficacy – a related concept to mental defeat defined as 'people's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives' (28) – is associated with childhood adversity (29,30).

Mental defeat has already been found to be strongly implicated in the experience of chronic pain (31). Tang et al. (32) demonstrated a strong association between mental defeat and levels of interference, distress, and particularly psychosocial disability in chronic pain. The association between mental defeat and pain intensity appears to be less strong (33). Mental defeat has also been found to be the most significant predictor of pain symptomology among factors including anxiety, depression, catastrophising, and hopelessness (34). When considered in relation to the transdiagnostic PPS model, it may be that when mental defeat (a

set of beliefs about the self) is activated, cognitive appraisals of health-related information and behavioural responses are influenced in such a way that symptoms of chronic pain are maintained.

The second construct is somatic hypervigilance. According to the transdiagnostic PPS model, this cognitive strategy – paying extra attention to bodily signals – is activated when people appraise certain sensations as being indicative of serious illness. Increased attention to somatic signals, in turn, forms a feedback loop whereby negative interpretations of symptoms increase (23). There are parallels here with the Fear-Avoidance model of pain, which locates the development of chronic pain in a vicious cycle of hypervigilance and avoidance behaviours (35). Previous studies have shown that individuals with chronic pain display heightened hypervigilance to pain, and that paying closer attention to pain is associated with worse outcomes on a wide range of pain measures (36–39).

As the theory of latent vulnerability explains, one reason why people who experience childhood adversity have poorer transdiagnostic psychological outcomes is that prolonged childhood maltreatment can lead to 'increased hypervigilance to threat' (40). Drawing on evidence from cognitive-behavioural and neuroimaging paradigms, McCrory and Viding (40) argue that maltreated children encode a greater proportion of non-threat-related information as threats, leading to behavioural responses such as avoidance that prevent disconfirmation (41). Given that pain is first and foremost a threat signal – with the purpose of cognitively interrupting to protect the body from potential tissue damage (42) – the combined insights of the theory of latent vulnerability and the transdiagnostic PPS model provide strong grounds to investigate whether somatic hypervigilance mediates the relationship between childhood maltreatment and chronic pain. This hypothesis aligns with proposals elsewhere that heightened threat sensitivity as a result of changes in the central nervous system plays a role in the link between childhood maltreatment and adult pain (43).

On the basis of theoretical and empirical findings drawn from existing research on chronic pain, PPS, childhood maltreatment, and trauma, this study proposes mental defeat and somatic hypervigilance as potential mediators in the relationship between childhood maltreatment and chronic pain. The primary research aim was to determine whether (a) mental defeat and (b) somatic hypervigilance mediates this relationship. If either factor was found to be a mediator, the secondary aim was to unpack these associations in more detail, by exploring to which of three sub-components of pain severity (intensity, disability, distress) the mediation pertained.

Methods

Design

This study used a cross-sectional design, collecting data via an online questionnaire between December 2023 and January 2024. It was given favourable opinion by Wales 1 Research Ethics Committee (23/WA/0316) (Appendix 3.1).

Participants and Recruitment

This study recruited people over the age of 18, living in the UK, with a clinical diagnosis of fibromyalgia (all determined by self-report). Approval was initially sought for recruitment to be completed in parallel both online and via an NHS pain management service. However, recruitment was so successful through posting in social media support groups that it was not necessary to recruit patients from the pain management service. Participants from the general population were recruited via an advert shared in fibromyalgia support groups on Facebook. The questionnaire included a required CAPTCHA test, in order to determine if a response was automated.

Fritz and Mackinnon (44) conducted simulation analyses to create a set of reference estimates of required sample sizes to detect a range of effects in the context of mediation analysis. In order to use their work to select an adequate sample size, two relevant effect sizes need to be estimated: the first between the predictor and mediator, and the second between the mediator and outcome. No previous literature has reported comparable effect sizes for the relationship between childhood maltreatment and either mental defeat or somatic hypervigilance. Therefore, a medium effect size was assumed. Prior studies have shown that effect sizes between mental defeat and pain outcomes (such as pain disability and interference) are between medium to large (32,33). Effect sizes for the relationship between somatic hypervigilance and pain outcomes have been reported as medium (36,37). Using Fritz and Mackinnon's simulation results, it was estimated that a sample of 78 participants would detect the mediation effect, setting alpha level at .05 and power at 0.8, if a bootstrapping method was employed.

Procedure

Participants completed the questionnaires remotely at their convenience. They were informed in advance that taking part would involve being asked whether they had experienced child abuse or neglect. Participants were presented (throughout and at the end of the study) with information about where to seek support for any distress experienced. Those who left the study early, who were sent an automated email with the same signposting information.

Measures

The Initiative on Methods, Measurement, and Pain Assessment in Clinical Trials (IMMPACT) proposes that chronic pain cannot simply be understood in terms of intensity levels (44). Turk et al. (44) argue that, to capture clinically meaningful data, pain intensity

should be measured alongside emotional and physical functioning in relation to pain. Therefore, in the present study, a pain severity composite measure has been created from items measuring pain intensity, pain distress, and pain disability (see Pain Severity Index below).

Childhood maltreatment: The Maltreatment and Abuse Exposure Scale (MAES) is a 52-item self-report tool gathering data on ten types of maltreatment (45). Higher scores (from 0 to 52) show greater exposure to maltreatment. A systematic review indicated that the MAES had the strongest psychometric properties among the five most recurrently validated measures of child maltreatment (46). There is good evidence for its structural validity, criterion validity, and test-retest reliability. In this study, it was found to have strong internal consistency (α = 0.94).

Mental defeat. The Pain Self-Perception Scale (PSPS) measures pain-related mental defeat with 24 items scored on a 5-point Likert scale. It asks participants to recall a recent episode of intense pain and rate how much a statement applies to this experience (0 = 'Not at all/Never, 4 = 'Very strongly'. Higher scores (from 0 to 96) represent higher levels of mental defeat. It has been found to be internally consistent and have good test-retest reliability (31). In the present study, it showed high internal consistency (α = 0.97).

Somatic hypervigilance: The Pain Vigilance and Awareness Questionnaire (PVAQ) measures participant vigilance and preoccupation with pain. Its 16 items ask participants to indicate on a six-point scale the relevance of statements over the last two weeks (0 = 'Never', 5 = 'Always'). Higher scores (from 0 to 80) show increased pain hypervigilance. It has been

validated and found to be reliable in patients with fibromyalgia (47). It demonstrated good internal consistency in this study ($\alpha = 0.88$).

Pain intensity. The Brief Pain Inventory (BPI) is a 15-item measure used to gather data on pain intensity and interference. Its pain intensity subscale uses four numeric rating scales (0 to 10) to measure the strength of someone's recent pain. The final score is calculated as the mean. Higher scores (from 0 to 10) indicate worse pain intensity. It has been well validated for use with chronic pain patients (48) and in this study demonstrated high internal consistency ($\alpha = 0.89$).

Pain distress. While other psychosocial pain studies tend to use the Hospital Anxiety and Depression Scale (HADS; 49) to measure pain-related distress, it was decided that using a tool which assesses anxiety and depression without reference to pain experience risked compromising internal validity in the present study. Childhood maltreatment is strongly associated with anxiety and depression (50). As this study concerns childhood maltreatment as an independent variable, it would not be possible to claim that a general measure of anxiety and depression was capturing a 'distress' construct specifically related to pain.

Consequently, a single-item measure was developed for this study (Appendix 3.3). It asked participants to rate how distressed they felt in the last week as a result of their pain, using a numerical rating scale of 0 to 10. Because this measure explicitly references pain, the author anticipated that it would correlate with pain intensity and pain disability. The data collected showed that this measure of pain distress was correlated with pain intensity ($r = 0.7$, $p < .001$) and pain disability ($r = 0.69$, $p < .001$).

Pain disability. The Pain Disability Questionnaire (PDQ) measures functional and psychosocial disability resulting from chronic pain. It comprises 15 items asking participants to choose a number between 0 and 10 to indicate the impact pain has had on a range of activities. The score is calculated by summing responses. Higher scores (from 0 to 150) representing more severe levels of disability. The PDQ has been found to have strong internal consistency and test-retest reliability (51). In this study it was found to have high internal consistency ($\alpha = 0.94$).

Pain severity. To build overall composite of pain experience (the Pain Severity Index), it was hypothesised that aspects of pain intensity, pain distress, and pain disability measured in the scales above, would convey a general index of pain severity. To create a composite measure representing overall pain severity, an exploratory factor analysis (EFA) was conducted on the 20 items using a principal axis factoring extraction method with oblique rotation. Sampling adequacy was verified using the Kaiser-Meyer-Olkin measure (KMO = 0.9), and all items displayed KMO values of over 0.83, which is considered to be above the acceptable limit (52). Bartlett's test of sphericity, χ^2 (190) = 1479, p <.001, indicated that correlations between items were large enough for EFA. Eigenvalues were obtained for each factor in the data. Using parallel analysis, two factors were identified which together explained 56.8% of the variance. Factor loadings are displayed in Table 1.

