

Parents and Post-Traumatic Stress Disorder (PTSD): A review of their PTSD reactions to child health conditions and parental understanding of PTSD in childhood

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Thesis Portfolio Abstract

Evidence shows that Post-Traumatic Stress Disorder (PTSD) can manifest in parents following a child's medical trauma (e.g. cancer diagnosis or surgical procedure). To understand the prevalence rates and potential risk factors for parents developing PTSD a meta-analysis was undertaken. Around 30% of parents developed PTSD following paediatric medical trauma. These rates were explored with moderator analysis based on PTSD assessment type, parental gender and medical trauma. Risk factors, large in effect, were found for parental comorbid psychological responses and functioning. Results are discussed within the context of high heterogeneity. Exposure to trauma in childhood is common, with relatively high PTSD prevalence rates among children and adolescents. Children rely on adults to recognise PTSD symptoms and trauma events in order to facilitate help-seeking behaviours. Knowledge of PTSD is therefore important for key adults such as parents and teachers. Research was undertaken using an online questionnaire to identify what parents and teachers know about PTSD in children across three domains: trauma events, symptoms and treatments. Attitudes towards PTSD screening in schools were also explored. Generally, parents and teachers were able to accurately identify traumatic events and PTSD symptoms, although their understanding was broad, with many non-events and symptoms not associated with PTSD diagnostic criteria being selected. Many interventions not recommended for children were selected as effective treatments. The majority of participants supported PTSD screening. It is important that both parents and teachers can accurately recognise PTSD in children and respond accordingly. Clinical implications from both studies are discussed.

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Chapter 1: Introduction to the Thesis Portfolio

Many children are exposed to traumatic events throughout their childhood (Alisic et al., 2014; Lewis et al., 2019). Some of these children will naturally recover from the traumatic event with few, if any, difficulties (Hiller et al., 2016; Meiser-Stedman et al., 2017). However, a relatively high proportion will go on to develop traumatic stress responses and may be diagnosed with Post-Traumatic Stress Disorder (PTSD; Lewis et al., 2019). The event of hearing or learning about a loved one's medical trauma (for example receiving a diagnosis of a medical condition or undergoing medical procedures) has been classified as a potentially traumatic event according to the latest version of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association, APA, 2013).

According to the Paediatric Medical Traumatic Stress (PMTS) model (Kazak et al., 2016), children and their families can develop PTSD following medical traumas. This developmental and systemic model of PTSD postulates that the whole system (with the child at the centre) can develop traumatic stress responses with certain salient factors across three phases: pre-trauma, peri-traumatic responses and longer-term PTSD (see Appendix F).

Early identification and intervention are important when treating PTSD in children (Cohen, 2003), which can impact on treatment outcomes (Kearns, Ressler, Zatzick & Rothbaum, 2012). In order for children and adolescents to seek help for PTSD they rely on key adults within their social world. Key adults such as parents and teachers initially need to understand that some events can be traumatic. Secondly, an awareness that something may be wrong and the recognition of symptoms should follow. This should facilitate and promote help seeking behaviours from the adult for the child (Costello, Pescosolido, Angold & Burns, 1998). Therefore it is important that parents and teachers are aware and

have an understanding of PTSD in children and adolescents. Understanding what help is available and how to access services are important factors that need to be considered. Screening methods are frequently used as tools to identify children who may be struggling and could potentially benefit from psychological intervention. Screening of children would typically require parental approval and if this was undertaken within schools, their approval also.

This thesis portfolio investigates the prevalence and risk factors for parents developing PTSD following paediatric medical trauma and examines the PTSD knowledge of parents and teachers. Chapter 2 presents a meta-analysis written for publication to *Clinical Psychology Review*, which examines the prevalence of parental PTSD following paediatric medical trauma and possible risk factors. This meta-analysis was part of a wider study undertaken jointly with a fellow trainee clinical psychologist (third author in Chapter 2). The search and screens were undertaken jointly and workload shared. The meta-analysis here studies paediatric medical traumas of a chronic nature and includes medical diagnoses (such as cancer and diabetes) and invasive medical procedures (such as transplantations and PICU admissions). This meta-analysis is generally referred to throughout the thesis as ‘chronic traumas’. The second meta-analysis, hereafter referred to solely as ‘single-incident traumas’ meta-analysis, investigated the prevalence and risk factors for parents developing PTSD following traumas including road traffic accidents, burns, accidental injuries and traumas of an interpersonal nature (such as abuse).

Twelve studies were included in both meta-analyses due to the sample including traumas relevant to both studies. Sensitivity analysis was undertaken to account for bias of including studies in both meta-analyses. Once the final set of studies had been identified, data extraction was shared amongst both researchers. Quality ratings, data input, analysis and subsequent interpretation and discussion were carried out independently for each meta-

analysis. For more information regarding the shared responsibilities of this meta-analysis please contact the author of this thesis portfolio.

Chapter 4 is an empirical research project written for publication to the *Journal of Clinical Child and Adolescent Psychology*. The study investigates parents' and teachers' knowledge of PTSD in children and adolescents. Chapter 3 provides information of how the meta-analysis and empirical research project are linked together. Chapter 5 describes the pilot project that precipitated the empirical research as well as additional methodology from the PTSD knowledge study. Chapter 6 provides additional results of sensitivity analysis from the meta-analysis, the findings from the pilot project are discussed and additional findings from the PTSD knowledge study around parental sources of knowledge for PTSD have been reported. The final chapter of the portfolio integrates the findings from both the meta-analysis and the empirical research project and links this to wider psychological theory and other literature in this area of study. Clinical implications of the research are discussed with a critical appraisal of the work undertaken. Suggestions for future research have been provided throughout the portfolio. A set of appendices from both the meta-analysis and the empirical research project are provided at the end of the portfolio and references can be found in Chapters 2, 4 and 7.

Chapter 2: Meta-analysis

Prevalence and Risk Factors of Parental Post-Traumatic Stress Disorder (PTSD) following Paediatric Medical Traumas: A meta-analysis.

Written for publication to *Clinical Psychology Review*

(Author guidelines for manuscript preparation - Appendix A)

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Abstract

Research shows that some parents experience traumatic stress responses to their child's medical trauma (e.g. cancer diagnosis, surgical procedure). Factors that increase the likelihood of traumatic responses are clinically important to understand. This meta-analysis sought to identify the prevalence of parental Post-Traumatic Stress Disorder (PTSD) and potential risk factors following child medical traumas. Searches across three databases yielded 54 studies ($N=6743$) once exclusion criteria had been applied. Thirty-three potential risk factors were identified with a pooled prevalence rate of 30.3% (95% *CI* 25.3 – 35.5%) for parental PTSD. Moderator analyses were undertaken to investigate the impact of PTSD assessment type, trauma type and parental gender on prevalence rates. Risk factors with medium to large effect sizes were found for parental psychological responses and functioning, acute stress responses, child behavioural functioning, uncertainty around the illness, parental gender (female) and engaging in negative coping strategies. Findings are discussed within the context of high heterogeneity and sensitivity analysis conducted to account for risk of bias. The meta-analysis identified a high prevalence of parents developing PTSD following their child's medical trauma. The identification of these families is clinically important and risk factors can be utilised during a screening process.

Keywords: PTSD, parents, paediatric trauma, prevalence, risk-factors

Highlights

- Prevalence of PTSD among parents following medical trauma is high
- Paediatric cancer leads to highest rates of parental PTSD
- Co-morbid psychological difficulties are important risk factors
- Subjective responses (uncertainty, perceived social support) are key risk factors
- Risk factors can be used clinically when screening for families following trauma

Introduction

Indirect exposure to trauma, such as learning a loved one has been exposed to trauma, has been recognised as a traumatic event that can lead to Post-Traumatic Stress Disorder (PTSD; American Psychiatric Association, APA, 2013). Chronic health conditions are considered to meet the diagnostic criteria of PTSD according to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; APA, 2013), although this has frequently been debated (McDonald, Borntrager & Rostad, 2014; Mol et al., 2005; Weathers & Keane, 2007). Within this context, parents may develop PTSD following children receiving a medical diagnosis (e.g. cancer or Type 1 Diabetes, T1D; Greening, Stoppelbein & Cheek, 2017) or undergoing invasive medical procedures (such as transplantations; Farley et al., 2007).

It is important to understand parental responses to child trauma in addition to the child's traumatic responses. Meiser-Stedman, Smith, Yule, Glucksman & Dalgleish (2017a) found that acute parental responses to child trauma predicted child PTSD six months post-trauma. This suggests early responses of the parent are important to assess. In addition, the majority of parents are primary caregivers of children. Children are reliant on their parents to meet their basic care needs. This is particularly important if the child is recovering from trauma exposure, which can lead to PTSD as well as many other difficulties such as depression, anxiety and self-harm (including suicide attempts; Lewis et al., 2019). Evidence has found that PTSD can impede parental functioning (Wise & Delahanty, 2017), and parents may not recognise that their child is experiencing trauma responses if they too are experiencing PTSD (Meiser-Stedman et al., 2017a). Parental PTSD can have a significant impact on parents general functioning and mental health as well as costs to wider society, including costs to health services (Davidson, 2000).

Kazak and colleagues proposed the model of Paediatric Medical Traumatic Stress (PMTS; Kazak et al., 2006). Although the model predominantly discusses the course of children developing PTSD following medical trauma, they propose that the child sits within a family system and the whole family responds to trauma. This response may be dysfunctional and PTSD or Post-Traumatic Stress Symptoms (PTSS) may develop. The model outlines three phases of traumatic stress response. These phases can be best thought of as pre-trauma, peri-trauma and longer-term traumatic responses. See Appendix F for an overview of the model. Within each phase certain individual factors and responses to trauma are important to consider and could be conceptualised as potential risk factors for the development of PTSD.

In addition, the cognitive model of PTSD (Ehlers & Clark, 2000) can be considered when discussing parental trauma responses. This model acknowledges that many individuals naturally recover from trauma exposure, similar to children (Meiser-Stedman et al., 2017b; Hiller et al., 2016). Although some do not and therefore understanding factors that make it more likely should be considered. Ehlers and Clark's model highlights that PTSD becomes persistent when the trauma is perceived as seriously threatening. The model proposes that this threat is a consequence of individuals excessively and negatively appraising the trauma (Ehlers & Clark, 2000). Appraisals are subjective experiences and interpretations an individual makes regarding the trauma and therefore are important to consider when assessing trauma.

Personal vulnerability factors have been described that predispose adults to developing PTSD following traumatic events (Brewin, Andrews & Valentine, 2000; Ozer, Best, Lipsey & Weiss, 2003). Previous meta-analyses have found various risk factors including: demographic factors (gender, age and Socio-Economic Status, SES); psychiatric history and previous traumas; peri-traumatic responses (stress, fear, guilt,

helplessness and horror); and, perceived social support and threat to life. These risk factors have been found to increase the likelihood of PTSD in trauma exposed adults (Brewin et al., 2000; Ozer et al., 2003).

In addition, previous meta-analyses have sought to identify risk factors in children developing PTSD (Cox, Kenardy & Hendrikz, 2007; Trickey, Siddaway, Meiser-Stedman, Serpell & Field, 2012). These studies are important for consideration as the current meta-analysis investigates the family response to child trauma, and certain factors within the child may increase the likelihood of parents developing PTSD.

Current meta-analysis

Therefore we felt it was important to understand the prevalence of parents developing PTSD or traumatic responses following paediatric medical traumas across multiple studies. The advantage of a meta-analysis is it allows for a weighted pooled prevalence to be identified which is more accurate than individual studies.

In addition, it is important to understand any factors that can increase the likelihood of parents developing PTSD (risk factors). Such risk factors are often grouped into categories including pre-trauma (sociodemographic characteristics, history of psychopathology, previous trauma); peri-trauma (trauma severity and trauma reactions); and post-trauma (social support, cognitive processing, comorbid psychopathology). Meta-analysis allows for quantitative estimates and combined weighted effect sizes of potential risk factors assessed across multiple studies. The current meta-analysis did not limit risk factors and any potential factors was included for analysis

Previous meta-analyses have found large heterogeneity (Brewin et al., 2000; Ozer et al., 2003). This is often expected due to various methodological and clinical factors across studies (Engels, Schmid, Terrin, Olkin & Lau, 2000; Higgins, 2008), which can

include the way PTSD is assessed as well as differences across traumas. Therefore we anticipated high rates of heterogeneity due to various PTSD measures being used as well as the vast array of medical traumas included. To account for this, moderator analysis was conducted on PTSD assessment and trauma types.

Method

To the authors' knowledge no previous meta-analysis in this area had been conducted. No similar research was identified through PROSPERO, and therefore the current meta-analysis was registered (CRD42018099578).

Selection of studies

Peer-reviewed, English-language journal articles published between 1980 (when PTSD was first considered in DSM-III, APA, 1980) and June 2018 were considered for inclusion in the meta-analysis. Human study filters were also applied. The following literature databases were searched: PsycINFO, Medline (EBSCO) and PILOTS (managed by the National Center for PTSD). The following search terms and combinations were used for each database of abstracts and titles: (Parent* OR carer* OR caregiver* OR "care giver" OR mother* OR father* OR Maternal* OR Paternal*) AND (Child* OR "young person*" OR adoles* OR teen* OR infant* OR toddler* OR "young adult" OR "school child*" OR kid* OR juvenile* OR youth* OR pre-school*) AND (ptsd OR post-trauma* OR "post trauma*" OR posttrauma* OR trauma* OR "traumatic stress" OR Depress* OR "mood disorder*") AND (Trauma* OR neglect* OR maltreat* OR abuse OR illness OR Disaster* OR violen* OR accident* OR war* OR assault* OR injur*). The following Medical Subject Headings (MeSH) terms were also included in the search: 'psychological trauma', 'trauma and stressor related disorders', 'child abuse', 'child abuse, sexual', 'disasters', 'violence', 'accidents', 'warfare', 'wounds and injuries', 'stress disorders, post-traumatic', 'depression', 'mood disorders', 'parents', 'caregivers', 'mothers', 'fathers',

‘child’, ‘adolescent’, ‘infant’ and ‘young adult’. MeSH terms were introduced to index and catalogue biomedical research literature, including research on mental health disorders.

This increases the potential published articles to be included within a search. Titles and abstracts of articles were reviewed for inclusion into the meta-analysis based on inclusion and exclusion criteria. PTSD was operationalised as being present if participants either: i) met criteria for PTSD following a structured clinical interview, ii) met cut-off on a valid and reliable PTSD self-report questionnaire measure, iii) were categorised as experiencing moderate to severe PTSD on a valid and reliable PTSD self-report questionnaire measure, or iv) their scores on a valid and reliable PTSD self-report questionnaire measure were used to determine the presence of PTSD using a diagnostic algorithm. Only prevalence and risk factors for current PTSD were included in the analysis. Risk factors were operationalised as variables associated (through correlations) with PTSS or a variable used to compare PTSS among two groups (such as comparing mothers and fathers).

Inclusion and exclusion criteria

Studies with age ranges exceeding 18 years were excluded. The authors decided to keep all children under the age of 18 in the analysis despite arguments that PTSD in children under the age of 6 is different (Young & Landolt, 2018) as this meta-analysis was focussed on parental PTSD responses to a child trauma and not child PTSD.

Research articles were also excluded if they met the following criteria:

- a. Only Acute Stress Disorder (ASD) was assessed or PTSD assessed within one month post-trauma (according to DSM-5, PTSD can only be diagnosed one month after the traumatic event, APA, 2013);

- b. The article was a randomised-controlled trial (RCT), treatment or intervention study. This was applied as it was felt the sample in these studies were likely to be biased towards PTSD (or high PTSS);
- c. The article reported on parents' reaction to their own childhood trauma (or trauma occurring in adulthood);
- d. Studies where the child died or a proportion of the child sample died. This was due to the complication of grief related trauma;
- e. When traumas involved giving birth or related to pregnancy. It was unclear if this satisfied a child trauma or was also the mother's trauma and thus could be traumatic responses to mother's own trauma;
- f. Where parents were the perpetrators of the trauma (e.g. abuse). It was felt this would complicate whether the parent had PTSD due to their child's trauma;
- g. Articles that reported insufficient statistical data to calculate effect sizes for risk factors;
- h. The article was a systematic review, meta-analysis, single case review or case study; or
- i. The article was a thesis/dissertation, book chapter or qualitative study.

Studies that did not investigate paediatric medical trauma were excluded from the current meta-analysis but were used in the 'single-incident' traumas meta-analysis outlined in Chapter 1.

Risk of bias

The first and third authors (AB and LW) assessed risk of bias using a researcher-developed tool combining previously used quality assessments. Initially the Assessment Tool for Observational Cohort and Cross-Sectional Studies (National Heart Lung and Blood Institute, 2014) and Quality Appraisal Checklist for Studies Reporting Correlations and Associations (National Institute for Health and Care Excellence (NICE), 2012), were

used to derive relevant quality criteria. Questions were compared to quality checks developed for prevalence research (Hoy et al., 2012; Munn, Moola, Riitana & Lisy, 2014) and a final quality assessment checklist constructed (Appendix B). The quality assessment tool comprised 12 questions assessing the representativeness of the sample, non-response rates and reasons, recruitment procedures, inclusion and exclusion criteria, appropriate PTSD and risk factor assessments, sample size and appropriate statistical analyses. Each question was rated on a 3-point (0-2) scale, with higher scores yielding lower chance of bias. The total score for the assessment was 24 (a categorical system was used to rate risk of bias: 0-8 high risk; 9-16 moderate risk; 17-24 low risk). A total of 17 studies (31.48%) were inter-rated by first and third authors (AB and LW). These studies were a small selection of randomly selected studies ($n=8$) and nine articles featured in both the current meta-analysis and the one on 'single-incident' traumas.

Coding of Studies

When PTSD was measured in multiple ways, interview data superseded self-report questionnaire for PTSD prevalence analysis. Continuous measurement of PTSD was prioritised for risk factor estimates. For longitudinal studies, the first time point of PTSD assessment ≥ 4 weeks was used. Risk factors assessed prior to or simultaneously with PTSD assessment were included. Risk factors conducted after PTSD assessment were excluded. Studies having multiple effect sizes for the same risk factor were combined using Fisher's Z transformation which allows for the collation of the weighted average accounting for varying sample sizes (Fisher, 1915).

Sample duplication across studies was closely monitored throughout which occurred on three occasions. When identified only one prevalence rate from the study with the largest sample size or where PTSD assessment was carried out closest to four weeks post trauma was used. When effect size estimates of the same risk factor were included in

more than one article, only one from the study with the largest sample was used.

Furthermore any risk factors that were reported in only one study were not used within meta-analyses for obvious reasons; however the single effect estimates of these factors have been reported in Appendix P.

Two studies were excluded (Bruce, Gumley, Isham, Fearon & Phipps, 2010; Pasterski, Mastroyannopoulou, Wright, Zucker & Hughes, 2014) on child gender risk factor estimate as the direction could not be determined. When an effect estimate was reported for half of the sample (for example only reported for mothers in a sample of both parents), the effect size was averaged using Fisher's Z transformation. An effect size of zero was extracted when studies reported non-statistically significant findings for potential risk factors and no effect size provided ($k=56$, 16.67% of all effect sizes extracted). This is a conservative strategy as it is likely to underestimate the true effect sizes (Durlak & Lipsey, 1991), however such an approach was utilised as opposed to excluding non-significant results as this can overestimate the combined effect sizes included (Rosenthal, 1995).

Data synthesis

The meta-analyses were conducted using two statistical software packages: OpenMeta[Analyst] (which utilises the metafor package in R; Wallace et al., 2012) for prevalence and MAVIS Version 1.1.3 (Hamilton, Aydin & Mizumoto, 2017) for risk factors. The prevalence of parental PTSD from each study was extracted, with these pooled to provide a weighted estimate of the prevalence of parental PTSD.