Table 1.

EFA factor loadings

	Factor		
Item	**1**	**2**	**Uniqueness**
1. Please rate your pain by selecting the number that best describes it at its *worst* in the last 24 hours.		0.67	0.42
2. Please rate your pain by selecting the number that best describes it at its *least* in the last 24 hours.		0.74	0.38
3. Please rate your pain by selecting the number that best describes it *on average* in the last 24 hours.		0.84	0.32
4. Please rate your pain by selecting the number that tells how much pain you have *right now*.		0.79	0.41
5. Please rate how much distress your pain has caused you in the last week.		0.84	0.38
6. Does your pain interfere with your normal work inside and outside the home?	0.63		0.43
7. Does your pain interfere with personal care (such as washing, dressing, etc)?	0.74		0.30
8. Does your pain interfere with your travelling?	0.76		0.38
9. Does your pain affect your ability to sit or stand?	0.80		0.36
10. Does your pain affect your ability to lift overhead, grasp objects, or reach for things?	0.75		0.28
11. Does your pain affect your ability to lit objects off the floor, bend, stoop, or squat?	0.90		0.34
12. Does your pain affect your ability to walk or run?	0.87		0.33
13. Has our income declined since your pain began?	0.65		0.55
14. Do you have to take pain medication every day to control your pain?	0.65		0.58
15. Does your pain force you to see doctors much more than often than before your pain began?	0.36		0.76

16. Does your pain interfere with your ability to see the people who are important to you as much as you would like?	0.47	0.34	0.44
17. Does your pain interfere with recreational activities and hobbies that are important to you?	0.44	0.35	0.47
18. Do you need the help of your family and friends to complete everyday tasks (including both work outside the home and housework) because of your pain?	0.80		0.42
19. Do you feel more depressed, tense, or anxious than before your pain?		0.54	0.59
20. Are there emotional problems caused by your pain that interfere with your family, social and/or work activities?		0.52	0.53

Note: All items presented respondents with a numerical rating scale from 0 to 10. 10 always represents the highest levels of pain intensity, distress and disability.

While Factor 1 only clustered items relating to pain disability, Factor 2 contained items across intensity, distress and disability. As the study is concerned with measuring pain across all three domains, the items identified in Factor 2 were selected to create the composite measure. An equally-weighted average (mean) was used to calculate the overall score. Scores range from 0 to 10, with the latter representing higher pain severity. In this study, the Pain Severity Index was found to have strong internal consistency ($\alpha = 0.91$). See Appendix 3.4 for the composite measure.

Statistical Analyses

As it was set as a requirement on the online survey for participants to answer all items, missing data only occurred when participants did not finish their responses (13.11%, $N = 16$). None of these participants gave complete responses to the MAES. As it is not possible to compute a score for the MAES without complete answers, these participants were not included in the final analysis. Two-tailed significance levels were set at .05. Descriptive

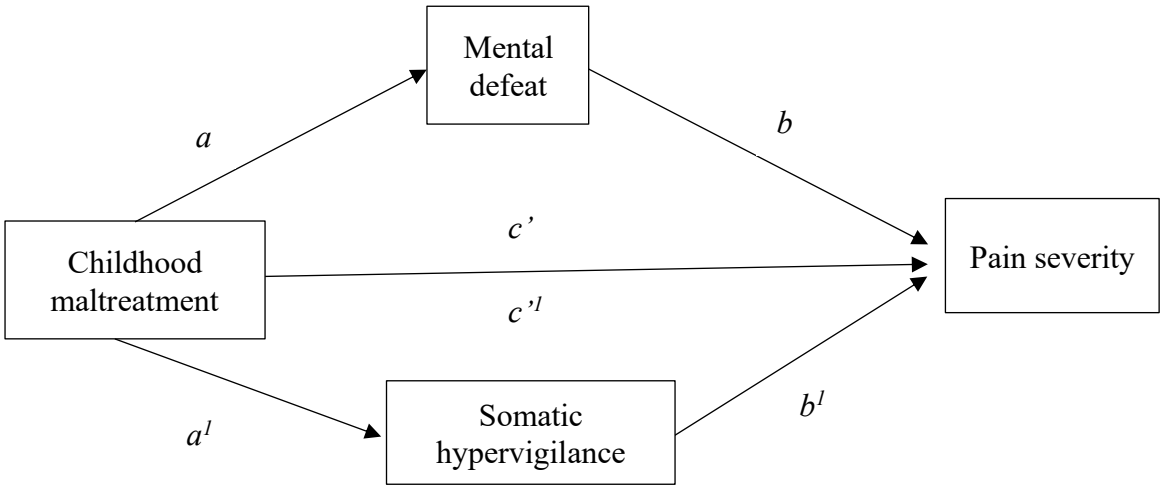
statistics were produced for sample characteristics and all study measures. The associations between variables were then assessed using a correlation analysis.

To answer the primary research questions, a parallel mediation model (see Figure 1) was tested, employing bootstrapping techniques (1000 samples) to address any potential non-normal distribution (53). 95% confidence intervals were all calculated using percentile bootstrap methods. Mediation analysis calculates the indirect effect of a predictor on an outcome variable via proposed mediator (*ab* in Figure 1*)*. It also computes the direct path (*c')* between predictor and outcome, controlling for the mediator. Full mediation is demonstrated when the direct path *(c')* is not significant, but an effect is seen in the indirect path via the mediator (*ab)* (54,55).

To answer the secondary research question, three separate mediation analyses (using 1000 bootstrap samples) were conducted with the full pain intensity, distress and disability subscales as outcome variables. Analysis was performed using the GLM Mediation Model module in Jamovi software version 2.3.28 (56–61).

Figure 1.

Path diagram showing the parallel mediation model



Results

Descriptive analysis

Of the 122 participants who consented to take part, 16 were excluded due to incomplete responses. Seven of the remaining 106 did not meet the internal validity criteria for the MAES, indicating possible automated or inaccurate responses. These were excluded, leaving 99 participants in the study. The majority of participants were female (98%). Participants ranged in age from 18 to 72 years ($M = 45$, $SD = 11.9$). Descriptive statistics were calculated for clinical measures (Table 2).

Correlation analysis

A correlation analysis was conducted to test associations between study variables. Table 3 displays *r* values for all study variables. Childhood maltreatment was not associated with pain severity or any of its subscales, nor somatic hypervigilance, but was weakly associated with mental defeat. All other variables were significantly positively associated with each other.

Table 2.

Descriptive statistics for clinical measures

Variable (N=99)	*M*	*SD*	95% Confidence Interval
Pain Severity Index	6.72	1.55	6.41 – 7.03
BPI (Intensity subscale)	5.9	1.6	5.59 – 6.22
Pain Distress Score	6.91	2.17	6.48 – 7.34
PDQ	103	26.8	97.5 – 108
PSPS	64.6	21.8	60.3 – 68.9
PVAQ	43.2	12.8	40.7 – 45.8
MAES Severity Score	33	18.6	29.3 – 37.6

Table 3.

Matrix (n=99) showing Pearson's correlation coefficients.

	1	2	3	4	5	6	7
1. Pain severity							
2. Pain intensity	0.89***						
3. Pain distress	0.80***	0.70***					
4. Pain disability	0.83***	0.69***	0.57***				
5. Mental defeat	0.57***	0.38***	0.52***	0.48***			
6. Somatic hypervigilance	0.46***	0.40***	0.34***	0.39***	0.48***		
7. Childhood maltreatment	0.20	0.15	0.10	0.20*	0.24*	0.06	

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

Mental defeat and somatic hypervigilance as mediators

A parallel mediation analysis was used to test the primary research questions (see Table 4). *This tested the two proposed mediators in the relationship between childhood maltreatment and pain severity (the composite pain measure).* This showed that mental defeat fully mediated the relationship between childhood maltreatment and pain severity. The indirect effect of the relationship (β = 0.11, 95% CI [0.002, 0.019], p = .047) was significant. This was reduced to a non-significant effect when mental defeat was controlled for (β = 0.07, 95% CI [-0.007, 0.020], p = .34).

In the same model, somatic hypervigilance was not found to mediate the relationship between childhood maltreatment and pain severity. The indirect relationship effect was not significant (β = 0.02, 95% CI [-0.003, 0.007], p = .59).

Table 4.