For each risk factor a separate meta-analysis was conducted. In the current study, Pearson's correlation coefficient, r , was chosen for the effect size. This decision was based on Trickey et al. (2012) for several reasons. Firstly, r is a common metric and was found to

be the most widely reported effect estimates of the included articles. Secondly, r is easily computed and transformed from chi-square, t , d and η (see Borenstein, Hedges, Higgins & Rothstein, 2009; Cohen, 1988; Hunter & Schmidt, 2004; Rosenthal, 1994). Thirdly, r is readily interpretable in terms of practical importance (Field, 2001; Rosenthal, 1991). In addition to Trickey's method, β coefficients from univariate regression analyses were extracted, if prior correlational analysis was unavailable. Using the methodology and recommendation of Peterson and Brown (2005), β coefficients were converted to r .

Positive correlation coefficients reflect higher PTSD symptoms and a negative coefficient reflects lower PTSD symptoms. Higher values of r represent a stronger positive association with PTSD symptomology. Table A.1 (Appendix D) provides the effect sizes inputted for individual meta-analyses for each risk factor. Effect sizes were considered as small, medium and large using .1, .3 and .5 respectively (Cohen, 1988).

Arcsine of Square Root Proportion random-effects model was used for the prevalence meta-analysis. This model was used because of the expected heterogeneity of studies included in the meta-analysis. Variability was found among methodological, statistical and clinical aspects of included studies. Arcsine Transformation also prevents the confidence intervals of prevalence estimates from falling below zero. For each risk factor meta-analysis, a random-effects model was used, for similar reasons of heterogeneity.

Heterogeneity was assessed among meta-analyses by inspecting forest plots as well as Cochran's Q test (Cochran, 1954) and the I^2 statistic (Higgins & Thompson, 2002). The Q test allows for determination of whether heterogeneity within the studies included was significant. The I^2 provides a percentage of variation across studies due to heterogeneity as opposed to chance, and thus allows for an easier interpretation.

Moderator analysis

Moderator analysis was conducted using random effect models in regards to PTSD assessment type (self-report versus interview). Sub-group analysis was undertaken to identify the prevalence of parental PTSD for each paediatric medical trauma: PICU, NICU (including neonatal surgery), Cancer (including tumours and malignancies), Transplants (including heart, stem-cell and bone marrow), T1D and 'other' diseases/conditions (including epilepsy, sickle-cell, Disorder of Sex Development (DSD), asthma, Extracorporeal Membrane Oxygenation (EMO), Meningococcal and general hospital admission). Studies of mixed samples were classified as 'Mixed'. Where possible, studies that investigated multiple medical traumas and reported separate prevalence rates were separated for the purposes of sub-group analyses. Due to the high prevalence of parental PTSD among cancer traumas, a meta-regression was undertaken to investigate whether prevalence rates of cancer traumas were significantly higher compared to all other medical traumas. Moderator analysis was undertaken in regards to parental gender. Studies only investigating mothers or fathers or those studies that separated out prevalence rates among parents were included in this analysis.

Sensitivity analysis

Sensitivity analysis was undertaken to examine whether results were skewed by studies judged to have high risk of bias. Those studies were removed from the prevalence meta-analysis and any risk factor meta-analyses. The same approach was used by removing those studies that were included in the 'single-incident traumas' meta-analysis. This process was undertaken to account for further biases. Funnel plots were used to assess the potential of publication bias (Higgins & Green, 2011). However, Brewin et al. (2000) highlight that publication bias is less prone to occur in risk factor effects compared to

treatment effects. This is due to research on risks reporting both statistically significant and non-significant results.

Results

Following the application of filters and the removal of duplicate papers, 13 247 articles were identified. Titles and abstracts were reviewed by the first and third authors (AB and LW), using the above exclusion and inclusion criteria. This process resulted in 285 articles meeting eligibility criteria. Full-text reviews were carried out by AB and LW. Queried studies were discussed between AB and LW and a final decision for inclusion was agreed. When a decision could not be reached, the second author (RMS) made a final decision. Cuijpres (2016) suggests two researchers undertaking a meta-analysis can be valuable as a more thorough search and screen can be undertaken. The first exclusion criteria met was recorded for ineligibility. This resulted in a final set of 54 studies. See Figure 1 for a PRISMA diagram of this process. Articles used within the 'single-incident' traumas meta-analysis (k=29) are underlined on the PRISMA diagram. A number of articles (k=12) were used in both meta-analyses. The following study variables were extracted into a database: author, year of publication, publication country, design, sample sizes (child and parent), setting (health and country) and population. The following participant data was collected for each study: country of trauma, age of child and parent (range, mean and standard deviation), gender distribution of child and parent sample, trauma type and time since trauma. PTSD assessment data was extracted for each study: time of assessment since trauma, follow-up assessments, assessment method (self-report or clinical interview), assessment measure, number of parents meeting cut-off and diagnostic criteria for PTSD. Regarding potential risk factors the following data was extracted: type of risk factor, how it was measured and assessed and statistical data.

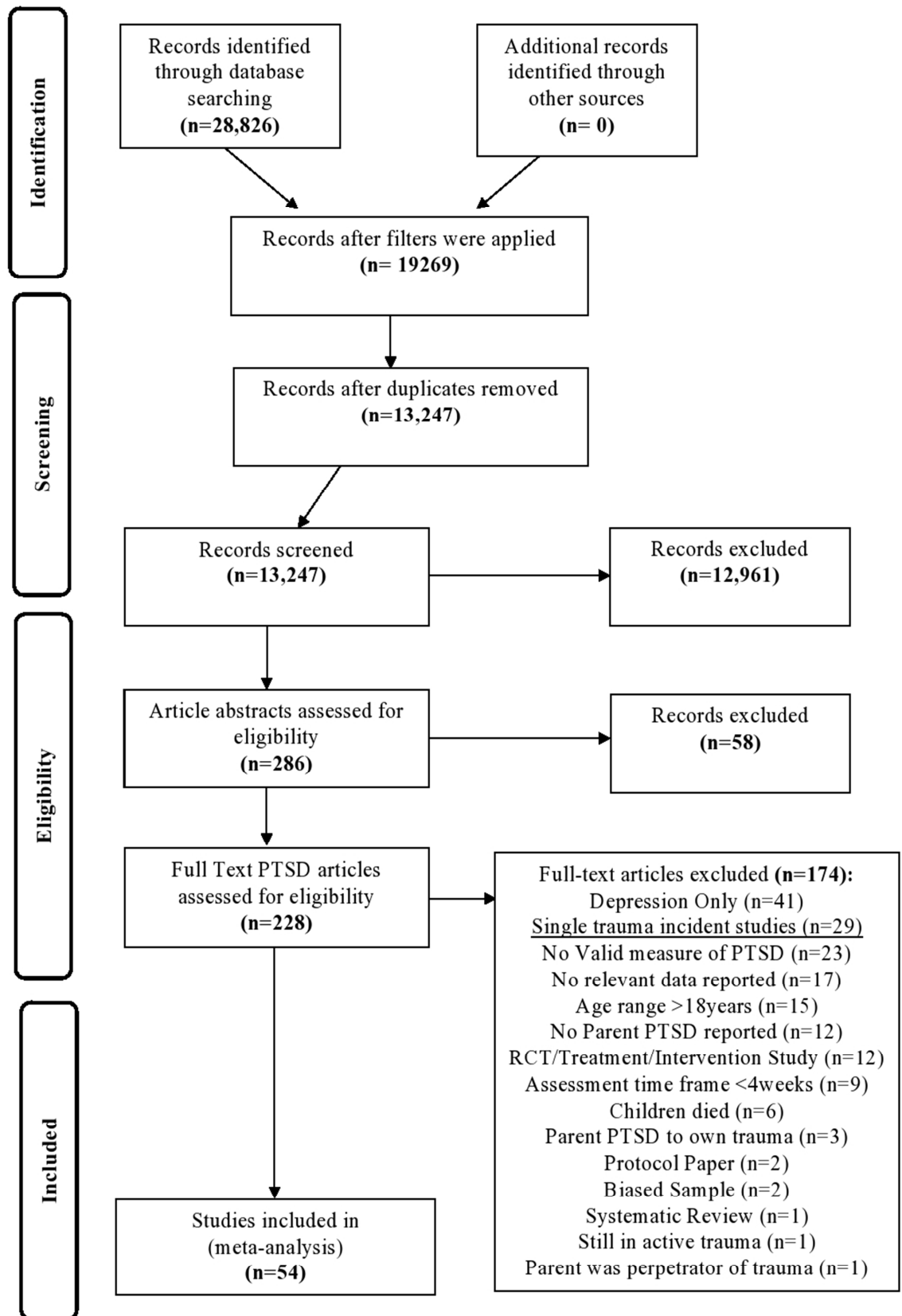


Figure 1. PRISMA diagram outlining the searching and exclusion processes.

Total sample size across studies was 6 743 (range from ten to 474). Studies contained 45 prevalence rates of parental PTSD and 52 studies reporting risk factors yielding a total of 359 effect sizes. References for the studies included in the meta-analysis can be found in Appendix G. Table A.1 (Appendix D) provides data of the risk factors extracted from each study.

Characteristics of Studies

Characteristics (trauma/medical condition, sample size, PTSD measure, time since trauma, parental age and gender, study location, prevalence of parental PTSD and risk of bias quality rating) for the 54 studies included in the meta-analysis can be found in Table 1. Please note studies with sample duplication are labelled within the table.

Risk of Bias Assessment

The proportion of studies that were rated as low, moderate and high across the 12 questions of the quality tool can be seen in Figure 2. Individual risk of bias scoring for each study can be found in Appendix C. The overall rating of each study can be found in Table 1. The first and third authors (AB and LW) inter-rated 17 (31.48%) studies, which yielded an intra-class correlation of 96.8% (*CI*: 91.6-98.8).

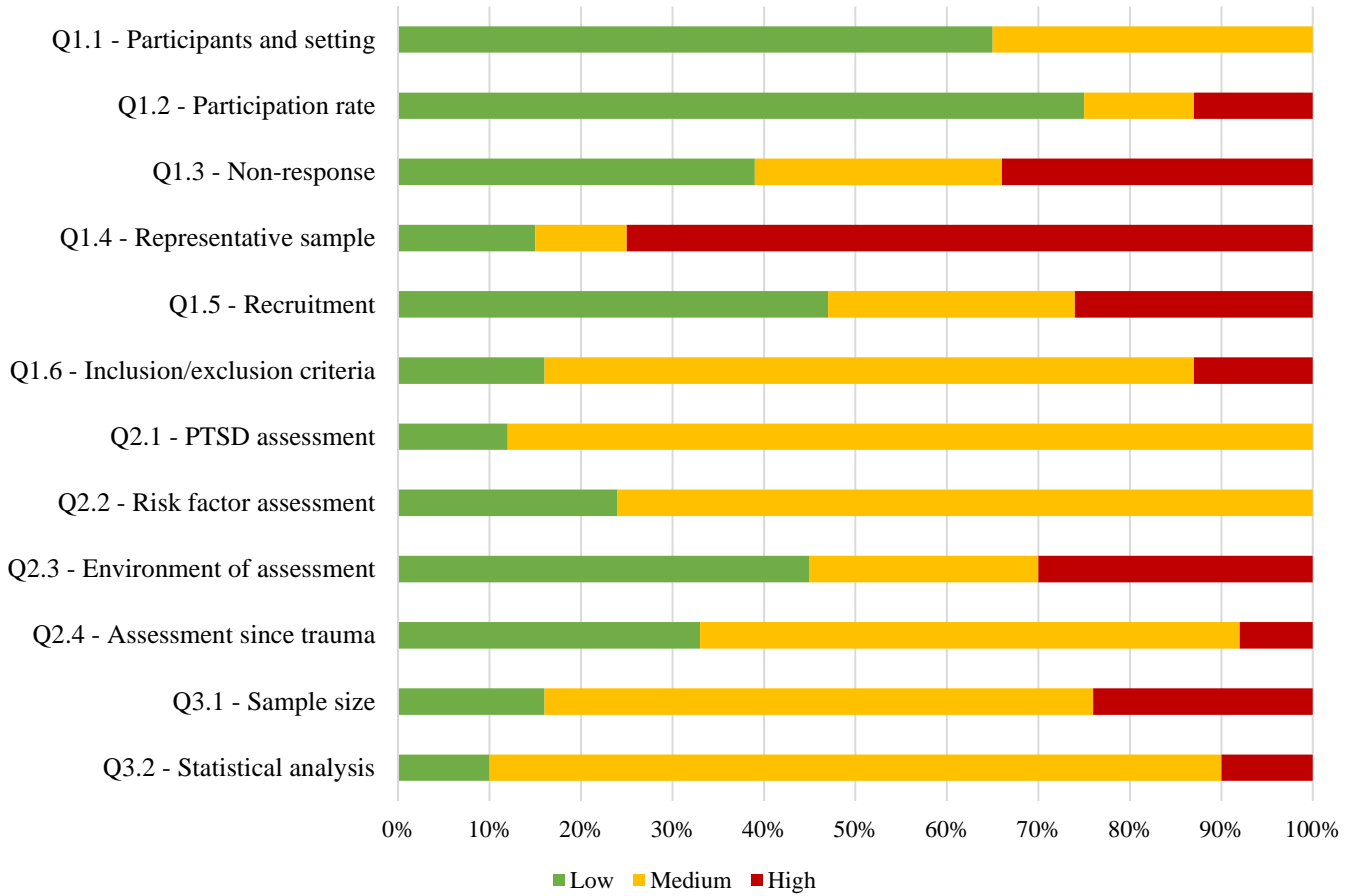


Figure 2. Proportion of studies rated as low, moderate or high risk of bias across each question.

Table 1. Included studies, sample characteristics, methods of assessment, quality ratings and prevalence of PTSD included in the meta-analysis.

Study	Medical trauma	Sample Size	PTSD Measure	Months post-trauma* <i>M±SD</i> or Median(range)	Method of assessment	Parental age		% female	Location	PTSD Prevalence		Risk of Bias Score	Risk of Bias Category
						Range	<i>M ± SD</i>			<i>N</i>	%		
Balluffi et al. (2004)	PICU	161	PCL-S	4 (2-11)	Self-Report	NR	NR	82	USA	33	20.50	15	Moderate
Binder et al. (2011)	NICU	40	IES-R	~1*	Self-Report	30 – 41	35 ± 3.1	50	USA	12	30	8	High
Bronner et al. (2008)	PICU	247	SRS-PTSD	~3*	Self-Report	NR	NR	56.68	Netherlands	31	12.55	20	Low
Bruce et al. (2010)	Brain tumour	52	IES-R	> 6*	Self-Report	31 – 53	42 ± NR	88.5	UK	15	28.85	11	Moderate
Carmassi et al. (2017)	Epilepsy	99	SCID	NR	Interview	NR	42.77 ± 7.01	66.66	Italy	9	9.09	11 [‡]	Moderate
Farley et al. (2007)	Heart Transplant	52	PDS	30 (1-216)	Self-Report	NR	NR	88.46	USA	10	19.23	15	Moderate
Forinder & Norberg (2014) [§]	Stem Cell Transplant	284/ 260	PCL-C	Multiple groups [□]	Self-Report	NR/ 25-68	NR/ 43.6 ± 7.5	56.34/5 6.15	Sweden	41	14.44	12*	Moderate
Franck et al. (2015)	General admission	107	IES-R	3*	Self-report	NR	NR	85	UK	23	21.50	18	Low
Fuemmeler et al. (2001)	Brain Tumour	28	PDS	80±NR 61 (11-231)	Self-Report	31 - 57	41.5 ± 6.6	64.3	USA	12	42.86	10	Moderate

Study	Medical trauma	Sample Size	PTSD Measure	Months post-trauma [▲] <i>M±SD</i> or Median(range)	Method of assessment	Parental age		% female	Location	PTSD Prevalence		Risk of Bias Score	Risk of Bias Category
						Range	<i>M ± SD</i>			<i>N</i>	%		
Fuemmeler et al. (2005)	Cancer/T1D	47/31	PDS	6.14±3.36 / 4.84±3.55 years [§]	Self-Report	NR	40.67±5.91/ 41.90 ± 6.88	80.1/ 74.18	USA	15/3	31.91/ 9.68	10	Moderate
Gizli Çoban et al. (2017)	Stem Cell Transplant	35	PCL-C	1.37±0.68 years	Self-Report	NR	37.09 ± 4.34	100	Turkey	23	65.71	16	Moderate
Greening et al. (2017)	Cancer & T1D	91	PCL-C	12 [*]	Self-Report	NR	36.48 ± 8.47	100	USA	NR [ⓧ]	NR	19	Low
Gudmundsdóttir et al. (2006) [§]	Chronic illness [¶]	105	HTQ	64±56.5 NR (4-216)	Self-Report	21 - 52	35.7 ± 6.4	63	Iceland	14	13.33	9.5 [*]	Moderate
Hardy et al. (2008)	Cancer	28	IES	1.0±1.47 years	Self-Report	NR	39.6 ± 5.49	89.3	USA	20	71.43	10	Moderate
Hofmann et al. (2007)	Sickle-Cell Disease	10	SCID	1 [*]	Interview	NR	NR	90.9	France	4	40	6	High
Iranmanesh et al. (2015)	Cancer	200	IES-R Persian version	2.09±1.61 years	Self-Report	NR	34.12±7.42 [■] 37.07±7.24 [▲]	50	Iran	151	75.5	14	Moderate
Karadeniz Cerit et al. (2017)	Cancer	60	CAPS	6 (1-28)	Interview	NR	36.45±7.15	100	Turkey	13	21.68	15	Moderate
Kean et al. (2006)	Asthma	108	IES-R	NR	Self-Report	NR	NR	89	USA	22	20.37	8	High

Study	Medical trauma	Sample Size	PTSD Measure	Months post-trauma [▲] <i>M±SD</i> or Median(range)	Method of assessment	Parental age		% female	Location	PTSD Prevalence		Risk of Bias Score	Risk of Bias Category
						Range	<i>M ± SD</i>			<i>N</i>	%		
Kubota et al. (2016)	Neonatal Surgery	68	IES-R	NR	Self-Report	NR	NR	100	Japan	14	20.59	13	Moderate
Landolt et al. (1998)	Cancer/surgery [○]	29	PSS German version	1.5-2 [*]	Self-Report	NR	NR	NR	Switzerland	15	51.72	15	Moderate
Landolt et al. (2002)	T1D	73	PDS German version	1.5 [*]	Self-Report	NR	NR	50.68	Switzerland	17	23.29	17	Low
Landolt et al. (2003)	Cancer & T1D [○]	355	PDS German version	~1.5 [*]	Self-Report	NR	NR	50.7	Switzerland	71	20	16	Moderate
Landolt et al. (2005)	T1D	97	PDS German version	1.5 [*]	Self-Report	NR	NR	50.52	Switzerland	18	18.56	19	Low
Landolt et al. (2012)	Cancer and T1D [○]	460	PDS German version	1.5-2 [*]	Self-Report	NR	NR	51.95	Switzerland	111	24.13	17	Low
Lefkowitz (2010)	NICU	85	PCL	1 (minimum) [*]	Self-Report	NR	29 [■] 33 [▲]	70.59	USA	11	12.94	16	Moderate
Lewis et al. (2014)	EMO	52	IES-R	NR (19-134)	Self-Report	NR	39.65±6.79	64	UK	11	21.15	14	Moderate
Magal-Vardi et al. (2004)	Cancer	36	DTS	~1 [*]	Self-Report	NR	NR	55.56	Israel	NR [Ⓚ]	NR	8	High
Masa'deh &	Cancer	416	PCL-C Arabic	23.63±14.88	Self-Report	19-56	27.07±	49.76	Jordan	NR [Ⓚ]	NR	14	Moderate

Study	Medical trauma	Sample Size	PTSD Measure	Months post-trauma [▲] <i>M±SD</i> or Median(range)	Method of assessment	Parental age		% female	Location	PTSD Prevalence		Risk of Bias Score	Risk of Bias Category
						Range	<i>M ± SD</i>			<i>N</i>	%		
Jarrah (2017)			version				6.8						
McCarthy et al. (2012)	Cancer	145	PCL-C	7.75±NR NR (5.8-12.1)	Self-Report	NR	NR	64.83	Australia	28	19.31	16	Moderate
Naderi et al. (2012)	Cancer	256	Standard questionnaire	1 (minimum) [▲]	Self-Report	29-75	32.6±14.7 [▲] 27.2±14.1 [■]	50	Iran	145	56.64	7	High
Nakajima-Yamaguchi et al. (2016)	Cancer	34	IES-R Japanese version	4.3±2.6 years	Self-Report	NR	37.9±6.4	97.1	Japan	8	23.53	10	Moderate
Norberg & Boman (2008)	Cancer	474	IES-R	29±NR NR (0.25-174)	Self-Report	21-64	41±NR	56.12	Sweden	NR [ⓧ]	NR	11	Moderate
Norberg et al. (2005)	Cancer	413	IES-R	2 groups [·]	Self-Report	NR	NR	56	Sweden	80	19.37	10	Moderate
Okado et al. (2016)	Cancer	255	IES-R	45.41±51.51 NR (1-203)	Self-Report	NR	NR	83.1	USA	NR [ⓧ]	NR	14	Moderate
Pasterski et al. (2014)	DSD	47	IES-R	5±4.23 years [▲] 7.1±4.81 years [■]	Self-Report	NR	NR	65.9	UK	13	27.66	10	Moderate
Pelcovitz et al. (1996)	Cancer	24	SCID	39.36±NR NR (0-132)	Interview	NR	44 (median)	100	USA	6	25	17	Low

Study	Medical trauma	Sample Size	PTSD Measure	Months post-trauma [▲] <i>M±SD</i> or Median(range)	Method of assessment	Parental age		% female	Location	PTSD Prevalence		Risk of Bias Score	Risk of Bias Category
						Range	<i>M ± SD</i>			<i>N</i>	%		
Phipps et al. (2005)	Cancer	121	IES-R	3 groups [§]	Self-Report	NR	NR	81.8	USA	NR ^κ	NR	10	Moderate
Pierce et al. (2017)	Cancer	67	PCL-C-6	158.3±94.6 NR (13-352) days	Self-Report	NR	NR	74.6	USA	31	42.27	17	Low
Poder et al. (2008) [§]	Cancer	243/241	PCL	61±4.2 days	Self-Report	22-59	36.7±6.3 [■] 39.1±6.9 [▲]	50.2	Sweden	61	25.10	17*	Low
Rees et al. (2004)	PICU	33/60 [□]	IES	NR (6-12) [*]	Self-Report	NR	NR	NR	UK	9	27.27	16	Moderate
Ribi et al. (2007)	T1D, cancer & Epilepsy [○]	71/139 [†]	PDS	4-6 [*]	Self-Report	NR	NR	0	Switzerland	18	25.35	13	Moderate
Rodriguez-Rey & Alsonso-Tapia (2017)	PICU	143	DTS	6 (minimum) [*]	Self-Report	NR	38.24±6.31	63.9	Spain	33	23.11	13	Moderate
Santacroce (2002)	Cancer	15	RI	5.1±1.0 weeks	Self-Report	NR	37.9±6.2	80	USA	10	66.67	17	Low
Shears et al. (2005)	Meningococcal disease	105	IES	4.1±1.07	Self-Report	NR	NR	56.2	UK	28	26.67	13	Moderate
Shi et al. (2017)	Cancer	279	PCL Chinese	1-≥25	Self-Report	NR	34.16±5.28 [■]	68.8	China	92	32.97	18	Low

Study	Medical trauma	Sample Size	PTSD Measure	Months post-trauma [▲] <i>M±SD</i> or Median(range)	Method of assessment	Parental age		% female	Location	PTSD Prevalence		Risk of Bias Score	Risk of Bias Category
						Range	<i>M ± SD</i>			<i>N</i>	%		
			version				36.56± 7.0 [▲]						
Stoppelbein & Greening (2007)	Cancer/ T1D	110	SCID	3.74±2.69 years	Interview	NR	37.8± 8.24	100	USA	8	7.27	17	Low
Stuber et al. (1996)	Cancer	105	RI	6.7±2.8 years	Self-Report	NR	NR	50	USA	50	47.62	12	Moderate
Tackett et al. (2016)	Cancer	105	IES-R	2.6±1.6	Self-Report	NR	36.9± 8.7	91.4	USA	51	48.57	14	Moderate
Taskiran et al. (2016)	Bone Marrow Transplant	27	CAPS	435.8±397.7 days	Interview	NR	36.11± 6.34	100	Turkey	8	29.63	16	Moderate
Tremolada et al. (2013)	Cancer	83	PCL	2 [*]	Self-Report	NR	37.3± 6.07	100	Italy	48	57.83	17	Low
Vernon et al. (2017)	Cancer	37	PCL	7.57±5.65	Self-Report	NR	33.82± 4.94	60	Australia	17	45.95	12	Moderate

NR = Not Reported. PICU = Paediatric Intensive Care Unit. NICU = Neonatal Intensive Care Unit. IES-R = Impact of Events Scale-Revised. PCL-S = Post-traumatic Stress Disorder Checklist Specific. SRS-PTSD = Self-Rating Scale for Post-Traumatic Stress Disorder. SCID = Structured Clinical Interview for DSM. PDS = Post-Traumatic Diagnostic Scale. PCL-C = Post-Traumatic Stress Disorder Checklist – Civilian Version. T1D = Type 1 Diabetes. HTQ = The Harvard Trauma Questionnaire. CAPS = Clinician-Administered PTSD Scale. PSS = PTSD Symptom Scale. EMO= Extracorporeal Membrane Oxygenation. DTS=Davidson Trauma Scale. PCL=PTSD Checklist. RI = Reaction Index. PTSD-SC=PTSD symptom Checklist. DSD=Disorder of Sexual Development.

[§]Sample reported in 2 studies. ^{*}Aggregated quality score, due to merged papers. [‡]Pro-rata scores due to risk factor quality question not applicable. [■] Only mothers/girls. [▲]Only fathers/boys. [§]Time off therapy. [‡]No prevalence reported in this study. [‡]Including life-threatening illnesses (cancer, cranial disease), serious diseases (T1D/epilepsy) and less-serious chronic diseases (Tourette and Brachial Plexus). ^{*}Unless otherwise stated. ^{*}Based on time-point or exclusion/inclusion criteria. [°] Sample also includes one or more of the following:

Study	Medical trauma	Sample Size	PTSD Measure	Months post-trauma [†] <i>M±SD</i> or Median(range)	Method of assessment	Parental age Range <i>M ± SD</i>	% female	Location	PTSD Prevalence <i>N</i> %	Risk of Bias Bias Score	Risk of Bias Category
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road traffic accidents, unintentional injury and burns. □ Three participation groups in the study. □ Sample of 33 were included for the prevalence as were PICU participants, a full sample of 60 was used for risk factors as this sample was for parents of children in both PICU and general paediatric wards for similar medical conditions. † Sample of 71 was used for prevalence analysis consisting of fathers of chronic illness, sample of 139 was used for risk factor analysis and includes parents of unintentional injury children. □ Group1: 66.2±41.2 (12-197 range); group 2: 97.9±45.4 (15-198 range); group 3: 68.3±45.3 (11-198 range); group 4: 54.1±35.1 (13-138 range). † Group 1: 10±15, NR (1-74); Group 2: 32±18, NR (1-72). § Group1: 0.33±0.09 years; Group2: 1.96±0.31 years. Group3: 11.4±3.5 years.

PTSD Prevalence

A total of 45 studies reported prevalence rates, which resulted in a pooled prevalence of parental PTSD following paediatric medical trauma of 30.3% (95% *CI* 25.3 – 35.5%), however this was significantly heterogeneous ($Q(44)=684.250$, $p<.001$, $I^2 = 93.57\%$; see Figure 3). Table 2 provides additional statistical information on the overall prevalence.

Moderator analysis of prevalence

Sub-group analysis can be found in Table 2. Firstly, the method of PTSD assessment was investigated. Although self-report questionnaire assessments yielded higher prevalence rates, this did not reach significance, ($\beta=-0.15$ (95% *CI* -0.31-0.02), $p=0.077$).

Secondly, prevalence for each chronic condition category was calculated using sub-group analyses. When inspecting the forest plot (Figure 4), paediatric cancer appeared to have the highest rate of parental PTSD compared to other conditions. Therefore cancer was compared against all other traumas pooled into one category. Meta-regression analysis found that prevalence estimates of parental PTSD following paediatric cancer were significantly higher compared to other conditions ($\beta=0.20$ (95% *CI* 0.11-0.30), $p<0.001$).

Thirdly, the prevalence rates among mothers and fathers were compared on permitted studies. Meta-regression analysis identified that mothers had higher prevalence rates than fathers, although this difference was not statistically significant, ($\beta=-0.10$ (95% *CI* -0.23-0.04), $p=0.152$).

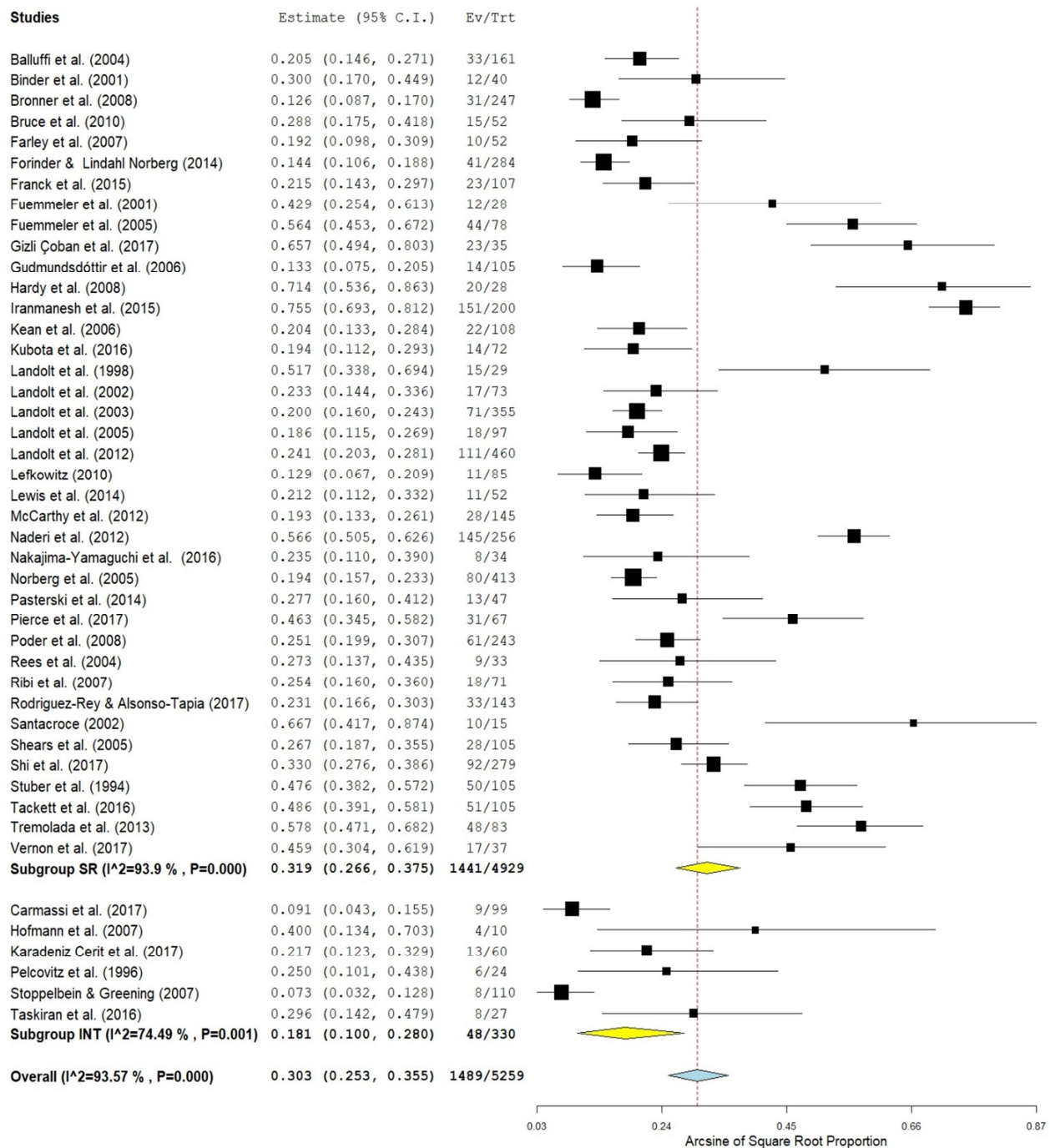


Figure 3. Forest plot for overall prevalence and prevalence by assessment type (self-report questionnaire vs interview).

Table 2. Meta-analysis outcomes for prevalence, including sub-group analysis.

Variable	<i>k</i>	Prevalence	95% CI		SE	<i>p</i>	τ^2	<i>z</i>	<i>Q</i>	<i>df</i>	<i>p</i>	<i>I</i> ²
			LL	UL								
TOTAL	45	30.3	25.3	35.5	0.03	<0.001	0.032		684.250	44	<0.001	93.57%
Assessment type	Interview	6	18.1	10.0	28.0	0.06	<0.001	7.31	19.601	5	0.001	74.49%
	Self-report	39	31.9	26.6	37.5	0.03	<0.001	20.13	622.506	38	<0.001	93.9%
Chronic condition	Cancer	19	40.7	31.6	50.0	0.05	<0.001	14.36	335.349	18	<0.001	94.63%
	Type 1 Diabetes	3	18.2	11.9	25.5	0.05	<0.001	9.76	3.053	2	0.217	34.49%
	PICU	4	19.4	13.4	26.2	0.04	<0.001	11.04	10.251	3	0.017	70.73%
	NICU	3	19.5	11.4	29.1	0.06	<0.001	7.96	4.954	2	0.084	59.63%
	Transplants	4	30.4	11.9	53.0	0.12	<0.001	4.95	40.022	3	<0.001	92.5%
	Other	7	21.2	15.5	27.5	0.04	<0.001	12.71	16.065	6	0.013	62.65%
	Mixed	6	20.8	14.0	28.7	0.05	<0.001	10.23	38.271	5	<0.001	86.94%
	All conditions (excluding cancer)	27	21.1	17.9	24.5	0.02	<0.001	23.23	114.819	26	<0.001	77.36%
Gender	Mothers	22	29.0	21.3	37.3	0.05	<0.001	12.57	293.883	21	<0.001	92.85%
	Fathers	16	20.8	13.1	29.7	0.05	<0.001	9.00	169.321	15	<0.001	91.14%

PICU = Paediatric Intensive Care Unit. NICU = Neonatal Intensive Care Unit.

Sensitivity analysis of prevalence meta-analysis

Sensitivity analysis was conducted to remove those studies rated as having high risk of bias. Meta-regression analysis identified that, although the higher risk of bias studies reported higher prevalence rates, this was not a statistically significant difference, ($\beta=0.07$ (95% *CI* -0.13-0.27), $p=0.495$).

Secondly, studies included in both the present meta-analysis and the ‘single-incident’ traumas (i.e. mixed sample studies) were removed and the meta-analysis repeated. Meta-regression analysis compared both prevalence rates which identified that prevalence rates were higher in those articles that were of a medical trauma featured solely in the present study, although this difference was not statistically significant, ($\beta=0.11$ (95% *CI* -0.01-0.23), $p=0.065$).

Publication Bias

Publication bias was investigated through a funnel plot of the prevalence data (Appendix Q). It is difficult to assess for publication bias with regards to prevalence as rates do not go below zero. Larger prevalence rates were typically found in smaller studies. These studies may be at higher risk of bias and could be less reliable to interpret.

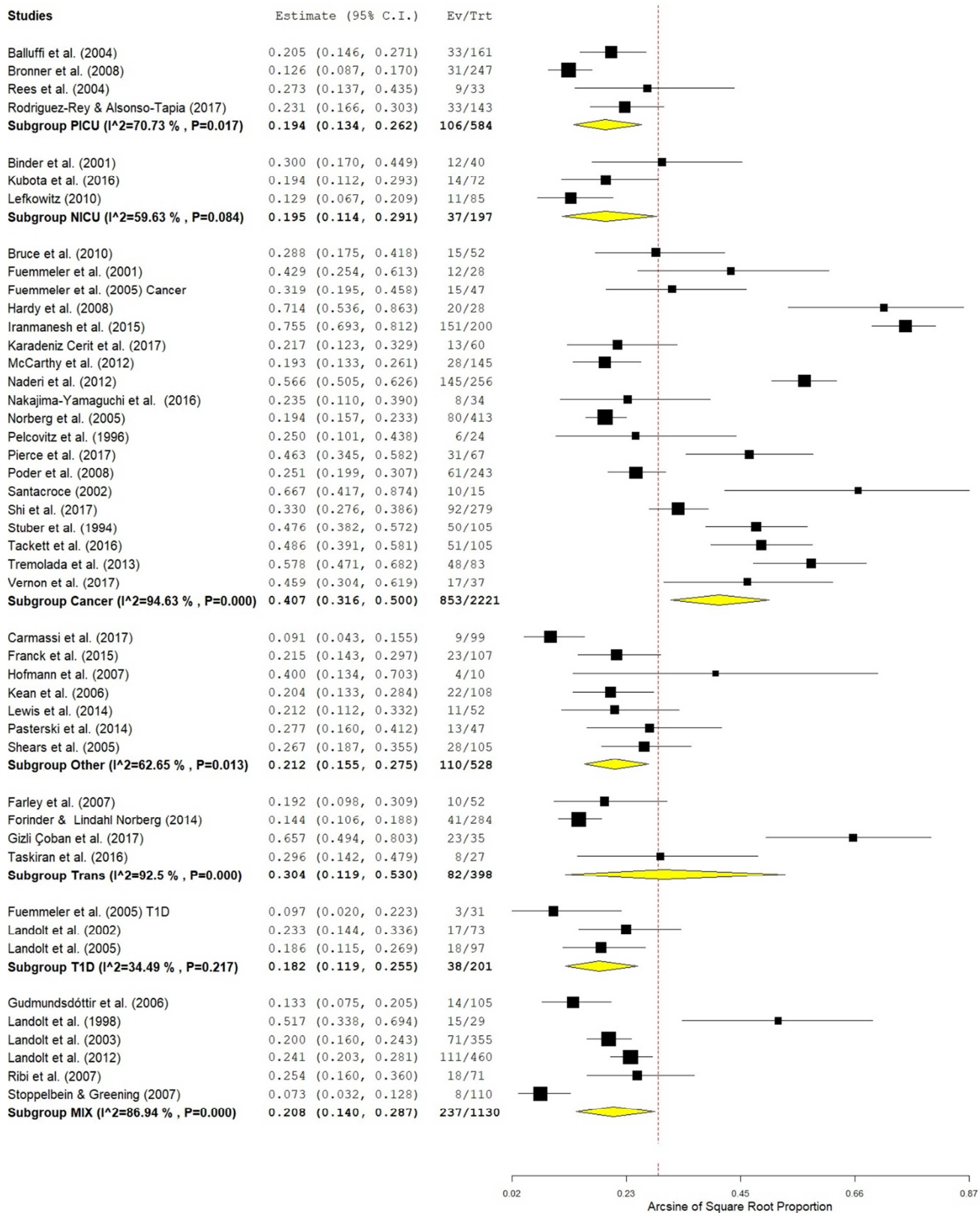


Figure 4. Prevalence estimates separated by sub-group analysis based on chronic condition type.