Parallel mediation analysis

Model	Estimate	β	*SE*	95% CIs	*p*
<u>Model 1</u> Childhood maltreatment → mental defeat → pain severity	0.009	0.11	0.004	0.002 – 0.019	.047
Childhood maltreatment → mental defeat	0.285	0.243	0.112	0.071 – 0.512	.01
Mental defeat → pain severity	0.031	0.434	0.008	0.017 – 0.048	<.001
<u>Model 2</u> Childhood maltreatment → somatic hypervigilance → pain severity	0.001	0.02	0.002	-0.003 – 0.007	.59
Childhood maltreatment → somatic hypervigilance	0.044	0.064	0.073	-0.101 – 0.184	.55
Somatic hypervigilance → pain severity	0.030	0.247	0,013	0.004 – 0.056	.03
<u>Direct path</u> Childhood maltreatment → pain severity	0.006	0.07	0.006	-0.007 – 0.020	.34

Mental defeat as a mediator for pain intensity, distress and disability

In order to investigate the indirect effects of mental defeat on the three subtypes of pain (intensity, distress and disability), three further mediation analyses were conducted using the separate pain subscales outlined in the Methods section (Models 3, 4 and 5; Table 5). A significant effect was only found for the indirect path of Model 4, with the outcome variable of pain distress (β = 0.13, 95% CI [0.003, 0.031], p = .03). The effect was shown to be non-significant when controlling for pain distress (β = -0.03, 95% CI [-0.024, 0.017], p = .70).

Pain distress is therefore a full mediator in this model. In Models 3 and 5, with outcome variables of pain intensity and pain disability, no significant indirect effect was found.

Table 5.

Mediation analyses testing pain subscales as outcomes

Model	Path	Estimate	β	*SE*	95% CIs	*p*
Model 3 Childhood maltreatment → mental defeat → pain intensity	Indirect	0.008	0.09	0.004	0.002 – 0.017	.06
Childhood maltreatment → pain intensity	Direct	0.006	0.06	0.009	-0.011 – 0.023	.52
Model 4 Childhood maltreatment → mental defeat → pain distress	Indirect	0.015	0.13	0.007	0.003 – 0.031	.03
Childhood maltreatment → pain distress	Direct	-0.004	-0.03	0.010	-0.024 – 0.017	.70
Model 5 Childhood maltreatment → mental defeat → pain disability	Indirect	0.107	0.11	0.006	0.022 – 0.024	.05
Childhood maltreatment → pain disability	Direct	0.009	0.09	0.009	-0.009 – 0.026	.33

Post-hoc power analysis

A post-hoc power analysis was conducted using Monte Carlo Power Analysis (62). Detected standardised coefficients from the present study (table X) and variable standard deviations (table Y) were inputted into the simulation app. Replications were set to 1000 and Monte Carlo draws per rep were set to 20000. Sample size steps were set to 10. The analysis indicated that for the path *ab* to achieve power of .81, a sample of *n*=140 would be required. It also showed that for the path *a'b'* to achieve power of .8, a sample of *n*=270 would be needed.

Discussion

This study has examined whether mental defeat and somatic hypervigilance help to explain the relationship between the experience of childhood maltreatment and chronic pain severity in adulthood. It found that mental defeat does fully mediate between childhood maltreatment and pain severity. Somatic hypervigilance, however, was not a significant mediator. After pain severity was broken down into three aspects (intensity, distress, disability), mental defeat was found to mediate fully the relationship between childhood maltreatment and pain distress but did not explain childhood maltreatment's association with pain intensity or pain disability.

As far as the author is aware, this is the first study that has shown mental defeat to mediate the relationship between childhood maltreatment and chronic pain. Although the *p*-value fell only just below the significance level, this result is consistent with a growing body of research into the role of mental defeat in the experience of chronic pain (31,32,63,64). The finding that mental defeat mediates the relationship between childhood maltreatment and chronic pain also provides support to a claim central to the transdiagnostic PPS model: that key appraisals such as mental defeat lead to vicious cycles which maintain difficulties in functioning (23).

The finding that somatic hypervigilance does not mediate the relationship between childhood maltreatment and pain severity is notable. This initially seems to contradict theories which propose that heightened threat sensitivity influences the development of chronic pain in people with trauma backgrounds (43,65). The results of the correlation analysis show that, while somatic hypervigilance was strongly positively correlated with pain severity and other pain outcomes, there was no association between childhood maltreatment and somatic hypervigilance. This is certainly surprising, as there is an established body of research that shows increased responses to threat-related stimuli in both maltreated children and adults who report childhood maltreatment (66–68).

Understanding more about different types of childhood maltreatment experiences could shed light on this result. The present study did not analyse subtypes of childhood maltreatment. Some researchers have argued that the experience of abuse in childhood might be more closely associated with heightened sensitivity to threat, while neglect has more diffuse effects, particularly downregulating reward processing (43,69–71). In addition, to keep the time burden on participants manageable, this study did not capture data on the timing or chronicity of maltreatment. Previous research has suggested that heightened threat sensitivity is most strongly predicted by experience of adversity during either early infancy or post-puberty (72), and has identified chronicity of maltreatment as a particularly important factor in predicting threat reactivity (73). Without knowing more about the maltreatment experiences of the sample in the present study, we should be cautious about extrapolating the result to other groups.

This study found that mental defeat fully mediated the link between childhood maltreatment and pain distress. This finding provides evidence of a pathway linking childhood maltreatment with the previously established connection between mental defeat and pain distress (32–34). Although this study did not gather data on the comorbidity of

chronic pain with mental health conditions, one important factor here may be the strong association between mental defeat and low mood, depression, anxiety and suicidality, including among people with chronic pain (63,74–76). The finding that mental defeat did not mediate between childhood maltreatment and pain disability is contrary to previous research findings (33). However, as discussed below, it is possible that the sample size was not big enough to capture small effects.

Limitations

When applying a mediation model to cross-sectional data, it is not possible to draw conclusions regarding causation. While this study has shown that mental defeat is an indirect pathway in the relationship between childhood maltreatment and chronic pain, without longitudinal or experimental data we cannot state that it is a causal factor. Moreover, certain findings could have been influenced by the assumed effect sizes used to calculate the sample. For the model with somatic hypervigilance as a mediator, it is possible that a smaller effect was present but would only have been detectable with a larger sample. The post-hoc power analysis did indicate that the study did not have a large enough sample to be sufficiently powered, particularly in relation to the model with somatic hypervigilance as a mediator. According to the post-hoc calculation, 170 more participants would have been required to reach power of 0.8. This adds weight to the idea that the present finding that somatic hypervigilance did not mediate the relationship between childhood maltreatment and pain severity was influenced by an underpowered sample. However, it is important to interpret post-hoc power analyses with caution, as there is growing evidence that such calculations are theoretically incorrect and are skewed to inevitably conclude that studies are underpowered (77,78)

The sample in this study appears to be different from other research samples concerning mental defeat in chronic pain. The mean score in the present study was 64.6. This is almost double that identified in clinical chronic pain samples in other papers (31,63). This raises questions about the representativeness and, thus, generalisability of the results in this study. There could be several reasons for this observed difference in levels of mental defeat. The present study recruited from community samples, unlike the studies which found lower mental defeat scores. It is possible that those who do receive clinical care from secondary pain services – which can be hard to access due to high demand – are able to gain access to treatment in part due to stronger beliefs in their ability to benefit from treatment and higher motivation. It may then also be the case that through receiving care from pain management services, individuals feel a greater sense of agency, which may decrease the strength of 'mental defeat' beliefs.

A retrospective approach to measuring childhood maltreatment is always imperfect, relying on accurate recall and reporting of past events. However, the consensus among researchers remains that the degree of bias in retrospective reporting is insufficient to render the approach invalid (79,80). Alternative methods such as prospective measurement have different limitations: many cases of childhood maltreatment are never officially recorded (81). Repeated-measures studies have demonstrated that adults tend to provide stable self-reports of childhood maltreatment over time (82,83).

The recruitment method in this study represents both a limitation and strength. On the one hand, using an online questionnaire increases the risk of inaccurate self-report diagnoses. On the other hand, only a small minority of people with fibromyalgia access treatment in NHS pain management services (84). By broadening the recruitment approach beyond such services, this study sought to gather data from a more representative sample. Although the vast majority of the sample here identified as female, this may be representative of the study

population, given that between 2014 and 2018 it was estimated that 90.3% of new diagnoses of fibromyalgia in the UK were in women (85).

Implications

The finding that mental defeat is an indirect pathway through which childhood maltreatment and pain severity outcomes are related has implications for research, policy, and clinical practice. Future research might usefully extend the findings in this study in three main ways. First, studies could employ prospective and experimental methods to assess causality in the relationships between childhood maltreatment, chronic pain, and its mediators (for examples of the application of these approaches in similar research contexts, see 61,62,82). Second, researchers could gather a larger dataset to learn more about childhood maltreatment's relationship with subcomponents of pain severity. Third, the impact of different forms, timings, and chronicity of childhood maltreatment could be explored.

Existing studies on mental defeat in chronic pain have recommended that clinicians help patients to address the belief that they have been defeated in a battle against pain using a range of techniques, including established CBT- and ACT-based methods of cognitive restructuring and reframing (33). The present study supports these calls. The links established here between childhood maltreatment, mental defeat and chronic pain underline the value of longitudinal approaches to formulation and treatment. Given that survivors of childhood maltreatment and people experiencing chronic pain often blame themselves for their suffering (87–90), it could be productive to incorporate elements of compassion-focused therapy, which would provide tools for patients to hold more compassion for their younger selves and to soothe themselves in future (91,92). The treatment approaches suggested here should be assessed in future through case studies or randomised-control trials.