Risk factor estimates

Thirty-three risk factors were reported in two or more studies. Of the 54 studies, 52 reported at least one risk factor. The main findings for each individual risk factor meta-analysis can be found in Table 3. This table provides information on the number of studies (k), pooled sample size (N), estimate of overall effect size (r), 95% confidence intervals, significance test of weighted effect size estimate (z) and amount of heterogeneity (Q). ‘Recovery’ was defined as how well the child recovered from their medical trauma (and included factors such as functionality and quality of life). Of risk factor estimates, ten were considered small effects (length of hospital stay, treatment/condition length, relapse/readmission, medical complications, recovery, child PTSD, gender (mother), post-traumatic growth, perceived social support and previous trauma/adverse life events); three medium effects (child behavioural difficulties, use of *negative* coping strategies and parental uncertainty around the child illness) and five large effects (ASD, depressive symptoms, anxiety symptoms, general psychological distress, stress and partner having PTSD/PTSD symptoms).

Risk factors that were only reported in one study, and therefore could not be included in a meta-analysis are reported in Table A.2 (Appendix P).

Sensitivity analysis of risk factor estimates

Sensitivity analysis was conducted by removing those risk factor estimates from papers rated as having high risk of bias. This analysis identified that the illness severity risk factor was no longer statistically significant. In addition, the child depression risk factor was no longer computed because only one effect estimate remained. An adapted table of the risk factor estimates can be seen in Chapter 6 (Table 1).

The same was conducted by removing risk factor estimates from studies featuring in the 'single-incident' traumas meta-analysis. This process identified three main changes. Firstly, illness severity was no longer statistically significant. Secondly, poor family functioning increased to a medium effect size (.30) and was significant ($p < .001$). Finally, the following risk factors were unable to be entered into a meta-analysis as either all effect sizes were no longer included or only one effect size remained: 'acute stress disorder', 'medical complications', 'recovery', 'family psychiatric history', 'use of *positive* coping strategies', 'post-traumatic growth', 'partner having PTSD' and 'prior hospitalisation'. An adapted table of risk factors for this sensitivity analysis can be found in Chapter 6 (Table 2).

Table 3. Individual meta-analyses of individual risk factors for parental PTSD

Risk Factor	<i>k</i>	<i>N</i>	<i>r</i>	95% <i>CI</i> 's		<i>z</i>	<i>p</i>	<i>Q</i>	<i>df</i>	<i>p</i>	<i>I</i> ²
				LL	UL						
Condition/Trauma Factors											
Illness Severity	12	1276	.09	0.01	0.17	2.10	0.0359	19.94	11	0.0462	44.8%
Length of hospital stay	15	1568	.19	0.10	0.28	3.96	0.0001	44.57	14	0.0001	68.6%
Treatment/condition length	7	1340	.10	0.02	0.17	2.42	0.0156	10.74	6	0.0967	44.1%
Time since diagnosis/treatment	13	1292	-.11	-0.32	0.11	-1.01	0.3135	157.10	12	<0.0001	92.4%
Prior hospital admissions	2	268	.09	-0.10	0.27	0.92	0.3585	2.42	1	0.1197	58.7%
Readmission/relapse	5	1012	.14	0.01	0.26	2.14	0.0327	14.38	4	0.0062	72.2%
Medical complications	3	321	.13	0.02	0.24	2.34	0.0195	0.08	2	0.9609	0.0%
Recovery	5	736	.29	0.22	0.35	7.98	<0.0001	2.48	4	0.6476	0.0%
Child Factors											
Child age	18	2066	.02	-0.03	0.07	0.72	0.4727	21.12	17	0.2209	19.5%
Gender (boy/male)	14	2135	.01	-0.04	0.07	0.51	0.6121	18.68	13	0.1335	30.4%
PTSD/PTSS (self-report)	9	1074	.26	0.13	0.38	3.92	<0.0001	30.13	8	0.0002	73.4%
Depressive symptoms	2	265	.07	-0.05	0.19	1.10	0.2723	0.03	1	0.8548	0%
Behavioural difficulties	4	217	.33	0.10	0.53	2.76	0.0057	7.47	3	0.0583	59.9%
Parent Factors											
Acute Stress Disorder	3	391	.66	0.59	0.71	14.17	0.0001	2.31	2	0.3148	13.5%
General (psychological) distress	11	1046	.50	0.38	0.61	7.05	<0.0001	54.75	10	<0.0001	81.7%
Parental depressive symptoms	12	1926	.61	0.49	0.70	8.35	0.0001	127.82	11	0.0001	91.4%
Parent age	11	1090	-.18	-0.42	0.08	-1.35	0.1774	155.13	10	<0.0001	93.6%

Gender (Mother)	17	3000	.22	0.13	0.31	4.70	<0.0001	97.44	16	<0.0001	83.6%
Post-traumatic growth	2	427	.18	-0.01	0.35	1.95	0.0508	3.26	1	0.0710	69.3%
Use of <i>positive</i> coping strategies	3	298	.12	-0.33	0.53	0.52	0.6061	30.63	2	<0.0001	93.5%
Use of <i>negative</i> coping strategies	6	503	.35	0.18	0.51	3.79	0.0002	21.20	5	0.0007	76.4%
Parent anxious symptoms	11	1577	.57	0.46	0.66	8.39	<0.0001	72.20	10	<0.0001	86.2%
Parental uncertainty about child trauma	5	346	.32	0.21	0.41	5.90	<0.0001	0.48	4	0.9752	0%
Socio-Economic Status	18	2162	.02	-0.05	0.09	0.61	0.5445	36.21	17	0.0043	53.0%
Stress	7	772	.51	0.33	0.65	5.04	<0.0001	49.91	6	<0.0001	88.0%
Partner PTSD	2	352	.54	0.28	0.73	3.67	0.0002	7.97	1	0.0048	87.4%
Emotional states	4	302	.27	-0.05	0.54	1.66	0.0967	20.14	3	0.0002	85.1%
Family Factors											
Perceived social support	7	470	-.16	-0.27	-0.04	-2.62	0.0087	9.11	6	0.1675	34.1%
Ethnicity (non-white)	5	472	.09	-0.06	0.24	1.23	0.2176	9.61	4	0.0476	58.4%
Poor family functioning	5	629	.16	-0.02	0.33	1.73	0.0836	17.98	4	0.0012	77.8%
Financial burden	5	367	.20	-0.08	0.45	1.43	0.1534	27.35	4	<0.0001	85.4%
Previous trauma / life events	8	927	.17	0.07	0.27	3.34	0.0008	13.85	7	0.0538	49.5%
History of psychiatric treatment/diagnosis	2	145	.02	-0.70	0.71	0.03	0.9723	26.92	1	<0.0001	96.3%

PTSD = Post-Traumatic Stress Disorder. PTSS = Post-Traumatic Stress Symptoms.

Discussion

This meta-analysis investigated the prevalence of parents developing PTSD following their child's medical trauma. The overall prevalence rate was found to be 30.3%, across a total sample size of 6 743. However, there was significant heterogeneity across these studies ($I^2=93.57%$). This heterogeneous sample is not surprising, given the various clinical and methodological differences between included studies (Higgins, 2008).

Indeed, prevalence between different conditions varied considerably. For example T1D was found to have a prevalence of 18.2% (with relatively low heterogeneity, $I^2=34.49%$), albeit based on three studies, while cancer had a high prevalence of 40.7% (with high heterogeneity, $I^2=94.63%$), based on 19 studies. It was found that cancer diagnoses resulted in significantly more parental PTSD compared to all other medical traumas included in this meta-analysis.

Another methodological difference likely to cause high heterogeneity was the way PTSD was assessed. The majority of studies used self-report questionnaires to assess for PTSD, yielding a prevalence of 31.9%. Out of the 45 studies reporting PTSD prevalence, only six used a structured clinical interview. This yielded a prevalence rate of 18.1% in parents. Although self-report assessments appear to lead to higher prevalence rates, this difference was not found to be statistically significant.

Prevalence was also compared between mothers and fathers. Research has demonstrated that females are more likely to develop PTSD following exposure to trauma compared to males (McDonald et al., 2014; Kilpatrick et al., 2003). However, much of this research focuses on interpersonal trauma and abuse (including sexual abuse; Galovski, Blain, Chappuis & Fletcher, 2014) and therefore caution should be taken when interpreting such gender difference. Also much of the veteran PTSD literature focuses on males

(Koven, 2018), with a lack of research into female veterans (Creech & Misca, 2017).

Although the current meta-analysis found that mothers tended to have almost 50% higher prevalence rates following a child's medical trauma, this difference was not statistically significant.

The prevalence findings of the current research are consistent with a systemic model of medical trauma (PMTS; Kazak et al., 2006). This model postulates that, although the child may receive a diagnosis or undergo a medical surgical procedure, the child sits within a family system. The fairly high prevalence rates from the current meta-analysis suggest that the system around the '*child patient*' also respond to medical trauma. One of the assumptions of the PMTS model is that there are commonalities across traumatic medical events which cut across illness groups (Kazak et al., 2006). Within the current meta-analysis, paediatric cancer was found to yield significantly higher PTSD rates in parents than other medical traumas. Inspection of the trauma related risk factors can help understand why this may occur. For example, although only small in effect but still significant, length of hospital stay, condition length, relapse and medical complications were found to be important. These risk factors may indicate why cancer leads to higher PTSD rates. A medium effect was parental uncertainty of the child illness. There may be considerable amounts of uncertainty around cancer diagnoses compared to other medical traumas which could explain why this led to higher rates of parental PTSD. Uncertainty is discussed in more detail below.

Thirty-three risk factors were identified across 52 studies. Many of the risk factors were demographic and personal characteristics. Previous meta-analyses into adults have found that such demographic factors typically have small effects on PTSD. Similar findings were found in the current meta-analysis, although many factors were not statistically significant. Parent gender (mother) was found to be a significant risk factor,

however this was a small effect. It is important to note that prevalence was measured using a diagnostic binary outcome (yes/no) compared to risk factors based on a continuous scale of PTSS. This is a possible reason as to why the risk factor of parent gender was significant, but prevalence rate under meta-regression was not statistically significantly.

The PMTS model proposes three phases of medical trauma (see Appendix F). Pre-existing factors within the family (including parents) are important in the development of traumatic stress responses. Certain risk factors assessed within the current meta-analysis would be considered within the first two phases. For example research has demonstrated that parental distress and prior psychopathology are predictive of later PTSD symptoms (Best, Streisand, Catania & Kazak, 2001; Daviss et al., 2000; Kazak & Barakat, 1997; Manne et al., 2004). As seen with the current findings, many risk factors were found to be significant and large in effect: general psychological distress (.50), depressive symptoms (.61), anxious symptoms (.57) and stress (.51). It is worth noting that the way these risk factors were measured varied among studies and this should be taken into account. Studies typically measured post-trauma mental health, providing a cross-sectional comorbid picture of parental psychological reactions to trauma. It has been argued that PTSD can resemble a more general psychopathological reaction to trauma (Spitzer, First & Wakefield, 2007), which could help understand high correlations between PTSD and other psychological difficulties.

Parental uncertainty was found to be a significant risk factor with a medium effect. This is often a subjective response to trauma with regards to not knowing prognosis and treatment interventions. Emotional responses to trauma such as fear, horror and helplessness were removed from the DSM-5 criteria (APA, 2013). Subjective emotional reactions within the current meta-analysis were not found to be statistically significant, although they were measured in a small proportion of studies ($k=4$), and were often

measured with tools lacking appropriate reliability and validity psychometric properties. Illness severity was significant but did not reach the small effect cut-off. This is consistent with the cognitive model of PTSD (Ehlers & Clark, 2000), which suggests the subjective appraisals of trauma are significant in the potential development of PTSD. Severity was often measured through an objective tool and therefore the more subjective factors, such as uncertainty, appear to be more important to consider.

Perceived social support was negatively correlated with PTSS; suggesting that the more a parent perceives they have social support the less PTSS they will experience. Interventions can be developed around social support for families and children around the time of a paediatric medical trauma. Although only small in effect, it had relatively low heterogeneity across seven studies.

Acute stress reactions are factors that are found to correlate highly with later PTSS, both in the child and the family (Balluffi et al., 2004; Connolly, McClowry, Hayman, Mahony & Artman, 2004; Kassam-Adams, Garcia-Espana, Fein & Winston, 2005). Within the current study, risk factor of parent ASD was a large effect, however this was only assessed across two studies. The acute stress response, either at the time of the traumatic event or within 4 weeks following, clearly has a link to later PTSD. Meiser-Stedman et al. (2017a) found that parental acute stress responses predict child PTSD six months post-trauma and therefore are important factors to investigate for both longer-term child and parental PTSD. No studies included within the meta-analysis investigated whether child ASD predicted parental PTSD; child PTSD was found to be a risk factor, with a small effect.

Post-Traumatic Growth (PTG) is a growing area of clinical and academic research (Park & Helgeson, 2006), and would have important implications for the assessment,

intervention and risk of PTSD in parents following paediatric medical traumas. Within the current meta-analysis, PTG was *positively* correlated with PTSS. It has been documented that individuals following adverse events go on to experience positive effects, such as feeling stronger and having a positive impact on relationships (Park & Helgeson, 2006). A meta-analytic review of growth following stressful experiences highlighted individuals having less depression and more positive well-being (Helgeson, Reynolds & Tomich, 2006). Therefore those parents who experience traumatic responses to their child's medical trauma may have a period of 'growth' following the incident. Within the current meta-analysis PTG was only assessed over two studies, with a small effect, and therefore future research into the impact of PTG is warranted.

Limitations

The current meta-analysis has several limitations that should be taken into account. Firstly, very stringent exclusion criteria was applied. This was in order to fully operationalise paediatric medical trauma and PTSD. However excluded studies could impact on the prevalence and risk factors reported. It would be important for future meta-analyses to assess those traumas excluded from the current meta-analysis. However, as seen here, high heterogeneity was found across prevalence and risk factors estimates, and therefore by including more trauma types, this heterogeneity would likely increase.

Secondly, as already mentioned, the meta-analysis had a significantly high level of heterogeneity. This is likely due to the difference found across studies, such as when PTSD was measured and the different medical traumas explored. Thirdly, many of the risk factors were based on self-report or parent-report if child related. In addition some risk factors, such as PTG, were only assessed across a small number of studies and would warrant further exploration. Finally, as can be seen from the PRISMA diagram (Figure 1), no 'grey

literature' or additional literature was sought as part of the searching strategy, including contacting researchers for additional material.

Clinical Implications

The current meta-analysis suggests there are high rates of parental PTSD and potentially even more sub-clinical levels of psychopathology following paediatric medical trauma. There is also evidence to suggest there are high rates of comorbidity with anxiety and depression. Beyond the scope of this meta-analysis, but also identified, was the amount of PTSD found in children following medical traumas. This suggests that clinicians supporting families undergoing paediatric medical traumas should be fully aware of the potential traumatic and/or psychological responses that could follow. This will be difficult as the primary focus of medical teams is the primary diagnosis, such as cancer. With regards to services, screening of family members could prove valuable. An awareness of the risk factors highlighted within the current study would be important for clinicians to consider during this process. Highlighted here is awareness of subjective experiences and not solely focusing on medical variables, which although significant were often small in effect.

Future Research

Identified here was comorbid psychological functioning. Further meta-analysis on other psychological reactions to child trauma is warranted. Further research should seek to understand those risk factors outlined here that were researched by relatively few studies, such as PTG, child psychological functioning (including acute stress responses and partner PTSD). In addition to go beyond that of the parental responses and understand trauma reactions from the wider systems including siblings.

Conclusion

The current meta-analysis identified a high prevalence of parental PTSD following paediatric medical traumas. This is significant as untreated PTSD can have serious complications for the individual and their system but also impact the wider society in the context of limited health resources. Certain risk factors were identified that can place parents at increased risk of developing PTSD. These risk factors are key indicators that can be used by clinical teams treating medical traumas, to highlight those families more likely to develop PTSD following the trauma.

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Chapter 3: Bridging chapter

Summary of Meta-analysis

The meta-analysis reported in Chapter 2 identified a high prevalence of parental Post-Traumatic Stress Disorder (PTSD) and traumatic responses following paediatric medical traumas. Certain risk factors were also identified that increased the likelihood that PTSD will develop. Sub-group analysis revealed that cancer diagnoses resulted in the highest rates of PTSD in parents. Indirect exposure to trauma (i.e. hearing about a loved one's trauma) and whether diseases such as cancer, have long been debated to whether they qualify as traumatic events (Friedman, Resick, Bryant & Brewin, 2011; Weathers & Keane, 2007). A number of studies included within the meta-analysis identified children developing PTSD following direct exposure to the trauma (which was a risk factor for parents developing PTSD). In addition, the meta-analysis on 'single-incident traumas' (described in the introduction of Chapter 1) found that a relatively high proportion of children develop PTSD following different types of trauma. Therefore medical traumas as well as burns, accidental injuries and road traffic accidents can lead to children developing PTSD.

Adults knowledge of PTSD in children

The traumatic events described above are likely to lead to both the child, their parents and often the wider system coming into contact with the healthcare system. However, many other traumatic events may not involve the child entering into the healthcare system. Such traumatic events may include natural disasters (which do not result in injury), abuse (physical and sexual), neglect, interpersonal difficulties, conflict within the school, family discord, injury not requiring treatment, family members suddenly passing away and learning others have been involved in trauma. Therefore if the child is unaware that psychological difficulties can arise from such events and do not know what

signs to look for, they are reliant on adults in their social world to detect and act upon them (Logan & King, 2001; Rickwood, Deane & Wilson, 2007). Often these ‘gatekeepers’ would be the child’s parents. However, schools are increasingly depended upon to support children beyond the initial goal of education (Jorm, Kitchener, Sawyer, Scales & Cvetovski, 2010) and an awareness of childhood psychological difficulties are important for teachers to know. Teachers have been regarded as an underutilised resource for tackling mental health among children (Atkins, Hoagwood, Kutash & Seidman, 2010). Indeed schools can be thought of as the ideal place to reach children due to the necessity of their attendance and how much time they spend at school (Rickwood, 2005; Weist, Lever, Bradshaw & Owens, 2014).

Therefore it is important that the adult population who support children through a professional role or as parents are aware that exposure to traumatic events can lead to children and adolescents developing PTSD or PTSD symptomology (subclinical levels). As ‘gatekeepers’ to children seeking healthcare and treatment (Jensen et al., 2011), it is important to identify how and where parents seek knowledge of mental health. As certain traumatic events may not require medical attention, it is important to understand what adult ‘gatekeepers’ to child and adolescent health know about trauma events, PTSD symptoms and effective treatments.

Overview of Empirical Paper

Therefore an empirical research project was designed to identify what parents’ and teachers’ knowledge of PTSD presentations among children and adolescents would be. The focus of the research sought to identify what parents and teachers would endorse as PTSD traumatic events, PTSD symptoms and effective treatments recommended by national guidelines. Parents and teachers were additionally asked to rate their agreement for PTSD screening tools being used in schools. Often screens are a useful tool to identify those

experiencing traumatic responses. Often large public health initiatives aimed at children are frequently targeted through schools (e.g. the Human Papillomavirus (HPV) vaccine; Brabin et al., 2011). In addition parents were asked questions about sources of PTSD knowledge. The following chapter is the empirical paper written for publication to a peer-reviewed journal.