Preventing childhood maltreatment is a public health imperative with strong moral and economic rationales (93–95). Chronic pain not only has potentially severe consequences

for those living with it, but also presents broader economic challenges as a result of lost productivity in the workforce and the cost of health and social care (84,96). While the present findings raise the possibility that the pathway from childhood adversity to chronic pain in fibromyalgia could be disrupted by therapeutically targeting mental defeat, they also point towards the value of dedicating more resource to the prevention of child maltreatment. If causality in this pathway can be established through longitudinal research, the case will be even stronger. If fewer people are exposed to situations in childhood for which mental defeat is learned as an adaptive survival strategy, more may find it easier to cope when faced with pain and other challenges in later life.

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Connecting Narrative

Childhood adversity

At the core of this thesis is a concern to learn more about childhood adversity and its multifaceted long-term effects. This interest stems from a formative experience earlier in my career working as a Policy and Public Affairs Assistant at the NSPCC, one of the UK's leading child protection charities. It was in this role that I first learnt about how the burgeoning body of research using ACE questionnaires was creating a powerful body of evidence that demonstrated the psychological, physical health, social, and economic impacts of childhood adversity. My commitment to this research area is also grounded in my own personal and family experiences.

While the SIP examines ill health (and chronic pain in particular) as a form of childhood adversity, the SRL and TDRP focus more on abuse and neglect. In the latter projects, I was especially interested in understanding the possible psychological mechanisms that might help us to understand *why* childhood maltreatment increases the likelihood of an individual experiencing mental and physical health conditions in adulthood. Insights from cognitive-behavioural frameworks, attachment theory, and the theory of latent vulnerability seemed to me especially helpful for attempting to answer this question. Ultimately, I hope that this research not only strengthens the case for devoting resources to preventing childhood adversity and maltreatment (as I know from my experience at the NSPCC, high-quality evidence is fundamental to effective and progressive policymaking), but also contribute to the development of new or improved psychological therapies leading to better outcomes for patients who have had a challenging start in life.

Physical healthcare and the psychology of pain

The second central theme of this thesis concerns how patients and families engage with physical healthcare, especially as regards the perinatal period and chronic pain. This interest stems from my clinical work, especially my placements in a Perinatal Mental Health Service, a Paediatric Chronic Pain Service, and a Major Trauma Centre. The SRL focused on the transition to parenthood, a period defined for many families by a marked increase in contact with healthcare professionals. The SIP took forward the question of how families relate to healthcare services by interviewing mothers of young people who had received treatment from a chronic pain service. This project aimed to support the service to develop an intervention targeting the parents of young people on its waiting list. It also enabled me to pursue a more specific interest relating to the psychology of pain. That interest was developed more fully in my TDRP, which explored the role of particular thinking styles as potential mediators in the association between childhood adversity and chronic pain in adulthood.

Gender

Because of the projects' shared concerns with childhood experiences, family life, and chronic pain, gender was an important theme throughout. The SRL explored research on the mental health of fathers, and investigated the generalisability of findings relating to mothers. Although neither of the other projects specified gender in its recruitment criteria, nearly all of the participants were women. For the SIP, this was because mothers were usually more involved in organising and attending their child's healthcare appointments with the service (partly because families had often arranged their working patterns in such a way that it was easier for mothers to take time off during weekdays). For the TDRP, the fact that the majority

of participants were female corresponded to a general disparity between men and women in diagnoses of fibromyalgia. Taken as a whole, the thesis underscores the profound ways in which the cultural and social construction of gender shapes our everyday lives, and, in the face of this complexity, the need for researchers to be very cautious about making claims about innate or biological differences between men and women.

Sensitive topics

Partly because of their emphasis on childhood adversity and gender, all three projects touched on very sensitive issues, requiring me to think carefully about how people's experiences were described and how participants were treated. In the SRL, one notable concern in this respect was how fatherhood is defined. This is a complex and fraught question, deeply embedded in wider cultural, social, and political issues. To me, this made it all the more surprising that the studies reviewed did not provide more detailed explanations of how they had chosen who counts as a 'father'. In the case of chronic pain (SIP, TDRP), psychological studies can be controversial, as there is a risk of being seen to endorse a view that the pain is entirely psychosomatic or somehow 'not real'. Especially given how women (who, as noted above, are far more likely to be diagnosed with fibromyalgia) have often been let down by medical researchers and professionals, I was conscious of the need to frame the TDRP very carefully to avoid alienating potential participants.

When I advertised the questionnaire for my TDRP in social media support groups for people with fibromyalgia, I was initially nervous about how members of those groups might respond to the emphasis on early life experiences and thinking patterns (rather than medical causes). In the end, though, I was taken aback by the positivity and generosity of these online communities. People were so willing to take part in the study (and to share it with their friends) that I was able to complete data collection in just a few days. I am deeply grateful to

all those who completed the questionnaire, as well as to the mothers interviewed for my SIP. Both projects have bolstered my confidence that I do have the skills required to undertake research on sensitive topics. They have also taught me about the strong desire of many people with misunderstood or understudied conditions (and their relatives) to take part in research and their inspiring commitment to helping other patients and families in future. I can only hope that I have done justice to that commitment within this thesis and will continue to do so in my research and clinical practice throughout the rest of my career.

Executive summary

Why did we do this study?

Fibromyalgia is a syndrome as part of which people can experience chronic (long-term) pain. People who experienced abuse or neglect in their childhood are more likely to live with fibromyalgia and chronic pain as adults. They are also more likely to describe their chronic pain as being more intense and feel more distressed by it. Some researchers have suggested that this is because the experience of childhood abuse or neglect can influence the way a person thinks and responds to threat. Certain thinking patterns are more common among people living with chronic pain, including 'mental defeat' (when a person does not view themselves as a human being who can cope with threat) and 'somatic hypervigilance' (when a person pays extra attention to the sensations in their body which feel threatening). This study wanted to find out whether either of these thinking patterns play a role in the relationship between child abuse or neglect and chronic pain.

What did we do?

We asked adults with a diagnosis of fibromyalgia to fill in a survey online, which included questions to find out:

- if they had experienced different types of child abuse and neglect;
- how defeated they felt by their pain;
- how much they paid attention to sensations of pain;
- how intense they would describe their pain, how distressed they felt by their pain, and how much their pain stopped them from doing activities.

What did we find?

We found that 'mental defeat' did play a role in the relationship between childhood abuse or neglect and adult chronic pain severity. More specifically, 'mental defeat' was a significant mediator, meaning that it formed an indirect pathway which helped to explain the link between the two. However, 'somatic hypervigilance' was not a mediator, meaning it did not help to explain the relationship between child abuse or neglect and adult chronic pain severity.

What does this mean?

Now that we have learned that mental defeat plays a role in the relationship between child abuse or neglect and adult chronic pain, we can recommend treatment approaches for therapists in chronic pain services who are working with adults with histories of child abuse or neglect. It could be useful, for example, for therapists to explore with people whether 'mental defeat' was a strategy they developed in childhood which helped them to survive abusive or neglectful environments, and whether this strategy is still beneficial in the context of chronic pain. Therapists could also help people to identify current thoughts and beliefs relating to 'mental defeat', and to develop confidence in their abilities to cope with chronic pain.

We want to see researchers in future develop these findings by testing whether 'mental defeat' has a particularly strong effect on the relationships between child abuse or neglect and different parts of the pain experience (such as pain intensity, pain-related distress, and pain-related disability). They should also explore whether different types of child abuse or neglect have different influences on thinking styles which can make the experience of chronic pain worse.

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There are many other people to whom I owe a great deal. Jess, I want to thank you for your hard work being my co-rater for the Systematic Review of the Literature. It has been a real pleasure to navigate this process with you. Tiago, I cannot thank you enough for the support and encouragement you have given me across many aspects of the research process.

To my dear family and friends, who have cheered me on for so many years, I can't thank you enough. And to Giles: without you I would not be at this stage. I owe you more gratitude than I can express.

Appendices

Appendix 1.1: SRL Journal Submission Guide

Reviews: Authors with plans for proposed review articles (systematic, meta-analytic, scoping) are invited to first submit a draft outline to the EiC for review. Please visit our Support Center to send your enquiries. The editors may also commission reviews on specific topics. Reviews submitted without invitation or prior approval may be returned.

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Inclusive language acknowledges diversity, conveys respect to all people, is sensitive to differences, and promotes equal opportunities. Content should make no assumptions about the beliefs or commitments of any reader; contain nothing which might imply that one individual is superior to another on the grounds of age, gender, race, ethnicity, culture, sexual orientation, disability or health condition; and use inclusive language throughout. Authors should ensure that writing is free from bias, stereotypes, slang, reference to dominant culture and/or cultural assumptions. We advise to seek gender neutrality by using plural nouns ("clinicians, patients/clients") as default/wherever possible to avoid using "he, she," or

"he/she." We recommend avoiding the use of descriptors that refer to personal attributes such as age, gender, race, ethnicity, culture, sexual orientation, disability or health condition unless they are relevant and valid. When coding terminology is used, we recommend to avoid offensive or exclusionary terms such as "master", "slave", "blacklist" and "whitelist". We suggest using alternatives that are more appropriate and (self-) explanatory such as "primary", "secondary", "blocklist" and "allowlist". These guidelines are meant as a point of reference to help identify appropriate language but are by no means exhaustive or definitive.

Reporting sex- and gender-based analyses

Reporting guidance

For research involving or pertaining to humans, animals or eukaryotic cells, investigators should integrate sex and gender-based analyses (SGBA) into their research design according to funder/sponsor requirements and best practices within a field. Authors should address the sex and/or gender dimensions of their research in their article. In cases where they cannot, they should discuss this as a limitation to their research's generalizability. Importantly, authors should explicitly state what definitions of sex and/or gender they are applying to enhance the precision, rigor and reproducibility of their research and to avoid ambiguity or conflation of terms and the constructs to which they refer (see Definitions section below). Authors can refer to the Sex and Gender Equity in Research (SAGER) guidelines and the SAGER guidelines checklist. These offer systematic approaches to the use and editorial review of sex and gender information in study design, data analysis, outcome reporting and research interpretation - however, please note there is no single, universally agreed-upon set of guidelines for defining sex and gender.

Definitions

Sex generally refers to a set of biological attributes that are associated with physical and physiological features (e.g., chromosomal genotype, hormonal levels, internal and external anatomy). A binary sex categorization (male/female) is usually designated at birth (""sex assigned at birth""), most often based solely on the visible external anatomy of a newborn. Gender generally refers to socially constructed roles, behaviors, and identities of women, men and gender-diverse people that occur in a historical and cultural context and may vary across societies and over time. Gender influences how people view themselves and each other, how they behave and interact and how power is distributed in society. Sex and gender are often incorrectly portrayed as binary (female/male or woman/man) and unchanging whereas these constructs actually exist along a spectrum and include additional sex categorizations and gender identities such as people who are intersex/have differences of sex development (DSD) or identify as non-binary. Moreover, the terms ""sex"" and ""gender"" can be ambiguous—thus it is important for authors to define the manner in which they are used. In addition to this definition guidance and the SAGER guidelines, the resources on this page offer further insight around sex and gender in research studies.

Author contributions

For transparency, we require corresponding authors to provide co-author contributions to the manuscript using the relevant CRediT roles. The CRediT taxonomy includes 14 different roles describing each contributor’s specific contribution to the scholarly output. The roles are: Conceptualization; Data curation; Formal analysis; Funding acquisition; Investigation; Methodology; Project administration; Resources; Software; Supervision; Validation; Visualization; Roles/Writing - original draft; and Writing - review & editing. Note that not all roles may apply to every manuscript, and authors may have contributed through multiple roles. More details and an example.

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Full-length manuscripts should not exceed 35 pages total (including abstract, text, references, tables, and figures), double spaced with margins of at least 1 inch on all sides and a standard font (e.g., Times New Roman) of 12 points (no smaller).

Article structure

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Divide your article into clearly defined sections. Three levels of headings are permitted. Level one and level two headings should appear on its own separate line; level three headings should include punctuation and run in with the first line of the paragraph.

Introduction
State the objectives of the work and provide an adequate background, avoiding a detailed literature survey or a summary of the results.

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Highlights are optional yet highly encouraged for this journal, as they increase the discoverability of your article via search engines. They consist of a short collection of bullet points that capture the novel results of your research as well as new methods that were used during the study (if any). Please have a look at the example Highlights.

Highlights should be submitted in a separate editable file in the online submission system. Please use 'Highlights' in the file name and include 3 to 5 bullet points (maximum 85 characters, including spaces, per bullet point).

Abstract
Abstracts should follow a structured format of no more than 250 words including the following sections: Background, Objective, Participants and Setting, Methods, Results (giving specific effect sizes and their statistical significance), and Conclusions.

Please note: The Discussion type article requires an unstructured abstract that clearly outlines to issue or gap, the discussion approach, key messages and implications. It follows the same word length.

Keywords
Immediately after the abstract, provide a maximum of 6 keywords, using American spelling and avoiding general and plural terms and multiple concepts (avoid, for example, 'and', 'of'). Be sparing with abbreviations: only abbreviations firmly established in the field may be eligible. These keywords will be used for indexing purposes.
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List funding sources in this standard way to facilitate compliance to funder's requirements:

Funding: This work was supported by the National Institutes of Health [grant numbers xxxx, yyyy]; the Bill & Melinda Gates Foundation, Seattle, WA [grant number zzzz]; and the United States Institutes of Peace [grant number aaaa].

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Please submit tables as editable text and not as images. Tables can be placed either next to the relevant text in the article, or on separate page(s) at the end. Number tables consecutively in accordance with their appearance in the text and place any table notes below the table body. Be sparing in the use of tables and ensure that the data presented in them do not duplicate results described elsewhere in the article. Please avoid using vertical rules and shading in table cells.

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Please ensure that every reference cited in the text is also present in the reference list (and vice versa). Any references cited in the abstract must be given in full. Unpublished results and personal communications are not recommended in the reference list, but may be mentioned in the text. If these references are included in the reference list they should follow the standard reference style of the journal and should include a substitution of the publication date with either 'Unpublished results' or 'Personal communication'. Citation of a reference as 'in press' implies that the item has been accepted for publication.

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[dataset] Oguro, M., Imahiro, S., Saito, S., Nakashizuka, T. (2015). Mortality data for Japanese oak wilt disease and surrounding forest compositions. Mendeley Data, v1. http://dx.doi.org/10.17632/xwj98nb39r.1.
Examples:
Reference to a journal publication:
Van der Geer, J., Hanraads, J. A. J., & Lupton, R. A. (2010). The art of writing a scientific article. *Journal of Scientific Communications, 163*, 51–59.
Reference to a book:
Strunk, W., Jr., & White, E. B. (2000). *The elements of style.* (4th ed.). New York, NY: Longman.
Reference to a chapter in an edited book:
Mettam, G. R., & Adams, L. B. (2009). How to prepare an electronic version of your article. In B. S. Jones, & R. Z. Smith (Eds.), *Introduction to the electronic age* (pp. 281–304). New York, NY: E-Publishing.

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Appendix 1.2: Search terms

father* OR “parent* father*1” OR patern*

AND

postnatal OR antenatal OR perinatal OR postpartum OR “expect*3 fathers” OR “expect*3 parent$1” OR childbirth

AND

“adverse childhood experiences” OR “child* adversity” OR “child* maltreatment” OR “child* abuse” OR “child* trauma” OR neglect OR violence OR “domestic abuse” OR “domestic violence”

AND

“mental health” OR depress* OR “depressive symptoms” OR anxi*3 OR “mental illness” OR “psychological distress” OR “psychiatric symptoms” OR distress OR stress

Appendix 2.1: SIP Journal Submission Guide

Journal of Pediatric Psychology: Instructions to Authors

Original Research

Original Research is the most common type of journal manuscript used to publish full reports of data from original research. Authors are also encouraged to visit the Equator Network for additional information on transparent reporting of all manuscript types.

See the following articles for detailed guidance concerning preparation of manuscripts:

- Editorial: Thoughts in Improving the Quality of Manuscripts Submitted to the *Journal of Pediatric Psychology*: How to Write a Convincing Introduction;
- Editorial: How to Report Methods in the *Journal of Pediatric Psychology*;
- Editorial: How to Write an Effective Results and Discussion Section for the *Journal of Pediatric Psychology*.

1. *Cohort and observational studies*. We welcome submission of the STROBE checklist; however, these are not required.
2. *Clinical Trials*
    - a. *Randomized controlled trials*: *JPP* is committed to enhancing the transparent reporting of all intervention studies. Please use the CONSORT checklist.
    - i. All Randomized Controlled Trials (RCTs) must be registered at or before the time of first patient enrollment in any primary registry of the WHO International Clinical Trials Registry Platform (ICTRP) or in ClinicalTrials.gov. Provide the registry name and registry number in the cover letter and methods section.
    - ii. If you are submitting a secondary data analysis from an RCT, please clearly indicate that it is a secondary data analysis in your manuscript and refer readers to the primary publication of outcomes. Consult with the editorial office if there are questions about reporting.
    - b. *Pilot and feasibility trials*: Feasibility studies investigate whether something can be done and if/how it should proceed with further testing, while pilot studies test some aspect(s) of a future trial on a smaller scale. For pilot feasibility trials, we encourage authors to refer to our 2021 Editorial (Hilliard et al. 2021), which provides guidance on the reporting of pilot feasibility trials. Please use the CONSORT extension checklist.
    - c. *Non-randomized trials*. A non-randomized clinical trial involves participants who are not assigned to different treatment groups by chance.
3. *Single Subject Studies*: As a journal that encourages submission of intervention studies, the Journal does accept, and encourages submission of, well-conducted single subject studies (N-of-1 designs). It is important to note that rigorous single subject designs are considered logical equivalents of Randomized Controlled Trials and include control conditions that support conclusions of causality. Previously published examples can be found in this journal including: Bernard, Cohen, & Moffett (2009). Authors considering submissions of case reports adopting N-of-1 methodology should

consult the following sources within this journal: Cohen, Feinstein, Masuda, & Vowles (2014); Cushing, Walters, & Hoffman (2014); Rapoff & Stark (2008).