Chapter 4: Empirical Paper

Parents' and teachers' knowledge of PTSD in children and adolescents and attitudes towards screening

Written for publication to *Journal of Clinical Child & Adolescent Psychology*

(Author guidelines for manuscript preparation - Appendix E)

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Abstract

Objective: To identify parents' and teachers' knowledge of post-traumatic stress disorder (PTSD) in children and adolescents. Trauma exposure is common in childhood and adolescence and key adults are relied on to facilitate help-seeking behavior. This involves recognizing trauma events, possible symptoms plus an awareness of available help. Screening measures are often used to aid detection of PTSD and attitudes to their use in schools were explored.

Method: A total of 439 parents (mean age 45.16, 87.5% female) and 279 teachers (mean age 41.99, 86.4% female) completed an online researcher-developed questionnaire assessing PTSD knowledge across three domains: traumatic events, PTSD symptoms and evidence-based treatments. Participants were recruited from schools and asked to select from lists which they felt were the correct answers to each PTSD knowledge domain.

Results: Teachers and parents were accurate in recognizing trauma events and PTSD symptoms. However, their understanding was considered broad, with many events not considered traumatic and symptoms not associated with PTSD diagnostic criteria selected (such as parental divorce and substance abuse, respectively). Trauma-Focused CBT was recognized as an effective treatment, but EMDR was not. Treatments not recommended according to national guidelines were frequently endorsed. Generally, both teachers and parents were supportive of PTSD screening in schools.

Conclusion: Promotion of accurate understanding and recognition of PTSD in children and adolescents from adults perspective is necessary for early detection and intervention. Schools could be targeted to promote understanding among parents and teachers. Agreement with screening is encouraging and further research is warranted to understand barriers and facilitators.

Keywords: children, adolescents, PTSD, parents, teachers, knowledge, screening

Introduction

Trauma exposure among children and adolescents is common (Lewis et al., 2019; Taylor & Weems, 2009). Many children naturally recover from trauma exposure (Hiller et al., 2016; Meiser-Stedman et al., 2017), however a relatively high proportion develop Post-Traumatic Stress Disorder (PTSD; Lewis et al., 2019; Meltzer, Gatward, Goodman & Ford, 2000; Salmon & Bryant, 2002; Orozco, Borges, Benjet, Medlina-Mora & Lopez-Carrillo, 2008).

Early identification of PTSD in children is paramount and early intervention is important for treatment outcomes (Kearns, Ressler, Zatzick & Rothbaum, 2012). Untreated PTSD has significant costs to the child living with the debilitating condition, which can impede their schooling (Giaconia et al., 1995). Co-morbidities of anxiety and depression are common (Lewis et al., 2019; McLaughlin et al., 2013; Spinhoven, Pennix, van Hemert, de Rooij & Elinga, 2014), and has been associated with self-harm and suicide (Lewis et al., 2019). In addition the wider familial (Horesh & Brwon, 2018) and educational (Greenberg et al., 2003) systems can be affected. Furthermore, long-term financial costs to the wider society can occur in the context of a healthcare system with limited resources.

Children and adolescents rely on their parents (the term 'parent' is used to encompass all primary caregivers) to act as gatekeeper's for health related behavior (Stiffman, Pescosolido & Cabassa, 2004; Sayal, 2006). Parents are required to understand potentially traumatic events, have an awareness of trauma responses in children (symptoms) and know where and how to seek help (Mott, Stanley, Street, Grady, & Teng, 2014; Palazzo, Dell'Osso, Altamura, Stein & Baldwin, 2014; Pratt et al., 2005; Watts et al., 2015). Evidence suggests that a lack of mental health knowledge acts as a barrier to help-seeking behavior (Fox, Blank, Rovnyak & Barnett, 2001; Gulliver, Griffiths & Christensen, 2010; Mojtabai, 2009; Rickwood, Deane & Wilson, 2007; Rickwood, Deane,

Wilson & Ciarrochi, 2005). Although some research suggests problem detection does not necessitate help-seeking (Shanley, Reid & Evans, 2008), it would be crucial for parents to notice trauma responses in children.

Schools are increasingly relied upon to detect and respond to signs of emotional distress (Jorm, Kitchener, Sawyer, Scales & Cvetkovski, 2010; Rickwood, 2005). With regards to PTSD, it would be important for teachers to know what can lead to PTSD and how to identify symptoms. Indeed, there is an increase in schools seeking to be trauma informed (Sweeney, Clement, Filson & Kennedy, 2016). Whether teachers feel confident to take on this additional role is yet to be fully understood (Frauenholtz, Williford & Mendenhall, 2015; Moon, Williford & Mendenhall, 2017). In regards to PTSD, teachers present with mixed views on their confidence in working with traumatized children (Alisic, 2012; Alisic, Bus, Dulack, Pennings & Splinter, 2012). Children are more likely to be in school than mental health settings (Adelman & Taylor, 1998, 2012) and therefore it is important teachers are aware of PTSD.

Evidence suggests young people with mental health problems typically seek help from friends (Rickwood et al., 2005) and within general practice (GPs; Rickwood et al., 2007), although GP detection of mental health problems can be poor (Gulliver et al., 2010; Sayal, 2006). Often mental health professionals, such as a psychologist, are not typically considered when seeking help for mental health difficulties (Offer, Howard, Schonert & Ostrov, 1991). Parents are similar in seeking out information about mental health from informal sources and GPs (Jorm & Wright, 2007).

Knowledge of PTSD among the general population and those with PTSD symptoms has been found to be poor, particularly around treatments (Harik, Matteo, Hermann & Hamblen, 2017). Currently, little is known to what extent parents and teachers

understand PTSD presentations in children and adolescents. As outlined above, these adults in the child's life are paramount for the identification of PTSD and promoting help-seeking behaviors. To the authors' knowledge, no previous research has been conducted to seek out what parents and teachers understand about PTSD in children and adolescents, hereafter referred to as 'PTSD knowledge'. Previous research has found that teachers' recognition of depressive symptoms in children can be poor (Taggart & McMullen, 2007), although whether this is a lack of personal knowledge or training within schools is unknown.

Research questions

We sought to identify what parents and teachers would endorse as traumatic events, what symptoms they thought were associated with PTSD and what effective treatments are offered within the NHS. We also wanted to identify whether certain demographic and participant characteristics would predict PTSD knowledge across each domain. Due to schools being more involved in mental health in children, we also sought to understand whether teachers and parents would agree with PTSD screening being undertaken in schools.

Methods

Participants

The lead researcher (AB) contacted schools from three East of England counties using randomized lists generated from the Schools Web Directory (<http://schoolswebdirectory.co.uk>). A convenience sample of self-identified parents and teaching staff (including both teachers and teaching assistants, hereafter referred to as 'teachers') were recruited from 13 schools. Initially 31 primary schools (for 4-11 year olds), 27 secondary schools (for 11-18 year olds) and seven Special Educational Needs (SEN) or Pupil Referral Units (PRUs) were contacted. Four primary schools (12.9%), five

secondary schools (18.52%) and two PRUs (28.57%) took part. Primary school sizes (students on roll) ranged from 33 to 291 ($M=158$), secondary school sizes ranged from 541 to 1650 ($M=1058$), and PRU school sizes ranged from 15 to 24 ($M=20$). In addition, the Health and Safety Working Group of the National Union of Teachers (NUT; $n=200$) were also contacted and agreed to participate. The total number of teachers across all schools and the NUT was 965. The total number of children across all schools was 5 960. Only one parent for each child received information about the study, however both parents were invited to take part. The total number of parents participating was 487, yielding a response rate of 8.2%. However, this could be an over-estimation as the number of two-parent households was unknown. The total number of participating teachers was 310; yielding a response rate of 24.9%. This response rate excludes 69 additional teachers recruited through social media (e.g. Twitter and Facebook). Seven parents and three teachers chose not to complete the study after reading the participant information sheet. A further 38 parents and 28 teachers were excluded from analysis due to missing data (partial responses). Three parents were excluded due to their eldest child being under the age of seven. Therefore the final sample consisted of 439 parents and 279 teachers.

Parents were expected to have one or more school aged children between the ages of seven and 17 who attended one of the participating schools. Children under six were not included within this study due to PTSD presentations in this age group being qualitatively different from older children (Young & Landolt, 2018) and DSM-5 criteria for PTSD of children aged six and under increasing prevalence rates of PTSD (Scheeringa, Myers, Putnam & Zeanah, 2012). Teachers were required to be currently working and have at least five hours of direct contact each week with children aged seven to 17. No other exclusion criteria was applied.

Measures

To the authors' knowledge there are no standardized measures to assess PTSD knowledge. A recognition task, completed online, was developed to measure PTSD knowledge across three domains: trauma events, symptoms and effective treatments. With permission, this was based on Harik and colleagues' (2017) recognition task to measure adult veterans' knowledge of PTSD. Some changes were applied to reflect PTSD presentations in children. See appendix H for the recognition task. Due to the study aiming to understand PTSD knowledge only and concerns around overburdening participants, general mental health literacy and knowledge scales were avoided.

The online recognition task was part of a wider questionnaire. The questionnaire consisted of two sections. The first section gathered demographic characteristics. This included age, gender, previous/current military background (including a spouse in the military) and current mental health difficulties. Additionally parents were asked the number of children in the family, age of eldest child, marital, employment and residential status. Teachers were asked their length of time teaching, number of hours working directly with children per week, type of school, whether they have taught a child with PTSD and whether they had received PTSD/trauma training.

The second section was the recognition task. See Chapter 5 and 6 for information regarding the pilot and development of the online questionnaire. Participants were asked to select from three lists what they endorsed as traumatic events, PTSD symptoms and evidence-based treatments. Each list included 'actual' items (which the research team felt were the correct answers) and 'distractor' items which were deemed *a priori* incorrect responses.

A PTSD knowledge score was calculated from a combined percentage of correctly selecting the 'actual' items and correctly not selecting the 'distractor' items. Traumatic

events were considered to be an ‘actual’ item if they satisfied the DSM-5 Criterion A for PTSD (American Psychiatric Association (APA), 2013). Symptoms were considered an ‘actual’ item if they satisfied Criterion B-E of the DSM-5 criteria for PTSD (APA, 2013). Treatments were considered to be ‘actual’ items if they were recommended by U.K. national guidance on treating PTSD (National Institute of Health and Care Excellence ;NICE, 2005); the recognition task was developed before the revised 2018 guideline was published). Trauma-Focussed Cognitive Behavioral Therapy (TF-CBT) and Eye-Movement Desensitisation and Reprocessing (EMDR) were considered ‘actual’ items. At the time of the current study, EMDR was not featured in the NICE guidelines for children, however research suggested it can be effective for treating PTSD among children and adolescents. Although other interventions can be helpful for individuals or have anecdotal support for soothing PTSD symptoms, only those treatments recommended by NICE were considered ‘actual’ items. In addition, participants were asked to rate their attitude to PTSD screening tools being used in schools using a 5-point Likert scale from “Strongly Disagree” (1) to “Strongly Agree” (5). The total online questionnaire included 19 items for parents and 16 items for teachers and took approximately ten minutes to complete. See Appendix I for the full online questionnaire for parents and Appendix J for teachers. The online questionnaire was distributed using Qualtrics, an online questionnaire programme.

Procedure

Data collection took place from March 2018 to October 2018. An overview of the study and schools potential involvement was distributed to key members of schools (head teachers, deputy heads and SEN coordinators) by e-mail and telephone. The key contact from the school was asked to circulate two study advertisements: one to the parents of the school (typically by email, text or newsletter) and one to the internal staff team of teachers’ (usually by email). The research advertisement included a brief explanation of the study,

the opportunity to enter into a raffle prize draw for taking part and an online link to the questionnaire (Appendix K).

Once participants opened the links they were provided with full participant information about the study and their rights (with the option not to take part). Participants were given the email address of the lead investigator if they required additional support or information regarding the online questionnaire. Participants opting to complete the online questionnaire were taken to the first section.

Following completion of the online questionnaire, participants were given the opportunity to enter into a raffle prize draw to win a £20 online retailer gift voucher (four prizes available). This was used to recognize participants' time in completing the questionnaire. Participants were provided with debrief information of what the study was intending to identify, websites to find out more information about PTSD and the correct answers to the recognition task.

Ethical considerations

The Faculty of Medicine and Health Sciences Research Ethics Committee at the University of East Anglia (UEA) approved the project on 13th March 2018, reference number 2017/18-85 (Appendix L). Informed consent was obtained from all participants through an online information sheet and consenting statements presented at the beginning of the questionnaire. Participants were informed that by starting the questionnaire they provided their consent. Additional information regarding ethical considerations can be found in Chapter 5.

Data Analysis

To identify whether parents or teachers scored differently on each PTSD domain, Mann-Whitney U tests were conducted. This was due to the trauma knowledge scores not

being normally distributed. Further information regarding power, sampling size and statistical assumptions can be found in Chapter 5.

A series of linear regression models were conducted with each PTSD knowledge domain as the dependent variable and participant demographics and characteristics as independent variables. See below for a description of how variables were transformed into binary categories. Separate linear regressions were conducted for parents and teachers. Variables entered into the parental regression model were: parent age, parent gender, age of eldest child, relationship status, employment status, residential status, current mental health difficulty and military background. Variables entered into the teaching group regression model were: age, gender, teacher status, years working as teacher, hours per week teaching, teaching a child with PTSD, receiving PTSD training, type of school, military background and current mental health difficulty. In total, six linear regression models were conducted.

For regression analyses, demographic variables with multiple categories were transformed into binary variables, and coded 0 and 1. In the parental group, relationship status collapsed married and co-habiting into two-parent families and not-cohabiting and single into one-parent families. Employment status was categorized as working (full or part time) and not-working (full-time education and unemployed). Residential status was categorized into ownership or non-ownership (renting and living with parents). For the teaching group, time since working as a teacher was categorized into 0-10 and 11-plus years. Hours working with children was categorized into 5-20 hours or 21 plus per week. With regards to whether a teacher had worked with a child with PTSD before, those stating 'not sure' were categorized as 'no', those selecting 'prefer not to say' were excluded from regression analysis. With regards to receiving trauma training, those stating 'not sure' were categorized as 'no'. For all participants, those selecting 'do not wish to say' in regards to

psychiatric history were excluded from regression analysis. Cases excluded on regression models was by list-wise.

Descriptive statistics were used to explore the frequency of parents and teachers agreement with PTSD screens. Spearman Rho correlations were conducted to identify whether attitudes towards screening were associated with PTSD knowledge scores across the three domains. Non-parametric tests were used as the PTSD knowledge scores were not normally distributed.

An α of .05 was used to determine statistical significance. All analyses were performed using SPSS statistical package, version 25.0.

Results

Sample characteristics

Table 1 provides information on participant characteristics which were determined by self-report. The parental group were predominantly mothers (87.5%), with an average age of 45.16 ($SD=6.9$). The majority were biological parents, with eight (1.8%) parents describing themselves as foster parents/carers. The majority of parents were married (70.4%), employed (81.1%) and owned their own home (79.3%). The average number of children per household was 2.37 ($SD=0.96$), with the eldest child predominantly being aged between 11 and 20 (81.3%). Within the parental group, 33 (7.5%) participants self-reported having a military background and 103 (23.5%) self-reported having a current mental health difficulty. Military background in this sample appears higher than the national average of current military and veterans.

The teaching group were predominantly female (86.4%), with an average age of 41.99 ($SD=11.3$). There were 69 (24.7%) teaching assistants within the group. The majority of teachers worked at least 21 hours per week with children (75.3%). Regarding the type of school, 85 were from primary schools (30.5%), 132 from secondary schools

(47.3%), and 44 from PRUs (15.8%); participants reporting 'other' were from independent sector schools, colleges/sixth forms, private or online tutors, mental health settings and those teaching in multiple schools. Of the teaching group, 46 (16.5%) reported having worked with a child with PTSD, 134 (48.0%) had not and 96 (34.4%) were unsure. Only 19 (6.8%) teachers reported having received PTSD/trauma training. Within the teaching group, 26 (9.3%) self-reported having a military background and 69 (24.7%) self-reported having a current mental health difficulty.

PTSD Knowledge

Parents had a mean accuracy score for trauma events of 79.4% ($SD=15.0$). On average, parents were correct with 11.1 out of 14 trauma event items (see Table 2). Participants were accurate in selecting the 'actual' trauma events ($M=91.9\%$; $SD=14.8$) however, were less accurate at not selecting the 'distractor' items ($M=66.8\%$; $SD=30.7$), i.e. they endorsed items that were not considered traumas. Parents had a mean accuracy score for PTSD symptom recognition of 61.4% ($SD=14.2$). On average parents were correct with 8.6 out of 14 symptom items (see Table 3). Participants were accurate in selecting 'actual' items ($M=90.8\%$; $SD=14.6$), however when not selecting the 'distractor' items participants had poorer accuracy ($M=39.4\%$; $SD=28.7$), frequently selecting 'distractor' items (e.g. drug and alcohol abuse, decreased appetite and scratching self) as PTSD symptoms. Parents had a mean accuracy score for PTSD treatments of 42.4% ($SD=17.2$). On average, parents were correct with three out of seven treatment items. Correct identification of the two recommended PTSD treatments for children and adolescents varied from 17.5% for EMDR and 81.9% for TF-CBT (see Table 4). The majority of participants endorsed treatments (e.g. medication, counselling or group therapy) which are not currently recommended by NICE guidelines.

Table 1: Sample characteristics for parents and teachers

Variable	Parents (<i>n</i> =439)		Variable	Teachers (<i>n</i> =279)	
	<i>n</i> or mean± <i>SD</i>	% or Range		<i>n</i> or mean± <i>SD</i>	% or Range
Female	384	87.5	Female	241	86.4
Age	45.16±6.89	25-73	Age	41.99±11.3	21-71
Military background (yes)	33	7.5	Military background (yes)	26	9.3
Current mental health difficulty (yes)	103	23.5	Current mental health difficulty (yes)	69	24.7
No. of children	2.37±0.96	1-5	Teaching Assistant	69	24.7
			Received PTSD training (yes)	19	6.8
Age of eldest child			Years worked		
6-10	8	1.8	0-5	73	26.2
11-15	230	52.4	6-10	55	19.7
16-20	127	28.9	11-15	65	23.3
21-25	44	10.0	16-20	41	14.7
26+	30	6.8	21+	45	16.1
Relationship status			Hours worked with child/week		
Married	309	70.4	0-10	15	5.4
Relationship living together	50	11.4	11-20	52	18.6
Relationship living apart	22	5.0	21-30	138	49.5
Single	56	12.8	31+	72	25.8

Employment Status			Type of school		
Full-time	176	40.1	Primary	85	30.5
Part-time	180	41.0	Secondary	132	47.3
Education	4	0.9	SEN/PRU	44	15.8
Unemployed	21	4.8	Other	13	4.7
Other	55	12.5			
Residential status			Worked with child with PTSD		
Homeowner	348	79.3	Yes	46	16.5
Renting	87	19.8	No	134	48.0
Living w/ parents	2	0.5	Not sure	96	34.4
Other	2	0.5	Prefer not to say	3	1.1

PTSD = Post-Traumatic Stress Disorder. SEN = Special Educational Needs. PRU = Pupil Referral Unit.