References:

- Bernard, R. S., Cohen, L. L., & Moffett, K. (2009). A token economy for exercise adherence in pediatric cystic fibrosis: A single-subject analysis. Journal of Pediatric Psychology, 34, 354-365.
- Cohen, L. L., Feinstein, A., Masuda, A., & Vowles, K. E. (2014). Single-case research design in pediatric psychology: Considerations regarding data analysis. Journal of Pediatric Psychology, 39, 124-137.
- Cushing, C. C., Walters, R. W., & Hoffman, L. (2014). Aggregated N-of-1 randomized controlled trials: Modern data analytics applied to a clinically valid method of intervention effectiveness. Journal of Pediatric Psychology, 39, 138-150.
- Rapoff, M., & Stark, L. (2008). Editorial: Journal of Pediatric Psychology statement of purpose: Section on single-subject studies. Journal of Pediatric Psychology, 33, 16-21.

Reporting Guidelines

JPP requires that the relevant reporting guidelines be used for the following studies:

- Randomized trials: CONSORT
- Pilot and feasibility trials: CONSORT extension
- Non-randomized trials: TREND
- Scoping reviews: PRISMA-ScR
- Systematic reviews: PRISMA

Editable checklists for reporting guidelines may be found on the EQUATOR network site.

All intervention studies (RCTs and non-randomized trials) will undergo an additional review for transparent reporting conducted by the *JPP* Assistant Editor for Transparent Reporting. Review comments will be provided on the corresponding checklist. Authors will be required to address any identified reporting issues prior to publication.

Please clearly indicate the page numbers where each checklist item is reported in the manuscript. Please upload this checklist as supplementary material when you submit your manuscript for consideration. If a component of a checklist was not included in the manuscript, an explanation of the rationale for exclusion should be provided. Adherence to these reporting requirements provides standardization, ensures that important information has been included, and facilitates the peer review process.

We publish the final version of all required checklists as supplementary material. Thus, a final version of your CONSORT/TREND/PRISMA checklist will be requested as supplementary material prior to final acceptance of your manuscript. Please note the checklist should be reference in the methods section of your manuscript.

The *Journal of Pediatric Psychology* offers authors high-quality online publication. To ensure rapid and efficient publication, please follow the instructions below.

Type of Manuscript	Length Limit (Text, exclusive of title page, abstract, figures/tables, and references)	Total Number Figures/Tables	Maximum Number of references
Original	5,000 words (20 pages)	5	50

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The American Psychological Association Publication Manual (7th edition) should be used to guide manuscript formatting, with the exception of the title page and abstract as noted below.

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In addition to the APA Manual, the academic degrees of authors should be placed on the title page following their names.

Abstract

A structured double-spaced abstract of not more than 250 words should be included. The abstract should include the following parts:

- a. Objective (brief statement of the purpose of the study)
- b. Methods (summary of the participants, design, measures, procedure)
- c. Results (the primary findings of this work)
- d. Conclusions (statement of implications of these data)

Body of the Manuscript

- a. *Introduction*

- b. *Methods* - Informed consent and ethical treatment of study participants: Authors should indicate in the Method section of relevant manuscripts how informed consent was obtained and report the approval of the study by the appropriate Institutional Review Board(s).
- c. *Results*
- d. *Discussion* - Clinical relevance of the research should be incorporated into the manuscripts. There is no special section on clinical implications, but authors should integrate implications for practice, as appropriate, into papers.

Acknowledgements

Add appropriate acknowledgements, including information on the funding sources as noted below:

Funding

Details of all funding sources for the work in question should be given in a separate section entitled "Funding." The following rules should be followed:

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- The full official funding agency name should be given, i.e. "the National Cancer Institute at the National Institutes of Health" or simply "National Institutes of Health," not "NCI" or "NCI at NIH" (full RIN-approved list of UK funding agencies)
- Grant numbers should be complete and accurate and provided in parentheses as follows: "(grant number xxxx)."Multiple grant numbers should be separated by a comma as follows: "(grant numbers xxxx, yyyy)"
- Agencies should be separated by a semi-colon (plus 'and' before the last funding agency)
- Where individuals need to be specified for certain sources of funding the following text should be added after the relevant agency or grant number "to [author initials]."

Oxford Journals will deposit all NIH-funded articles in PubMed Central. See the Complying with funder policies page for details. Authors must ensure that manuscripts are clearly indicated as NIH-funded using the guidelines above.

Tables and Figures
Tables

Tables should be included as separate pages using acceptable formats (e.g., .doc files).

Figures

Figure resolution should be no less than 300 dpi for halftone color (photo) images, 600 dpi for combination halftones, and 1200 dpi for line art. Most standard figure formats are acceptable, such as .jpg, .gif, .tif, or .eps format. Please follow this link for useful information on preparing your figures for publication.

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Diversity, Equity, and Inclusion Considerations

The Journal of Pediatric Psychology (JPP) and Clinical Practice in Pediatric Psychology (CPPP) both identified enhancing reporting practices for diversity, equity, and inclusion (DEI) in pediatric psychology as a top priority (Duncan, 2023; Modi, 2023). Building upon a guidance for reporting on race and ethnicity in JPP articles (Palermo et al., 2021), we recently published an editorial focused on recommendations on inclusive language and transparent reporting relating to diversity dimensions. Our current efforts strive to address a broader set of diversity dimensions, using the ADDRESSING Framework (Hays, 2016) as guidance, with the goal of enhancing the rigor and inclusiveness of pediatric psychology science. Several important existing checklists and guidelines on inclusive language and transparent reporting relating to DEI exist (American Psychological Association, 2023b; Buchanan et al., 2021; Letzen et al., 2022; Matsui et al., 2020; Miller et al., 2019; Williford, Sweenie, et al., 2023). However, no comprehensive guidelines were available that captured the specific context of pediatric psychology (e.g., developmental/family considerations), while also being broadly applicable across the field (e.g., not focused on a specific condition or symptom).

Acknowledging that this is a rapidly evolving area of science, the updated guidelines represent a living document that will exist online within the Instructions for Authors of both journals, which will be updated yearly. Please find the first iteration as a guidance to implement optimal DEI reporting practices (See Table 1), as well as examples of how these apply to the manuscript types published in our journals (see Table 2).

Data Availability Statements

The inclusion of a data availability statement is a requirement for papers published in *JPP*. Data availability statements provide a standardized format for readers to understand the availability of original and third-party data underlying the research results described in the paper. The statement should describe and provide means of access, where possible, by linking to the data or providing the required unique identifier.

Please use one of the following data availability statements within the Methods section of your manuscript.

Availability of data	**Sample statement**
Data are available in a repository and can be accessed via a DOI link.	*The data underlying this article are available in* [repository name, e.g. the Dryad Digital Repository], at https://dx.doi.org/[doi]
Data are available in a repository and can be accessed using a unique identifier other than a DOI.	*The data underlying this article are available in* [repository name, e.g. the GenBank Nucleotide Database] at [URL], and can be accessed with [unique identifier, e.g. accession number, deposition number].
All data are incorporated into the article and its online supplementary material.	*The data underlying this article are available in the article and in its online supplementary material.*
Data cannot be shared for	*The data underlying this article cannot be shared publicly due to* [describe why the data cannot be shared, e.g. for the privacy of

Availability of data	Sample statement
ethical/privacy reasons.	individuals that participated in the study]. *The data will be shared on reasonable request to the corresponding author.*
Data available on request.	Data available on request.
Data is owned by a third party.	*The data underlying this article were provided by* [third party] *under licence / by permission. Data will be shared on request to the corresponding author with permission of* [third party].
Data generated at a large-scale facility.	*The data underlying this article were accessed from* [name of large-scale facility, include URL and unique identifier for dataset, if available]. *The derived data generated in this research will be shared on reasonable request to the corresponding author.*
Data derived from a source in the public domain.	*The data underlying this article are available in* [repository name, e.g. Zenodo], at https://dx.doi.org/[doi]. *The datasets were derived from sources in the public domain:* [list sources, including URLs].
Data are subject to an embargo.	*The data underlying this article are subject to an embargo of* [period of embargo, e.g. 12 months from the publication date of the article]. *Once the embargo expires the data will be available* [give details of availability, e.g. in a repository plus embargoed link; upon reasonable request, etc.].
There are no new data associated with this article.	*No new data were generated or analyzed in support of this research.*

The Journal uses the contributor roles taxonomy (CRediT), which allows authors to describe the contributor roles in a standardized, transparent, and accurate way. Authors should choose from the contributor roles outlined on the CRediT website and supply this information upon submission.

These include the following 14 roles: Conceptualization, Data curation, Formal Analysis, Funding Acquisition, Investigation, Methodology, Project Administration, Resources, Software, Supervision, Validation, Visualization, Writing-Original draft, Write-Review and Editing.

You may choose multiple contributor roles per author. Individual contributors can be assigned multiple roles and a given role can assigned to multiple contributor. Where multiple individuals serve in the same role, the degree of contribution should be specified as ‘lead,’ ‘equal,’ or ‘supporting.’

Corresponding authors should assume responsibility for role assignment, and all contributors should be given the opportunity to review and confirm assigned roles prior to submission. Any other individuals who do not meet authorship criteria and made less substantive contributions should be listed in your manuscript as non-author contributors with their contributions clearly described. Following manuscript submission, any changes to contributor roles require the approval of the editor.

Appendix 2.2: Interview framework

- What needs do you think you had relating to [YP]'s chronic pain when they started treatment at OXCYPP?
- Were there any aspects of the intensive rehabilitation programme that you found helpful?
- Were there any aspects of the intensive rehabilitation programme that you found unhelpful?
- Is there anything you learned in the intensive programme that you would have liked to know at an earlier point in [YP]'s treatment with OXCYPP?
- Are there any skills that you learned at the intensive programme that you found particularly valuable or would have liked to have learned earlier in [YP]'s treatment with OXCYPP?

Appendix 2.3: Reflection on researcher position

A foundational aspect of RTA is for the researcher to reflect on their own positionality (Braun & Clarke, 2021b). For RPD, her preconceptions about what might be salient to parents of children with chronic pain were most obvious at moments when she was surprised during the interviews at what topics the participants seemed most eager to discuss. RPD's assumptions were likely shaped by her experience of working as a trainee clinician in OXCYPP six months before conducting the interviews. In addition, her own disciplinary lens (clinical psychology) made it difficult not to give extra weight to the psychological needs of patients (rather than the more practical issues that felt urgent to them). Finally, as she had already conducted the literature search, RPD's awareness of the evidence base for treatment of paediatric chronic pain shaped her assumptions about what would emerge in the interviews. It is also important to note that RPD did not have children or experience of parenting when she conducted the interviews and analysed the data. This will have had an impact on the way she related to the parents in interviews and made sense of the data.

RPD was clear with participants that she had previously worked as a trainee clinical psychologist with the team and this knowledge may well have affected how they related to her. She had the impression that participants who were more concerned with feeding back positive experiences positioned her as an existing member of the team about which they felt warmly. On the other hand, participants who had had more negative experiences seemed to view her as a neutral outsider whom they could confide in without offending. Precisely because of its ambiguity, RPD's liminal position in relation to the team may have been a strength, as participants felt able to relate to her in different ways. Nevertheless, the interviews would likely have been quite different if conducted by either a current member of the team or a completely independent researcher.

Appendix 2.4: Service response to Improvement Project

The project was presented to the Service Lead (Dr Konrad Jacobs) in written format. He gave verbal feedback during a consequent meeting. Konrad said that the project was the most helpful piece of work about the service that he had seen, and that he planned to implement many of the changes recommended. Some of these, he said, could be achieved very quickly, such as introducing clear information leaflets relating to each type of intervention that families could receive. He stated that the current Assistant Psychologist in the service would be well placed to begin developing these. Others, he noted, would take longer to implement. This includes the parent intervention itself, which the service would start to establish once the original supervisor of this project returns from maternity leave.

We agreed that some of the wishes stated by participants would be more difficult to address, in particular the request for some kind of peer support infrastructure. Such a project would raise questions around how to ensure that contacts between parents would be appropriate and prevent bullying or harassment. It would also be important to make sure that misinformation wasn't being shared with parents joining the service.

Appendix 3.1: TDRP Journal Submission Guide

The Clinical Journal of Pain: Instructions for Authors

The Clinical Journal of Pain publishes original articles in the following forms: *Clinical investigations:* Present results of original clinical research. *Case reports:* Case reports will no longer be accepted for publication in *Clinical Journal of Pain* and thus no submission for case reports will be accepted as of June 13, 2013. *Reviews:* Comprehensive surveys covering a broad area. They consolidate old ideas and may suggest new ones. They must provide a critique of the literature. *Special articles:* On subjects not easily classified above (e.g., articles on history, education, demography, ethics, socioeconomics, etc.). *Letters to the editor:* These may offer criticism of published material, but must be objective, constructive, and educational. A few references, a small table, or relevant illustrations may be used.

Ethical/Legal Considerations: A submitted manuscript must be an original contribution not previously published (except as an abstract or preliminary report), must not be under consideration for publication elsewhere, and, if accepted, must not be published elsewhere in similar form, in any language, without the consent of Lippincott Williams & Wilkins. Each person listed as an author is expected to have participated in the study to a significant extent. Although the editors and referees make every effort to ensure the validity of published manuscripts, the final responsibility rests with the authors, not with the Journal, its editors, or the publisher. All manuscripts must be submitted on-line through the journal's Web site at http://cjp.edmgr.com. See submission instructions under "On-line manuscript submission."

Patient anonymity and informed consent: It is the author's responsibility to ensure that a patient's anonymity be carefully protected and to verify that any experimental investigation with human subjects reported in the manuscript was performed with informed consent and following all the guidelines for experimental investigation with human subjects required by the institution(s) with which all the authors are affiliated. Authors should mask patients' eyes and remove patients' names from figures unless they obtain written consent from the patients and submit written consent with the manuscript.

Conflicts of interest: Authors must state all possible conflicts of interest in the manuscript, including financial, consultant, institutional and other relationships that might lead to bias or a conflict of interest. If there is no conflict of interest, this should also be explicitly stated as none declared. All sources of funding should be acknowledged in the manuscript. All relevant conflicts of interest and sources of funding should be included on the title page of the manuscript with the heading “Conflicts of Interest and Source of Funding:”. For example:

Conflicts of Interest and Source of Funding: A has received honoraria from Company Z. B is currently receiving a grant (#12345) from Organization Y, and is on the speaker’s bureau for Organization X – the CME organizers for Company A. For the remaining authors none were declared.

Copyright: In addition, each author must complete and submit the journal's copyright transfer agreement, which includes a section on the disclosure of potential conflicts of interest based on the recommendations of the International Committee of Medical Journal Editors, "Uniform Requirements for Manuscripts Submitted to Biomedical Journals" (www.icmje.org/update.html).

A copy of the form is made available to the submitting author within the Editorial Manager submission process. Co-authors will automatically receive an Email with instructions on completing the form upon submission.

Compliance with NIH and Other Research Funding Agency Accessibility Requirements
A number of research funding agencies now require or request authors to submit the post-print (the article after peer review and acceptance but not the final published article) to a repository that is accessible online by all without charge. As a service to our authors, LWW will identify to the National Library of Medicine (NLM) articles that require deposit and will transmit the post-print of an article based on research funded in whole or in part by the National Institutes of Health, Wellcome Trust, Howard Hughes Medical Institute, or other funding agencies to PubMed Central. The Copyright Transfer Agreement provides the mechanism.

Permissions: Authors must submit written permission from the copyright owner (usually the publisher) to use direct quotations, tables, or illustrations that have appeared in copyrighted form elsewhere, along with complete details about the source. Any permissions fees that might be required by the copyright owner are the responsibility of the authors requesting use of the borrowed material, not the responsibility of Lippincott Williams & Wilkins.

MANUSCRIPT SUBMISSION

On-line manuscript submission:All manuscripts must be submitted on-line through the Web site: **http://cjp.edmgr.com**. **First-time users:** Please click the Register button from the menu and enter the requested information. On successful registration, you will be sent an e-mail indicating your user name and password. Print a copy of this information for future reference. *Note:* If you have received an e-mail from us with an assigned user ID and password, or if you are a repeat user, do not register again. Just log in. Once you have an assigned ID and password, you do not have to re-register, even if your status changes (that is, author, reviewer, or editor). You can change your username/password at any time by clicking "Update My Information" at the top of any page in Editorial Manager. **Authors:** Please click the log-in button from the menu at the top of the page and log into the system as an Author. Submit your manuscript according to the author instructions. You will be able to track the progress of your manuscript through the system. If you experience any problems, please contact the Managing Editor, Leslie Broberg: leslie.broberg@wolterskluwer.com.