Teachers had a mean accuracy score for trauma events of 81.4% ($SD=13.8$). On average teachers were correct with 11.4 out of 14 trauma event items (Table 2). Teachers were more accurate at selecting ‘actual’ traumatic events ($M=93.1\%$; $SD=12.7$) compared to ‘distractor’ items ($M=69.8\%$; $SD=28.9$). Teachers had a mean accuracy score for PTSD symptom recognition of 62.6% ($SD=15.2$). On average teachers were correct with 8.8 out of 14 symptom items (Table 3). Teachers were accurate at identifying the symptoms of PTSD ($M=92.1\%$; $SD=13.3$). However, similar to the parental group, teachers frequently selected ‘distractor’ symptoms ($M=40.4\%$; $SD=29.9$). The teaching group had a mean accuracy score for PTSD treatments of 44.2% ($SD=19.6$). On average teachers were correct with 3.1 out of seven treatment items (Table 4). Rates of endorsement for treatments from the teaching group were similar to the parental group.

Table 2: Recognition of trauma events that could lead to PTSD

Percentage who believed the event could lead to PTSD		
	Parents ($n=439$)	Teachers ($n=279$)
No current knowledge	1.4	1.8
Sexual abuse (a)	95.9	96.4
Serious car accident (a)	94.5	96.8
A terrorist attack (a)	92.3	95.7
Sudden death of family member (a)	91.6	90.7
Hearing domestic violence (a)	90.9	90.7
Physically bullied at school (a)	88.6	82.8
An earthquake (a)	81.1	86.7
Parents divorcing or separating (d)	82.5	78.1
Being lied to by parents (d)	40.3	34.4
Arguing with a best friend (d)	23.2	14.7
Watching a scary cartoon (d)	22.3	25.4
Falling off a swing (d)	21.6	20.1
Being sent home from school (d)	20.5	18.3
Losing money (d)	19.8	16.8

a – ‘actual’ items. d – ‘distractor’ items. PTSD = post-traumatic stress disorder.

Table 3: Recognition of PTSD symptoms in children and adolescents

Percentage who believed item is a PTSD symptom		
	Parents (<i>n</i> =439)	Teachers (<i>n</i> =279)
No current knowledge	2.3	4.3
Nightmares (a)	96.1	94.3
Sleep problems (a)	95.9	92.1
Angry outbursts (a)	94.1	91.0
Avoid people/places associated with trauma (a)	89.7	87.8
Avoiding talking/thinking of trauma (a)	88.4	86.0
Re-enacting trauma in play (a)	67.7	77.8
Drug and alcohol abuse (d)	86.1	79.6
Decreased appetite (d)	77.2	75.6
Scratching self (d)	72.9	68.1
Hoarding (d)	55.1	54.1
Talking constantly about the event (d)	51.7	54.5
Hearing voices to hurt other people (d)	47.6	45.5
Constantly washing hands (d)	44.4	38.0
Hyperactivity for over 3 days (d)	38.5	40.9

a – ‘actual’ items. d – ‘distractor’ items. PTSD = post-traumatic stress disorder.

Table 4: Recognition of effective treatment for PTSD in children and adolescents

Percentage who believed item is an effective PTSD treatment		
	Parents (<i>n</i> =439)	Teachers (<i>n</i> =279)
No current knowledge	16.9	25.1
TF-CBT (a)	68.1	59.5
EMDR (a)	14.6	12.2
Counselling or Psychotherapy (d)	80.0	69.5
Medication (d)	57.9	47.7
Group Therapy (d)	48.1	36.6
Relaxation techniques (d)	40.3	36.6
Animal-Assisted Therapy (d)	25.5	24.4

a – ‘actual’ items. d – ‘distractor’ items. PTSD = post-traumatic stress disorder. EMDR = Eye-Movement Desensitisation and Reprocessing. TF-CBT = trauma focussed cognitive behavioral therapy.

Parents and teachers did not differ on their overall PTSD trauma event knowledge ($U=55004.5, p=.106$); their PTSD symptom knowledge ($U=55174, p=.440$); nor their PTSD treatment knowledge ($U=35781, p=.204$).

Predictors of PTSD knowledge

Pearson's correlations were conducted to identify whether participant demographic variables were associated to PTSD knowledge domains (Table 5). For the parental group, the number of children a parent had and whether they were a homeowner negatively correlated with trauma event recognition (homeowners had higher PTSD trauma knowledge). Employment status negatively correlated with symptom recognition, with parents working having more PTSD symptom knowledge. In regards to the teaching group, current mental health difficulty was negatively correlated with effective treatment recognition. All statistically significant effects were "small" (Cohen, 1988).

No significant predictors of PTSD knowledge were identified from the six linear regression models. The results of the regression analysis can be found in Chapter 6.

Screening

Results of parents' and teachers' attitudes to PTSD screens can be found in Table 6. Over half of parents (59.9%) and teachers (71.6%) agreed (i.e. somewhat agree or strongly agree) for PTSD screens to be undertaken in schools as part of a wider screening process (Q1). When participants were asked if they would consider this following a major incident in the local area (Q2), both parents' and teachers' agreement increased to 86.4% and 86.7, respectively. On the other hand, 21.2% and 12.2% of parents and teachers respectively disagreed (strongly or somewhat disagree) for a PTSD screen as part of wider mental health screening. This disagreement decreased to 8.8% and 8.3% for parents and teachers, respectively, if a major incident occurred in the local area.

Table 5: Pearson correlations between PTSD knowledge domain and demographic variables

Variable	<u>Parents</u>			Variable	<u>Teachers</u>		
	Trauma event (n=363)	Symptoms (n=359)	Effective treatments (n=308)		Trauma event (n=244)	Symptoms (n=237)	Effective treatments (n=190)
Age	.007	.001	-.018	Age	-.021	-.069	.013
Gender	.029	-.077	.025	Gender	.019	-.062	.036
No. of children	-.096*	-.043	.044	Teaching status	.013	-.096	-.115
Eldest child	.036	.007	-.013	Years working	-.004	.002	.021
Relationship status	-.083	.018	.054	Hours working/ week	.013	.088	-.051
Employment status	-.050	-.094*	-.025	child with PTSD	.057	.075	.030
Residential status	-.130**	.012	.013	PTSD training	.079	.064	-.046
Military background	-.050	.072	.021	Type of school	.059	.020	-.094
Mental health difficulty	.074	.011	.024	Military background	.098	.018	.046
				Mental health difficulty	.007	-.082	-.123*

*Significant at the $p < .05$ level. **Significant at the $p < .01$. PTSD = Post-Traumatic Stress Disorder

Table 6. Parents and teachers attitudes towards PTSD screens in schools

	<u>Screen as wider mental health screen</u>		<u>Screen following major incident</u>	
	<u>(Q1)</u>		<u>(Q2)</u>	
	Parents <i>n</i> , %	Teachers <i>n</i> , %	Parents <i>n</i> , %	Teachers <i>n</i> , %
Strongly Agree	128, 30.2	79, 28.4	253, 60.2	163, 58.4
Somewhat Agree	126, 29.7	120, 43.2	110, 26.2	79, 28.3
Neither agree/disagree	80, 18.9	45, 16.2	20, 4.8	14, 5.0
Somewhat Disagree	45, 10.6	20, 7.2	9, 2.1	5, 1.8
Strongly Disagree	45, 10.6	14, 5.0	28, 6.7	18, 6.5

Q1: Parents *n*=242; Teachers *n*=279. Q2: Parents *n*=420; Teachers *n*=279. PTSD = Post-Traumatic Stress Disorder.

Spearman correlations identified no significant associations between agreement of screening and knowledge scores across all three PTSD domains (Table 7).

Table 7. Correlations between attitudes to screening and PTSD knowledge.

Trauma domain	<u>Parents <i>r</i> (<i>n</i>)</u>		<u>Teachers <i>r</i> (<i>n</i>)</u>	
	Screen Q1	Screen Q2	Screen Q1	Screen Q2
PTSD trauma events	-.079 (417)	-.025 (413)	-.044 (273)	.013 (274)
PTSD symptoms	-.057 (413)	-.045 (409)	-.118 (266)	-.081 (267)
PTSD treatments	.062 (357)	.071 (354)	.014 (208)	-.022 (209)

PTSD = Post-Traumatic Stress Disorder.

Discussion

An online questionnaire was administered to parents and teachers across 11 schools in the East of England to investigate their knowledge around PTSD in children and adolescents. Parents and teachers were more knowledgeable around traumatic events and symptoms associated with PTSD compared to effective treatments. These results are similar to Harik et al. (2017), who investigated PTSD knowledge among veterans and participants with PTSD symptoms. Although the current research sought to categorize traumatic events into ‘actual’ and ‘distractor’ items, it was interesting to understand how participants endorsed each item. Across the ‘actual’ events there was high recognition by parents and teachers. Events with the highest rates of endorsement were sexual abuse and

car accidents. Parental divorce yielded endorsement rates of 82.5% and 78.1% for parents and teachers, respectively. Parental divorce was considered to be a ‘distractor’ item as it would unlikely meet Criterion A of DSM-5 (APA, 2013), although there is debate over whether this event could lead to PTSD (Joseph, Mynard & Mayall, 2000). A difficulty arises when clinicians would suggest an event would *not* lead to PTSD in children but those spending their time with children *do* endorse such an event, as this raises concerns over the validity of the conceptualisation of trauma, which could lead to potential misunderstandings. Findings from the current research suggest that participants have a broader understanding of traumatic events as they selected events the study team felt would not meet diagnostic criteria for PTSD. Only a small proportion (<2%) of both teachers and parents reported having no knowledge of traumatic events.

Parents and teachers accurately identified symptoms associated with PTSD. Re-enactment of the trauma through play was the lowest endorsed symptom, although was still high (68% of parents and 77% of teachers). It is unknown why this symptom was much lower compared to other ‘actual’ symptoms. It may be that participants were imagining an older child with PTSD who may not typically display this symptom, as it is more associated with younger children. Indeed nearly half of the teachers were from secondary schools. The highest endorsed symptom of PTSD for both groups was nightmares, and secondly sleep difficulties. All other ‘actual’ symptom items reached endorsement rates of at least 90% (apart from ‘avoiding talking or thinking about trauma which was between 86-88%).

Symptoms categorized as ‘distractor’ items were also frequently endorsed by both groups. Substance abuse was the highest rated symptom not typically associated with PTSD, although has been found to be co-morbid in adults (Najavits, 2002) and alcohol dependence in children (Lewis et al., 2019). We felt this item was a distractor item for two

main reasons. Firstly, the current study was based on the research of Harik et al. (2017), who classified drug and alcohol addiction as a distractor item basing this on DSM-5 criteria (APA, 2013). Secondly, the symptom of 'risky and destructive behavior' from DSM-5 criteria of PTSD under 'alterations in arousal and reactivity' (APA, 2013) is poorly defined and it is unclear as to whether drug and alcohol abuse would qualify. Furthermore, other diagnostic classification systems do not recognize this as a symptom of PTSD (ICD-10; World Health Organization, 1992). However, we do acknowledge that this feature of PTSD diagnostic criteria warrants further debate and discussion and more clarity is warranted for clinicians, although this is beyond the remit of the current research project to debate and comment here.

Symptoms associated with other mental health presentations were also frequently endorsed as PTSD symptoms. Parents and teachers in the current study were broad in their understanding of PTSD symptoms and frequently endorsed symptoms not seen in PTSD diagnostic criteria (APA, 2013). Participant rates of endorsement of distractor symptoms were similar to that found from Harik et al. (2017). Again, only a small proportion of parents (2%) and teachers (4%) reported having no knowledge of PTSD symptoms.

TF-CBT was highly endorsed by both parents and teachers. This may have been due to the treatment having the word 'trauma' in the title. Conversely, EMDR, which is now frequently offered to children suffering with PTSD (Ahmad & Sundelin-Wahlsten, 2008; NICE, 2018), was the least endorsed treatment item. Other interventions, including counselling and medication, which have little or no evidence base and not recommended by NICE guidelines (2018) were endorsed by parents. Richardson (2001) found that 51% of parents thought medication and 93% believed talking therapies would be used by mental health professionals to treat children experiencing mental health difficulties. Both groups had less knowledge regarding PTSD treatments compared to trauma events and PTSD

symptomology. This was evident from the high proportions of parents (17%) and teachers (25%) who reported having no knowledge regarding PTSD treatments.

No predictors of PTSD knowledge were found within the current study. Mostly demographic factors were entered into the regression models and therefore alternative variables could be considered for future research. Variables used in the model were all based on self-report.

Both parents and teachers generally agreed with screening measures to be used in schools, particularly following a major incident in the local area. Although this incident was not operationalized within the question, it increased agreement for the use of screening tools. It would be important to understand more about the barriers and facilitators to PTSD screens which were beyond the remit of the current study. Considering the results in light of recent school-based public health screening initiatives, such as the human papillomavirus (HPV) vaccination, may help for future consideration of PTSD screening, albeit these screens are, qualitatively, considerably different. Evidence shows that knowledge around the HPV vaccination had little impact on endorsement (Dempsey, Zimet, Davis & Koutsky, 2006). Other factors that have been found to be important for parents in regards to agreement with the HPV vaccination was age, with concerns over younger children receiving the vaccine (Olshen, Woods, Austin, Luskin & Bauchner, 2005). This is particularly interesting with new research and diagnostic PTSD sub-categories for children under the age of six. Other factors such as professional recommendation (Olshen et al., 2005) and potential distressed experienced by children (Dempsey et al., 2006) were found to impact parental attitudes towards the vaccine which have connotations for the use of PTSD screens for children and adolescents.

Clinical Implications

The results suggest that PTSD among children and adolescents may be recognized by parents and teachers. However, they may also recognize other symptoms which are more associated with other mental health conditions which would need their own treatment, for example hearing voices, self-harm and substance abuse. This implies that parents and teachers have an understanding of mental ill health but lack an understanding of specific mental health diagnoses. As discussed earlier, it is paramount these adults accurately identify symptoms and seek help accordingly. Misunderstanding certain symptoms could impact help-seeking behaviours. Schools have been used to target public health initiatives around mental health (Jorm et al., 2010). Schools could be an environment to target parents and teachers by providing them with knowledge around PTSD.

Considering trauma exposure is high among children and a relatively high proportion develop traumatic stress responses, it is important that adults in their life are aware of PTSD. Training and educational resources may focus on effective and available treatments. This would be important for early identification and detection of PTSD. Many of the interventions endorsed by parents could be gained without accessing the NHS such as counselling, therapy dogs, relaxation strategies and medication. Knowledge of effective treatments facilitates help-seeking behavior and therefore it is important that parents and teachers have accurate information around this.

PTSD screening could be undertaken at a relatively low cost. With increases in mental health provision in schools outlined by the UK government recently (Brown, 2018), it is encouraging both parents and teachers agree with potential screening programmes. Further work is needed around the use of screening in schools.

Limitations

The current study has several limitations which should be taken into account. A school-based online questionnaire design was undertaken across three rural counties in the East of England. Therefore the results may not be generalizable to the wider country and urban areas. There was a low response rate for parents and therefore those completing the online questionnaire may have been more motivated to complete and therefore biasing the results.

The online questionnaire was researcher developed. Thus no standardized reliability and validity properties have been calculated which could impact the results. However, this was based on previous research which utilized the recognition task. As noted in the methodology section, it was important to operationalize a 'child' as aged 7-17 due to separate diagnostic criteria for children aged up to 6 (Young & Landolt). However this may have caused some confusion to participants and they may have been considering children younger than 7 when completing the questionnaire. Regarding questions around help-seeking, on inspection of the responses from participants, it was hypothesised that a selection of participants had misunderstandings around the intention of these questions. Due to these misunderstandings they were omitted from analysis and therefore may lack face validity. Furthermore, due to the questionnaire having closed questions denied deeper exploration of participant's views. In addition questions regarding confidence in finding more information may have been limited and other methodologies would have been preferred. A pilot phase was conducted to ensure the questionnaire underwent a review process (see Chapter 5). A standardized tool to assess PTSD knowledge would be valuable, particularly if interventions are developed to target parents and teachers knowledge in order to measure the impact of said interventions.

The assessment of current mental health difficulty relied upon self-report of participants which could encompass a myriad of emotional and psychological difficulties. No standardized assessment of current psychological difficulty was used and therefore this should be taken into account. The question did not account for psychiatric history nor life time history of trauma. Both of these variables could have impacted on PTSD knowledge.

PTSD can be comorbid with other psychological difficulties and therefore participants may not be thinking solely about PTSD when completing the online questionnaire and may have been thinking of other presentations such as depression and substance abuse. This could account for the broader endorsement of symptoms found in the present study.

Future research

The current research recruited both teachers and teaching assistants, however other adults within the school environment can be responsible for the welfare of children (Atkins, Hoagwood, Kutash & Seidman, 2010). Therefore understanding their PTSD knowledge may be valuable. Many adolescents would self-refer to health services. Therefore it is important to understand their own knowledge of PTSD. This is particularly important for children and adolescents who do not access school or do not live with parents. For example non-attenders, homeless, children in care and so forth. Future work on other environments outside of education may need to be targeted such as youth groups.

Further research would be valued using other methodologies such as the use of vignettes to understand PTSD knowledge. Qualitative research would allow for further exploration of why certain items on the recognition task were endorsed or not. This approach could lead to understanding some of the disparities between patients and professionals views on trauma, such as parental divorce as a traumatic event. In addition facilitators and barriers to screening can be ascertained.

More research would be warranted in the area of schools and trauma training. Many teachers in the current study reported having received no trauma/PTSD training. Moon et al. (2017) found that American teachers requested more training on trauma. Research to understand the impact of trauma training within schools would be valuable.

Conclusion

Parents and teachers are accurate at recognizing trauma events and PTSD symptoms in children. However this recognition was broad and many events not considered traumatic and symptoms not associated with diagnostic criteria of PTSD were selected. TF-CBT was identified as an effective treatment but EMDR was not, and many interventions lacking an evidence base for the treatment of PTSD were selected as being effective for children and adolescents. Further education of teachers and parents on PTSD in children and adolescents is warranted, particularly with trauma exposure being highly prevalent. Attitudes to screening of PTSD in schools was positive. Further work in this area is warranted to understand how such public health initiatives would be delivered across schools and to understand some of the barriers.

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Chapter 5: Extended Methodology

Overview of chapter

This chapter begins by providing information on the participants, procedure and the measure used in the pilot project which precluded the empirical research undertaken and presented in Chapter 4.

In regards to the empirical paper, information on power calculations and statistical assumptions will be provided. This is followed by detailed information regarding the ethical considerations of the empirical research which builds on that discussed in the methods section of Chapter 4. Finally, additional statistical analysis methodology undertaken in regards to parents' sources of knowledge for PTSD is provided.

Pilot Phase

A pilot phase was incorporated into the project to ensure the researcher-developed online questionnaire underwent a review process. This was felt important as no standardised measures were being used in the empirical research project and therefore no data existed regarding the use of this measure. Although the tool was based on previous research (Harik, Matteo, Hermann & Hamblen, 2017), it was adapted for the current research to reflect PTSD presentations in children and adolescents.

Participants

Three groups of pilot participants were involved. Firstly, the online questionnaire was sent to an Expert by Experience (EbE) who supported Patient and Public Involvement (PPI) in previous PTSD research. The EbE was a parent and an individual who has accessed mental health services for psychological treatment for trauma. The research team felt it was important to have PPI representation to comment on all aspects of the research project and materials used. Secondly, the first school to agree to participate in the empirical project was used in the pilot phase of the research. This was a small primary school in the

East of England. The school was offered a small book token (£40) for taking part in the pilot phase. The school was classed as an ‘outstanding’ school by Ofsted with approximately 40 children, aged between four and 11, attending the school. Thirdly, a small group of trainee clinical psychologists ($n=3$) who were also parents were asked if they would be willing to participate in the pilot phase of the project. All three agreed to have the online questionnaire link emailed to them.

Measures

A researcher constructed online questionnaire was developed to gather demographic information and identify what participants’ knowledge of PTSD is across three domains: trauma events, symptoms and effective treatments. The recognition task was based on Harik et al. (2017). This study looked at what people with PTSD symptoms (including a sub-sample of veterans) knew about PTSD in adulthood. Therefore changes were made to certain parts of the task in order to reflect PTSD presentations in children. The task consisted of looking at three lists (which mapped the three PTSD domains). Each list consisted of ‘actual’ and ‘distractor’ items, and participants were asked to choose which ones they felt were the correct answers to the questions. See Appendix M for the lists used in the pilot phase.

Following this, an expert in the field of childhood PTSD (and second author on the paper in Chapter 4, RMS) was consulted on the items used for the recognition task and discussions held on what items should be included within each domain. Finally the NHS Choices website for PTSD and childhood PTSD was used to clarify the three lists of items across each domain (<https://www.nhs.uk/conditions/post-traumatic-stress-disorder-ptsd>). At the end of the online questionnaire there was a set of six statements which participants were asked to rate their agreement to on a 10-point Likert scale (1=strongly disagree, 10=strongly agree) in regards to the ease, comprehension and emotional impact of the

questionnaire. Questions included: “The questions on the survey are easy to understand”, “I found completing this survey distressing or upsetting”, “The information provided before the survey was easy to understand”. Participants were also asked to discuss their agreement with the ‘actual’ and ‘distractor’ items listed within the questionnaire. Finally participants were asked to record approximately how long the questionnaire took to complete. See Appendix N for the full online pilot questionnaire.

Procedure

Participants received the online questionnaire link with a brief advertisement of the pilot project. The EbE and trainee clinical psychologists were sent the online link by email from the lead investigator (AB). The school were sent a small research advertisement and asked to send this to parents via usual communication methods.

Once the online link was accessed, participants were presented with the participant information sheet and consenting statements. After they had consented they were presented with the questionnaire. Following completion they were thanked for their participation and no longer involved in the project. Completion of the online questionnaire was anonymised and the lead investigator was not aware of individual responses.

In addition, the EbE provided detailed and constructive feedback regarding the participant information sheet and consenting statements. Separate comments and feedback were emailed to the lead investigator. This process was not part of the anonymised online questionnaire.

Ethics

The pilot project was granted ethical approval by the Faculty of Medicine and Health Sciences Research Ethics Committee at the UEA on 20th November 2017, reference number: 201718-22 (Appendix O). Please see the ethical considerations section below for

a detailed discussion of the ethical considerations of both the pilot project and the empirical research study. Results of the pilot project are presented in Chapter 6.

Empirical paper

Sample size/power

A survey sample calculator (Raosoft Inc.; <http://www.raosoft.com/samplesize.html>) was used to determine the sample size required. This programme requires the size of the population being studied being entered into the calculator. Regarding parents of dependent children, the Office for National Statistics reports there to be approximately eight million (Office for National Statistics, 2016). There are approximately 457 000 teachers in England (Department of Education, 2017). With these population sizes, a confidence level of 95%, and a margin of error of 5%, a sample size of 385 participants would be required for each group (parents and teachers). This sample calculator utilises epidemiological research (Rea & Parker, 2014), and similar formula can be found in recommendations for survey studies within psychological medicine (Kasiulevicius, Sapoka & Filipaviciute, 2006).

Furthermore, a G-power sample analysis for multiple linear regression was also computed to ensure the above sample size was adequate enough for regression analysis to be undertaken. A total sample of 132 participants would be required for a medium effect size (0.2) to be detected with probability of 0.05 to a power of 0.95, using a model with 10 predictor variables. These calculations were used when sampling for the empirical project.

Statistical test assumptions

The dependent variables of PTSD knowledge domains (trauma events, symptoms and treatments) were found not to be normally distributed and thus violated assumptions of homogeneity. To account for this, Mann-Whitney U tests were used when comparing

teachers and parents PTSD knowledge scores across the three domains. Spearman Rho correlations were used when correlating attitudes to PTSD screening and PTSD knowledge.

With regards to the statistical assumptions of regression analysis, the relationship between the independent and dependent variables were found to be linear across all six regression models by inspecting individual scatterplots. No multicollinearity was found for any variables inputted into the models by inspecting tolerance and Variance Inflation Factor (VIF) outputs. All residuals were found to be normally distributed.

Ethical considerations

The proposed research was in line with the British Psychological Society's (BPS) Code of Human Research Ethics (BPS, 2010). Participation within both the pilot project and the empirical research study was unlikely to cause any distress or harm. Participants were made aware that the project was looking at childhood PTSD and some of the information contained within the online questionnaire could be difficult or upsetting to read (e.g. sexual abuse, death of a family member). Participants were given information on what to do if they found reading this material difficult, were made aware they could stop taking part in the study by closing down the browser and informed what they should do if they suspected a child was experiencing PTSD.

It was hypothesised that some participants may experience uncomfortable feelings if they felt they performed poorly on the recognition task. Participants were made aware that they should not worry about their performance on the recognition task and that the correct answers were provided at the end of the questionnaire. Information on how to find out more about PTSD was provided. The lead investigator's email address was provided for participants if they wished to get in contact. The contact details of a member of the

clinical psychology department at the UEA was also provided who was independent from the research project if participants wanted to complain about the research or were concerned about participating.

All participants read the participant information sheet at the beginning of the online questionnaire. This outlined their involvement, what would be expected of them and provided information about withdrawing from the project. All participants were given the opportunity at the start of the questionnaire not to take part. If they selected this they were thanked and did not see any of the research material and taken to the end of the questionnaire. Participants were informed that their involvement within the project was voluntary and they could withdraw at any point by closing down the questionnaire. Once participants had submitted their responses they would not be able to withdraw their answers.

Email addresses were gathered from some participants who wished to be entered into a raffle prize draw, which was optional. Email addresses were required to send the winners their gift voucher. This was added into the study to acknowledge participants time for completing the online questionnaire. Due to financial constraints and the relatively small time scale required to complete the online questionnaire this was deemed adequate. Email addresses were stored separately from the main data set. This document was password protected and stored on a secure network. This information was only seen by the lead investigator and was deleted once prizes had been distributed.

Additional analysis

Further analysis was conducted on parents' endorsement rates of PTSD knowledge sources and where they would seek additional information. Parents were asked how confident they would be to seek out additional information from professional and non-

professional sources. This was seen as secondary analysis to the main research questions and therefore not reported in Chapter 4. This is still important to consider as knowledge of mental health services and professionals has been found to impact on help-seeking behaviour (Kelly, Jorm & Wright, 2007). Frequency of each source of knowledge was reported. No other statistical analysis was performed on this data. The findings from the additional analysis can be found in Chapter 6.

Chapter 6: Additional Results and Discussion

Overview of chapter

This chapter reports the results of sensitivity analysis undertaken for risk factor estimates of the meta-analysis outlined in Chapter 2. Following this the results of the pilot project described in Chapter 5 are presented. These results are discussed in relation to how they were used to finalise the online questionnaire used in the empirical research study presented in Chapter 4. The statistical outcomes for the linear regression models from Chapter 4 have been added. Finally, additional results of the empirical paper are presented on parents' sources of knowledge. These results are discussed and implications for further research and clinical implications are presented in regards to parents' sources of PTSD knowledge.

Meta-Analysis

Sensitivity analysis of risk factors

Table 1 provides adapted risk factor estimates after removing those individual effect sizes extracted from papers rated as having a high risk of bias. Table 2 provides adapted risk factor estimates after removing individual estimates extracted from research articles featured in the 'single-incident traumas' meta-analysis outlined in the introductory Chapter. Only risk factors that have changed from Table 3 in Chapter 2 are included. Findings of the sensitivity analysis were outlined in Chapter 2.

Table 1. Individual meta-analyses of risk factors for parental PTSD after removing effect sizes extracted from studies rated as having ‘high risk of bias’

Risk Factor	<i>k</i>	<i>N</i>	<i>r</i>	95% CI's		<i>z</i>	<i>p</i>	<i>Q</i>	<i>df</i>	<i>p</i>	<i>I</i> ²
				LL	UL						
Condition/Trauma Factors											
Illness Severity	10	1128	.09	-0.01	0.18	1.85	0.0648	19.61	9	0.0205	54.1%
Medical complications	2	281	.14	0.02	0.25	2.26	0.0236	0.04	1	0.8447	0.0%
Child Factors											
Gender (boy/male)	3	1879	.01	-0.05	0.07	0.38	0.7065	18.66	12	0.0971	35.7%
PTSD/PTSS (self-report)	7	1028	.27	0.13	0.40	3.61	0.0003	29.62	6	<0.0001	79.5%
Behavioural difficulties	3	207	.37	0.11	0.58	2.78	0.0055	6.76	2	0.0340	70.4%
Parent Factors											
General (psychological) distress	10	1006	.54	0.44	0.64	8.40	<0.0001	39.85	9	<0.0001	77.4%
Parental depressive symptoms	11	1916	.62	0.51	0.71	8.57	<0.0001	123.84	10	<0.0001	91.9%
Gender (Mother)	15	2704	.20	0.10	0.30	3.98	<0.0001	89.56	14	<0.0001	84.4%
Parent anxious symptoms	10	1567	.58	0.47	0.67	8.65	<0.0001	68.69	9	<0.0001	86.9%
Socio-Economic Status	17	2152	.02	-0.05	0.09	0.58	0.5603	36.19	16	0.0027	55.8%
Stress	6	732	.54	0.35	0.68	5.12	<0.0001	44.61	5	<0.0001	88.8%

PTSD = Post-Traumatic Stress Disorder. PTSS = Post-Traumatic Stress Symptoms.

Table 2. Individual meta-analyses of risk factors for parental PTSD after removing effect sizes from studies included in ‘single-incident trauma’ study

Risk Factor	<i>k</i>	<i>N</i>	<i>r</i>	95% CI's		<i>z</i>	<i>p</i>	Q	df	<i>p</i>	I ²
				LL	UL						
Illness Severity	6	540	.08	-0.03	0.18	1.45	0.1464	6.53	5	0.2578	23.5%
Length of hospital stay	7	456	.26	0.17	0.34	5.53	<0.0001	5.84	6	0.4416	0.0%
Treatment/condition length	6	1093	.11	0.03	0.20	2.67	0.0077	8.51	5	0.1302	41.3%
Readmission/relapse	3	744	.06	-0.07	0.19	0.90	0.3682	5.23	2	0.0730	61.8%
Child Factors											
Child age	13	1167	.01	-0.07	0.10	0.35	0.7242	20.43	12	0.0594	41.3%
Gender (boy/male)	9	1443	.01	-0.08	0.08	0.01	0.9906	16.37	8	0.0374	51.1%
PTSD/PTSS (self-report)	7	659	.29	0.19	0.39	5.26	<0.0001	9.91	6	0.1284	39.5%
Behavioural difficulties	3	149	.32	-0.08	0.62	1.59	0.1111	6.89	2	0.0320	71.0%
Parent Factors											
General (psychological) distress	10	1006	.54	0.44	0.64	8.40	<0.0001	39.85	9	<0.0001	77.4%
Parental depressive symptoms	9	1591	.60	0.47	0.70	7.35	<0.0001	90.47	8	<0.0001	91.2%
Parent age	10	1005	-.20	-0.45	0.07	-1.47	0.1418	138.01	9	<0.0001	93.5%
Gender (Mother)	12	1985	.22	0.10	0.33	3.50	0.0005	75.39	11	<0.0001	85.4%
Use of <i>negative</i> coping strategies	4	312	.39	0.19	0.55	3.77	0.0002	9.50	3	0.0234	68.4%
Parent anxious symptoms	9	1327	.56	0.42	0.67	6.78	<0.0001	67.40	8	<0.0001	88.1%

	Parental uncertainty	4	239	.31	0.19	0.43	4.90	<0.0001	0.48	3	0.9229	0%
	Socio-Economic Status	16	1700	.02	-0.06	0.10	0.46	0.6464	34.95	15	0.0025	57.1%
	Stress	4	508	.57	0.31	0.75	3.86	0.0001	35.53	3	<0.0001	91.6%
	Emotional states	2	81	.14	-0.60	0.75	0.34	0.7346	13.28	1	0.0003	92.5%
Family Factors												
	Perceived social support	5	295	-.15	-0.27	-0.04	-2.61	0.0092	3.61	4	0.4607	0%
	Ethnicity (non-white)	2	119	-.05	-0.23	0.13	-0.58	0.5616	0.10	1	0.7570	0%
	Poor family functioning	3	383	.30	0.18	0.41	4.97	<0.0001	2.35	2	0.3083	15.0%
	Financial burden	3	192	.18	-0.27	0.56	0.76	0.4465	17.02	2	0.0002	88.2%
	Previous trauma/life events	6	465	.23	0.13	0.32	4.62	<0.0001	5.65	5	0.3414	11.6%

PTSD = Post-Traumatic Stress Disorder. PTSS = Post-Traumatic Stress Symptoms

Empirical Paper – Pilot Phase

Results

A total of 24 participants (including the EbE and the three trainee clinical psychologists) completed the online pilot questionnaire. The online questionnaire was completed anonymously and therefore the findings are presented as a whole group. The pilot sample were primarily female (87.5%, $n=21$) with a mean age of 37.35 ($SD=7.57$, range=22-50). The mean number of children was 2.38 ($SD=1.10$, range=1-5). The majority of the sample were biological parents of children (95.8%, $n=23$), with one describing them self as 'other'. The majority of the sample were married (87.5%, $n=21$), employed (79.2%, $n=19$) and home owners (79.2%, $n=19$). One participant (4.2%) had a military background and four described themselves as having a current mental health difficulty (16.7%). The endorsement of all items across the three PTSD domains are presented in Table 3. Knowledge scores, as explained and calculated in the main empirical paper outlined in Chapter 4, have not been calculated for the pilot group.

Descriptive statistics of responses to the researcher-developed Likert scale to identify participants' attitudes toward the accessibility, comprehension and ease of the online questionnaire are presented in Table 4. This shows that pilot participants found the questionnaire easy to complete, easy to understand, easy to follow, that the participant information sheet (online) was easy to understand and that participants were aware of their rights. Participants did not find completing the questionnaire distressing. There was one outlier on this question with one participant rating '10'.

Table 3. Percentage of endorsement across all items on the three PTSD domains for the pilot sample (n=24).

Trauma event items	%	Symptom items	%	Treatment items	%
Family member passing away	91.7	Nightmares	100	AAT	29.2
Sexual abuse	100	Scratching self	54.2	Counselling / psychotherapy	70.8
Losing money	16.7	Hyperactivity	33.3	EMDR	25.0
Earthquake	95.8	Hoarding	45.8	Group therapy	45.8
Watching scary cartoon	41.7	Re-enacting trauma in play	87.5	Medication	41.7
Sent home from school	12.5	Talking constantly about trauma	70.8	Relaxation techniques*	45.8
Argument with friend	20.8	Angry outbursts	95.8	TF-CBT	79.2
Car accident	100	Hearing voices	41.7		
Lied to by parents	29.2	Avoid thinking/talking about trauma	91.7		
Hearing domestic violence	95.8	Decreased appetite	79.2		
Terrorist attack	95.8	Avoiding people/places associated with trauma	100		
Falling off swing	33.3	Sleep issues	100		
Physically bullied	83.3	Washing hands constantly	33.3		
Parents divorcing	75.0				

AAT = Animal-Assisted Therapy. EMDR = Eye Movement Desensitisation Reprocessing. TF-CBT = Trauma Focused Cognitive Behavioural Therapy. * Including yoga and mindfulness.

PTSD = Post-Traumatic Stress Disorder.

Table 4. Descriptive statistics of the Likert-scale from pilot sample

Question	<i>M</i>	<i>SD</i>	Range
1. The survey just completed was easy to complete	9.13	1.71	4 – 10
2. The questions on the survey are easy to understand	9.09	1.65	4 – 10
3. The survey was easy to follow	8.96	1.72	4 - 10
4. I found completing this survey distressing or upsetting	2.35	2.89	1 – 10
5. The information provided before the survey was easy to understand	8.78	2.02	4 - 10
6. I was aware of my of my rights as a participant	9.30	1.74	4 –10
7. How long did this survey take you to complete? (minutes)	6.37	2.59	3 - 10

M=mean, *SD*=standard deviation, 1=strongly disagree, 10=strongly agree.

Discussion of Pilot Phase

This section has been included to provide a discussion of how the pilot phase informed the empirical research article reported in Chapter 4. The aim of the pilot was to ensure the online questionnaire was easy to understand and complete and did not cause any distress. As no standardised measures were used within the empirical paper, this ensured the researcher-developed questionnaire underwent a review process. Generally participants did not find completing the online questionnaire upsetting or distressing. One participant rated this question ‘10’ (strongly agree). It was hypothesised that this was an accidental rating as no participants complained or contacted the lead investigator about finding the online questionnaire distressing. This outlier is likely explained by a comment regarding the change of ordering of responses which they found confusing. Generally the online questionnaire took 6 minutes to complete which was positive as the aim was for parents to complete the online questionnaire within ten minutes to decrease participant burden and increase participation rate.

Participants were given an open space to comment on anything else that could improve the online questionnaire. Some of this feedback regarded the aesthetics of the online questionnaire. For example the font was made larger and making important

instructions clearer (for example the age of the child being seven to 17 was bolded). One participant suggested adding numbers to the questions which we agreed and included for the empirical project.

In regards to questions, some participants suggested a yes/no/maybe/don't know continuum would be more applicable compared to an agreement Likert scale. The researchers felt this was a valuable suggestion. The request to add 'homemaker' to the occupation question was suggested by one participant. We decided against adding 'homemaker' as a distinct option however we added the option of 'other'. Some participants in the empirical project did add homemaker to this section.

It was suggested that a 'don't know' option be added to the recognition task for the three PTSD knowledge domains. A participant commented that they did not know any PTSD symptoms and therefore guessed the answers. This was not the aim of the research project as we were interested in participants' current knowledge around PTSD in children and adolescents. Therefore we added the option of 'no knowledge' which was selected in the empirical project, particularly within the PTSD treatment domain. Additionally, we made it clearer on the participant information sheet that the research concerned participants' current knowledge and it was fine if they did not know anything about PTSD.

One participant suggested adding a brief statement before the recognition task about individuals reacting differently to trauma. The participant explained that they were changing their responses based on different scenarios which increased their time completing the online questionnaire. We therefore felt it appropriate to add a brief statement to each of the PTSD knowledge domain questions about individual responses to trauma.

One participant reported that they found not knowing the answers to the PTSD knowledge questions frustrating, despite being given them at the end. We therefore added a statement that they would be given the correct answers at the end of the questionnaire and for them not to worry about getting any answers wrong.

One participant stated that the introduction to the questionnaire (the participant information sheet) was long. As researchers we agreed with this statement however for ethical considerations it was paramount to ensure fully informed consent was achieved. Due to the questionnaire being online it was important to provide this information in detail, which naturally was long.

We asked our service user representative to comment on the participant information sheet for the online questionnaire to improve its quality. These comments regarded information being clearer. Comments about participation rights and withdrawal and what to do if participants were not happy while completing the online questionnaire were incorporated. The online questionnaire for the pilot can be found in Appendix N and the final online questionnaires used in the research project in Appendix I and J.

Acknowledgments: we would like to thank all participants for commenting and shaping the online questionnaire for the final project. We would particularly like to thank our service user representative who commented on the online questionnaire and their particular comments regarding the participant information sheet.

Empirical Paper

Regression models

Linear regression models outlined in Chapter 4 resulted in no significant predictors of PTSD knowledge. The full results of the linear regression models for all three PTSD domains for parents and teachers are reported in Table 5 and 6 respectively.