Preparation of Manuscript

Cover Letter. With your manuscript, please submit a brief cover letter describing your manuscript and provide the names and e-mail addresses of 3-4 suggested reviewers. These should be people who are knowledgeable of the topic of the manuscript and who will not have a conflict of interest serving as reviewers. The Editors may or may not enlist these suggested reviewers.

Manuscripts that do not adhere to the following instructions will be returned to the corresponding author for technical revision before undergoing peer review.

General format: Submit manuscripts in English as a Word file. Double space all copy, including legends, footnotes, tables, and references.

Title page: Include on the title page (a) complete manuscript title; (b) authors' full names, highest academic degrees, and affiliations; (c) name and address for correspondence, including fax number, telephone number, and e-mail address; (d) address for reprints if different from that of corresponding author; and (e) sources of support that require acknowledgment.

The title page must also include disclosure of funding received for this work from any of the following organizations: National Institutes of Health (NIH); Wellcome Trust; Howard Hughes Medical Institute (HHMI); and other(s).

Structured abstract and key words: Limit the abstract to 250 words. Do not cite references in the abstract. Limit the use of abbreviations and acronyms. Use the following subheads: Objectives, Methods, Results, and Discussion. List three to five key words.

Text: Organize the manuscript into four main headings: Introduction, Materials and Methods, Results, and Discussion. Define abbreviations at first mention in text and in each table and figure. If a brand name is cited, supply the manufacturer's name and address (city and state/country). Acknowledge all forms of support, including pharmaceutical and industry support, in an Acknowledgments paragraph.

The Clinical Journal of Pain does not have a required number of words for the text. Please treat your subject thoroughly but not excessively. Perusing several back issues to familiarize yourself with typical accepted article length is recommended.

Abbreviations: For a list of standard abbreviations, consult the *Council of Biology Editors Style Guide* (available from the Council of Science Editors, 9650 Rockville Pike, Bethesda, MD 20814) or other standard sources. Write out the full term for each abbreviation at its first use unless it is a standard unit of measure.

References: The authors are responsible for the accuracy of the references. References should be cited by number in order of citation in the text. Key the references (double-spaced) at the end of the manuscript, in numbered order. Cite unpublished data, such as papers submitted but not yet accepted for publication or personal communications, in parentheses in the text (H. E. Marman, M.D., unpublished data, February, 1997). If there are more than three authors, name only the first three authors and then use et al. Refer to the *List of Journals Indexed in Index Medicus* for abbreviations of journal names, or access the list at http://www.nlm.nih.gov/tsd/serials/lji.html. Citations throughout the article and in all tables and figures should include only the reference number rather than the year of publication. Sample references are given below:

Journal article
1. Prager J, Jacobs M, Johnson KJ. Evaluation of patients for implantable pain modalities: medical and behavioral assessment. *Clin J Pain* 2001;17:206-214.

Book chapter
2. Todd VR. Visual information analysis: frame of reference for visual perception. In: Kramer P, Hinojosa J, eds. *Frames of reference for pediatric occupational therapy*. Philadelphia: Lippincott Williams & Wilkins, 1999:205-256.

Entire book
3. Kellman RM, Marentette LJ. *Atlas of craniomaxillofacial fixation*. Philadelphia: Lippincott Williams & Wilkins, 1999.

Software
4. *Epi Info* [computer program]. Version 6. Atlanta: Centers for Disease Control and Prevention; 1994.

Online journals
5. Friedman SA. Preeclampsia: a review of the role of prostaglandins. *Obstet Gynecol* [serial online]. January 1988;71:22-37. Available from: BRS Information Technologies, McLean, VA. Accessed December 15, 1990.

Database
6. CANCERNET-PDQ [database online]. Bethesda, MD: National Cancer Institute; 1996. Updated March 29, 1996.

World Wide Web
7. Gostin LO. Drug use and HIV/AIDS [*JAMA* HIV/AIDS Web site]. June 1, 1996. Available at: http://www.ama-assn.org/special/hiv/ethics. Accessed June 26, 1997.

Figures:

A) Creating Digital Artwork

1. Learn about the publication requirements for Digital Artwork: http://links.lww.com/ES/A42
2. Create, Scan and Save your artwork and compare your final figure to the Digital Artwork Guideline Checklist (below).
3. Upload each figure to Editorial Manager in conjunction with your manuscript text and tables.

B) Digital Artwork Guideline Checklist
Here are the basics to have in place before submitting your digital artwork:

- Artwork should be saved as TIFF, EPS, or MS Office (DOC, PPT, XLS) files. High resolution PDF files are also acceptable.
- Crop out any white or black space surrounding the image.
- Diagrams, drawings, graphs, and other line art must be vector or saved at a resolution of at least 1200 dpi. If created in an MS Office program, send the native (DOC, PPT, XLS) file.
- Photographs, radiographs and other halftone images must be saved at a resolution of at least 300 dpi.
- Photographs and radiographs with text must be saved as postscript or at a resolution of at least 600 dpi.
- Each figure must be saved and submitted as a separate file. Figures should not be embedded in the manuscript text file.

Remember:

- Cite figures consecutively in your manuscript.
- Number figures in the figure legend in the order in which they are discussed.
- Upload figures consecutively to the Editorial Manager web site and enter figure numbers consecutively in the Description field when uploading the files.

Figure legends: Legends must be submitted for all figures. They should be brief and specific, and they should appear on a separate manuscript page after the references. Use scale markers in the image for electron micrographs, and indicate the type of stain used.

Color figures: The journal accepts for publication color figures that will enhance an article. Authors who submit color figures will receive an estimate of the cost for color reproduction. If they decide not to pay for color reproduction, they can request that the figures be converted to black and white at no charge. Unless otherwise noted, the cost of color figures will be charged to the author(s). Color charges will be waived for articles published through the hybrid Open Access option.

Tables: Cite tables consecutively in the text, and number them in that order. Key each on a separate sheet, and include the table title, appropriate column heads, and explanatory legends (including definitions of any abbreviations used). Do not embed tables within the body of the manuscript. They should be self-explanatory and should supplement, rather than duplicate, the material in the text.

Appendix 3.2: Health Research Authority ethical approval confirmation

Ymchwil Iechyd a Gofal Cymru
Health and Care Research Wales

NHS
Health Research Authority

Ms Rosie Powell Davies
Trainee Clinical Psychologist
Oxford Health Foundation Trust
Oxford Institute of Clinical Psychology Training and Research
Isis Education Centre, Warneford Hospital
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OX3 7JX

Email: approvals@hra.nhs.uk
HCRW.approvals@wales.nhs.uk

11 December 2023

Dear Ms Powell Davies

HRA and Health and Care Research Wales (HCRW) Approval Letter

Study title:	**To what extent do mental defeat (MD) and somatic hypervigilance (SH) mediate the relationship between childhood maltreatment and chronic pain symptomology in adults with fibromyalgia?**
IRAS project ID:	**321725**
Protocol number:	**PID 16773**
REC reference:	**23/WA/0316**
Sponsor	**Oxford Health NHS Foundation Trust**

I am pleased to confirm that **HRA and Health and Care Research Wales (HCRW) Approval** has been given for the above referenced study, on the basis described in the application form, protocol, supporting documentation and any clarifications received. You should not expect to receive anything further relating to this application.

Please now work with participating NHS organisations to confirm capacity and capability, in line with the instructions provided in the "Information to support study set up" section towards the end of this letter.

How should I work with participating NHS/HSC organisations in Northern Ireland and Scotland?
HRA and HCRW Approval does not apply to NHS/HSC organisations within Northern Ireland and Scotland.

Appendix 3.3: Study-specific pain distress measure

Please rate how much distress your pain has caused you in the last week.

0	1	2	3	4	5	6	7	8	9	10
No distress										High distress

Appendix 3.4: Pain Severity Index

1. Please rate your pain by selecting the number that best describes it at its *worst* in the last 24 hours.

   0 = least pain, 10 = most pain

2. Please rate your pain by selecting the number that best describes it at its *least* in the last 24 hours.

   0 = least pain, 10 = most pain

3. Please rate your pain by selecting the number that best describes it *on average* in the last 24 hours.

   0 = least pain, 10 = most pain

4. Please rate your pain by selecting the number that tells how much pain you have *right now*.

   0 = least pain, 10 = most pain

5. Please rate how much distress your pain has caused you in the last week.

   0 = no distress, 10 = high distress

6. Does your pain interfere with your ability to see the people who are important to you as much as you would like?

   0 = no interference, 10 = never see them

7. Does your pain interfere with recreational activities and hobbies that are important to you?

   0 = no interference, 10 = total interference

8. Do you feel more depressed, tense, or anxious than before your pain?

   0 = no depression/tension, 10 = severe depression/tension

9. Are there emotional problems caused by your pain that interfere with your family, social and/or work activities?

   0 = no problems, 10 = severe problems

Scoring instructions: final score reached by calculating mean of responses.