Table 5: Linear regression models predicting PTSD knowledge for the parental group

	<u>Trauma event recognition</u>			<u>Symptom recognition</u>			<u>Treatment recognition</u>		
	<i>B ± SE</i>	<i>β</i>	<i>p</i>	<i>B ± SE</i>	<i>β</i>	<i>P</i>	<i>B ± SE</i>	<i>β</i>	<i>p</i>
Age	-.15 ± .14	-.066	.280	-.07 ± .14	-.040	.522	-.02 ± .18	-.006	.933
Gender	.69 ± 2.45	.015	.779	-3.64 ± 2.36	-.085	.125	1.05 ± 3.39	.019	.757
No. of children	-1.82 ± .93	-.114	.051	-.56 ± .91	-.037	.538	1.14 ± 1.18	.062	.336
Eldest child	2.75 ± 1.82	.092	.130	-.79 ± 1.76	.028	.656	-1.10 ± 2.34	-.031	.640
Relationship status	-1.95 ± 2.14	-.050	.364	.86 ± 2.07	.023	.677	3.02 ± 2.76	.066	.275
Employment status	-.090 ± 3.33	-.001	.979	-5.87 ± 3.28	-.099	.074	-2.94 ± 4.20	-.042	.484
Residential status	-4.06 ± 2.22	-.107	.068	.92 ± 2.15	.025	.668	-.11 ± 2.80	-.003	.968
Military background	-3.50 ± 2.82	-.066	.216	3.60 ± 2.71	.071	.186	1.39 ± 3.78	.022	.705
Mental health difficulty	2.14 ± 1.93	.060	.267	.23 ± 1.86	.007	.902	1.42 ± 2.50	.034	.571

SE = standard error. β = Beta Coefficients. B = unstandardised coefficient. PTSD = Post-Traumatic Stress Disorder.

Table 6: Linear regression models predicting PTSD knowledge domains for the teaching group

	<u>Trauma event recognition</u>			<u>Symptom recognition</u>			<u>Treatment recognition</u>		
	<i>B ± SE</i>	<i>β</i>	<i>p</i>	<i>B ± SE</i>	<i>β</i>	<i>p</i>	<i>B ± SE</i>	<i>β</i>	<i>p</i>
Age	-.01 ± .11	-.005	.956	-.05 ± .12	-.038	.667	.10 ± .17	.061	.555
Gender	1.16 ± 2.64	.029	.660	-1.56 ± 2.96	-.035	.598	2.56 ± 4.13	.046	.536
Teaching status	.12 ± 2.20	.004	.958	-3.01 ± 2.46	-.086	.222	-5.34 ± 3.49	-.119	.128
Years working	.46 ± 2.32	.016	.844	.95 ± 2.68	.031	.723	-.08 ± 3.89	-.002	.983
Hours working	.31 ± 2.13	.010	.885	3.05 ± 2.41	.086	.207	-.92 ± 3.35	-.021	.785
PTSD child	2.40 ± 2.54	.064	.346	3.26 ± 2.79	.079	.244	1.13 ± 3.80	.023	.766
PTSD train	4.21 ± 3.49	.079	.228	3.01 ± 3.83	.052	.433	-3.34 ± 4.95	-.050	.501
School type	1.57 ± 1.36	.077	.250	.78 ± 1.51	.035	.605	-2.49 ± 2.18	-.085	.256
Military background	4.53 ± 3.22	.093	.161	1.05 ± 3.55	.020	.767	3.92 ± 5.32	.056	.462
Mental health difficulty	.04 ± 2.09	.001	.985	-2.86 ± 2.31	-.083	.217	-6.19 ± 3.29	-.143	.061

SE = standard error. β = Beta Coefficients. B = unstandardised coefficient. PTSD = Post-Traumatic Stress Disorder.

Additional analysis

The results from the additional data analysis procedures described in Chapter 5 are presented in Table 7. Missing data was apparent on these questions and this is reflected within the table. Due to the low rates of missing data for certain questions, it is possible that this reflects participants ‘now knowing’ or being unsure of confidence within these sources of knowledge.

Table 7. Parents’ confidence in seeking information about PTSD. *n* %

	Yes	No	Maybe	Don’t know	Missing data
Family	108, 24.6%	148, 33.7%	116, 26.4%	11, 2.5%	56, 12.8%
Friends	116, 26.4%	121, 27.6%	137, 31.2%	8, 1.8%	57, 13.0%
General Practitioner	365, 83.1%	9, 2.1%	46, 10.5%	0	19, 4.3%
Accident & Emergency	134, 30.5%	116, 26.4%	113, 25.7%	14, 3.2%	62, 14.1%
Private health	215, 49.0%	42, 9.6%	106, 24.1%	18, 4.1%	58, 13.2%
Psychologist	364, 82.9%	4, 0.9%	39, 8.9%	4, 0.9%	28, 6.4%
School	168, 38.3%	75, 17.1%	140, 31.9%	12, 2.7%	44, 10.0%
Internet	206, 46.9%	53, 12.1%	133, 30.3%	4, 0.9%	43, 9.8%

PTSD = Post-Traumatic Stress Disorder.

Parents’ current sources of PTSD knowledge and where they would seek additional information is presented in Table 8. Participants were provided with free space on the online questionnaire to write down further information they thought relevant. This suggested participants sought information from their job (such as a nurse) and some participants stated they had no PTSD knowledge and therefore did not complete this section of the questionnaire

Table 8. Parents (*n*=439) current and future sources of PTSD knowledge

Source of knowledge	Current <i>n</i> , %	Future <i>n</i> , %
Family	66, 15%	43, 9.8%
Friends	90, 20.5%	53, 12.1%
Online	172, 39.2%	263, 59.9%
School	17, 3.9%	62, 14.1%
Health professionals	113, 25.7%	363, 82.7%
Television	223, 50.8%	12, 2.7%
Social media	83, 18.9%	21, 4.8%
Own research	130, 29.6%	295, 67.2%
Library		62, 14.1%

PTSD = Post-Traumatic Stress Disorder.

Discussion of additional results

Parents rated the GP and psychologists (operationalised as mental health professionals) as sources of knowledge that they were confident in seeking information about childhood PTSD. However, children have said they would not go to the GP for help with psychological difficulties (Biddle, Donovan, Gunnell & Sharp, 2006). Around half of the parents would also be confident in seeking information from private health services and the internet. The school was a place where 38% of parents felt confident in seeking out information; yet a small proportion would not. Approximately a third of the current sample would be confident in seeking information from accident and emergency departments, yet another third would not. Only a small proportion of 999 calls are of a mental health nature (NHS Digital, 2018), which maybe explains that people in mental health crisis do not seek out help from emergency departments. A high proportion of the sample (33%) did not feel confident in seeking help from their family or friends (28%). Previous research highlights that friends and family are key resources regarding mental health difficulties (Rickwood et al., 2005). It is important to know where parents would go to seek out advice with regards

to PTSD. Therefore these sources of knowledge can be targeted to ensure correct and accurate information is shared and pathways to help are known.

Within the current sample, 50% of parents sought PTSD knowledge from the television, which is considerably larger than previous research on mental health knowledge (Behrouzian & Neamatpour, 2010). Participants were able to select as many sources of knowledge that applied to them. Television was the most frequently chosen option for current PTSD knowledge. This was a closed option question and therefore it is unknown what sort of television media participants were viewing. PTSD is frequently reported in both news and documentaries. However there are also PTSD references in drama, film and soap operas which may be inaccurate. This possibly could explain why some of the non-PTSD symptoms were endorsed by the parental group (see Chapter 4).

The internet was a source of current knowledge, with 39% of parents endorsing the internet. Noar (2006) has suggested the use of mass media for mental health promotion. The internet should be considered when targeting public knowledge regarding PTSD and wider mental health conditions. The school was not typically used to gain information of PTSD. Around a quarter of the sample gained knowledge from health professionals. This is concerning as children and families are much more likely to come into contact with the school than they are mental health professionals. The option for health professional was not operationalised as mental health specifically, and therefore could include the GP.

Where parents would seek out further information was an important question. This is where interventions to increase awareness and knowledge around PTSD can be targeted. Health professionals were the most frequently chosen source, with 83% of the sample choosing this option. This is significantly higher than previous research (Shanley et al., 2008), however this was physicians and the current 'health professional' option could

encompass many types of professionals. This is encouraging as it would be hoped that health professionals have knowledge of PTSD or at least signposting parents to valid and reliable resources. The majority of parents stated they would complete their own research, which can mean many options which needs further exploration. Over half (60%) of the parents said they would use the internet. As previously mentioned the material on the internet can be varied, although there are certain websites from organisations that are reliable and valid information regarding PTSD can be accessed. Television and social media were not frequently chosen for gaining further knowledge of PTSD as this can involve a fountain of misinformation. Again friends and family were not frequently chosen for gaining further knowledge. Much of the previous research focuses on gaining help and not necessarily gaining information. However there seems to be a disparity between where to seek help and where to gain information. The school was only endorsed as a place to gain more knowledge about PTSD by a small proportion of parents (14%). Jorm et al. (2010) found that children do not tend to seek help from teachers or the school for their emotional distress. Many previous researchers have stated that schools are a great place to target interventions for children's mental health (Rickwood, 2005; Weist, Lever, Bradshaw & Owens, 2014).

As described in the discussion section of the empirical paper (Chapter 4), there are several limitations which should be taken into account when interpreting the findings. The generalisability of the current findings are limited and may not represent the wider geographical area. Parents selected from a list of options and further exploration is needed. It would have been valuable to allow participants to expand on their answers. This was avoided in the current project due to the lack of experience in analysing and collating more qualitative data as well as reducing burden to participants. Future research could explore in more depth where parents seek information about PTSD.

Chapter 7: Discussion and Critical Evaluation

Overview of chapter

This final chapter summarises and integrates the main findings from both the meta-analysis outlined in Chapter 2 and the empirical research project reported in Chapter 4. Both research articles will be critically evaluated and their strengths and limitations discussed. Considerations for future research will be reported followed by an exploration of the overall clinical implications. A section has been added regarding reflections of completing the thesis portfolio. Finally, a conclusion from of the whole portfolio is reported.

Main findings

Meta-analysis

The meta-analysis aimed to identify the prevalence of parents developing post-traumatic stress disorder (PTSD) following paediatric medical trauma (e.g. receiving a cancer diagnosis or undergoing a medical procedure). In addition, risk factor estimates were studied to explore whether certain variables increased the likelihood of parents developing PTSD. The advantage of undertaking a meta-analysis is that it provides a weighted pool of results across multiple studies and therefore produces a more accurate finding. Moderator analyses were undertaken to explore prevalence rates by PTSD assessment type (self-report questionnaire versus clinical interview), the type of medical trauma and parental gender. Sensitivity analysis was carried out to account for biases.

The meta-analysis extracted 45 prevalence rates and identified 33 potential risk factors extracted from 54 research studies. The weighted pooled prevalence of parents developing PTSD following paediatric medical trauma was 30.3%. Moderator analysis identified that when self-report instruments were used to assess for PTSD a higher prevalence rate was found compared to structured clinical interviews. However this was

not statistically different. Mothers were found to have higher prevalence rates compared to fathers, however this was not statistically significant.

In regards to medical trauma, sub-group analysis identified cancer diagnoses yielded a higher prevalence rate compared to all other medical traumas. When all other medical traumas were compared to cancer using meta-regression analysis cancer had significantly higher prevalence rates compared to other health conditions and procedures. Kessler and colleagues found ranging PTSD prevalence rates (3-33%) in adults depending on the type of trauma (Kessler et al., 2014). They identified that violence in a relationship yielded the highest rates of PTSD. They found a prevalence rate of 30% for 'interpersonal-network traumatic experiences' which included life threatening illness of a child. Therefore similar prevalence rates have been found in previous research.

The significant trauma related risk factor estimates may assist in understanding why cancer diagnoses in the current meta-analysis yielded higher prevalence rates. For example length of hospital stay, condition length and relapse were all found to be important. Therefore those patients with cancer may have had longer hospital stays, have had the disease for longer and have higher chances of relapse. However, all these effects were small. The risk factor 'uncertainty around the illness' was found to be significant with a medium effect size. There are likely to be high rates of uncertainty around a cancer diagnosis compared to other disorders such as Type 1 Diabetes (T1D), epilepsy and asthma, in regards to survival and impact of treatment. Parental stress was a risk factor with a large effect. It may be that cancer diagnoses causes more stress in parents which is why prevalence rates were higher. The current meta-analysis and the research of Kessler highlight that the nature of the traumatic event is a salient factor to be considered for the development of PTSD.

The meta-analysis identified other important risk factors for parents developing PTSD. Of most importance was comorbid psychological functioning, including depressive and anxious symptoms as well as acute stress responses to the trauma and general psychological functioning. Comorbidities of PTSD with other psychological problems are common among adults and children (Brady, Killeen, Brewerton & Lucerini, 2000; Flory & Yehuda, 2015; Lewis et al., 2019). There are arguments that PTSD is better conceptualised as a general psychological reaction to trauma and may not be distinct from other psychological difficulties such as depressive features (Bodkin, Pope, Detke & Hudson, 2007). The current meta-analysis suggests that it is important to consider other aspects of psychological functioning, such as depression and anxiety, when assessing parents of children with medical trauma. Other psychological responses were measured alongside PTSD demonstrating that parents had multiple psychological reactions to the paediatric medical trauma. However critics of the diagnostic approach may describe the large correlations as a general psychological reaction to trauma (Spitzer, First & Wakefield, 2007).

Other psychological reactions such as stress were found to be a significant risk factor. Typically stress was measured using questionnaires, however one study used a biological marker of stress – cortisol (Greening, Stoppelbein & Cheek, 2017). Biological as well as psychological markers may be valuable for future research into potential risk factors for PTSD. However a previous meta-analysis suggested it is the subjective appraisal of the event which is important and not objective measures (Trickey, Siddaway, Meiser-Stedman, Serpell & Field, 2012), which is consistent with the cognitive model of PTSD (Ehlers & Clark, 2000). This meta-analysis found that perceived social support, peri-traumatic emotions and family functioning were significant risk factors. In the current meta-analysis social support and family functioning were found not to be statistically

significant. Emotional reactions to the trauma such as fear and worry (emotional reactions) were also found not to be statistically significant. Studies examining emotional responses were small ($k=4$) and assessments were not based on reliable and valid measures. More research into peri-traumatic reactions to medical trauma are warranted in future research using standardised measures with published psychometric properties.

Uncertainty was found to be a significant risk factor, with a medium effect size. Uncertainty was measured in five studies, with four using the Parent Perception of Uncertainty in illness Scale (PPUS; Mishel, 1983). Uncertainty is likely to be a subjective experience of the parent. In addition, irrespective of trauma type, uncertainty around the illness would be important to consider for the traumatic responses of wider systems of the child. This is likely to vary among medical traumas, however, it is the parents' perception of the uncertainty that is important to consider.

'Recovery' of the child (conceptualised as post-trauma quality of life and functioning) was found to be an important risk factor (approaching a medium effect, .29). This risk factor may be important for longer term PTSD. A child who is not recovering, i.e. they have poorer quality of life or the medical trauma has severely impacted their functioning, will likely, according to the current meta-analysis, impact on the parent's longer term traumatic stress responses. Behavioural difficulties of the child was also found to be an important risk factor, with the more difficulties experienced increasing the likelihood parents developing PTSD. Therefore in regards to screening potential families, these factors are important family factors to consider by clinicians.

It is important to take into account the high rates of heterogeneity across the prevalence rates and risk factors. Many factors are likely to have led to high levels of heterogeneity, including methodological differences, assessment methods, clinical and

medical traumatic factors. High levels of heterogeneity are likely to be found in meta-analyses (Engels, Schmid, Terrin, Olkin & Lau, 2000; Higgins, 2008), although this should be taken into account when interpreting the findings.

The findings from the present meta-analysis can be interpreted from the Paediatric Medical Traumatic Stress (PMTS) model (Kazak et al., 2006). Firstly, there is clearly traumatic stress responses from parents in regards to their child's medical trauma. These traumatic responses are also prevalent across certain medical traumas such as cancer. Although beyond the original aims of the meta-analysis, the findings can be understood from attachment (Bowlby, 1988) and evolutionary psychological perspectives (Bjorklund & Pellegrini, 2002). These theories in general terms postulate parents as protectors over their children. Circumstances which involve threat or harm to the child would cause stress. When this trauma event is out of the control of the parent, for example medical trauma, this would potentially lead to higher levels of stress in the parent. Secondly, the current meta-analysis found risk factors of both the child and parents that increase the likelihood of traumatic responses. These variables were found across the three phases of the PMTS model (Appendix F) and are all clinically important during assessment of PTSD.

Empirical Paper

The empirical research study sought to identify parents' and teachers' knowledge of PTSD presentations in children and adolescents. This study recruited two large samples (439 parents and 279 teachers) who completed an online questionnaire and selected what they believed to be traumatic events that could lead to PTSD, symptoms of PTSD in children and effective treatments offered by the National Health Service (NHS).

This study identified that parents and teachers are generally accurate when identifying symptoms of PTSD and traumatic events. However, it seemed that both groups

were broad in their endorsement of what a traumatic event is and symptoms of PTSD. Parental divorce or separation was categorised as a 'distractor' item in the present study, and the authors argued that this was an event that would not lead to PTSD in children. However both groups endorsed this event as traumatic that could lead to PTSD. Although the authors acknowledge this event can be distressing and certainly difficult to deal with from the child's perspective, it would not warrant a PTSD response according to Criterion A of the DSM-5 for PTSD (APA, 2013). We hypothesised that a child displaying psychological difficulties following this event would typically be diagnosed with an 'adjustment disorder' (APA, 2013). In addition many symptoms were endorsed that are not part of the diagnostic criteria for PTSD in the DSM-5 (APA, 2013). For example hearing voices to harm others, substance abuse and self-harm were all endorsed by approximately half of both parents and teachers. These may often co-occur with PTSD but they are not diagnostic features of the disorder according to the DSM-5 (APA, 2013).

Parents and teachers endorsed Trauma Focused Cognitive Behavioural Therapy (TF-CBT) for the treatment of PTSD in children but were rarely aware of Eye-Movement Desensitisation and Reprocessing (EMDR) interventions. However they would not necessarily need to know this information but be aware that they would need to seek medical support. Both groups endorsed other treatments which are not routinely offered by the NHS and not recommended in national clinical guidance for the treatment of PTSD in children (NICE, 2018) such as counselling, medication and therapy dogs.

Attitudes to the use of screening tools were also investigated. Generally both parents and teachers agreed or strongly agreed to their use, and this agreement increased if a traumatic event occurred in the local area. It is worth noting that there was a small proportion of the sample who disagreed or strongly disagreed with this notion. Participants

were not asked further questions regarding their attitudes to the screening tools and this would be important to understand in the future. It was encouraging that most parents would seek out additional information from health professionals (psychologist or GP). Many parents stated they would use the internet to find out more information on childhood PTSD which has implications on how to provide information to parents as well as teachers and other key adults in regards to PTSD and possibly mental health in general.

The meta-analysis (Chapter 2) demonstrated that parents can experience traumatic responses to their child's trauma. The meta-analysis highlighted that 'child trauma' can encompass a child receiving a medical diagnosis such as cancer. Therefore parents can develop PTSD and symptoms of PTSD when their child experiences a medical trauma, including being diagnosed with a medical condition. The empirical paper (Chapter 4) found that key adults in the child's life seem aware of traumatic events and symptoms, although this awareness seems broad. It would be important to ensure accurate information is provided to adults in regards to PTSD in children and adolescents in an accessible way based on where parents seek health related information. Both the meta-analysis and empirical paper will now be critically evaluated and their clinical implications explored in more detail.

Critical Evaluation

Both studies provide further information to the area of child PTSD and trauma. Additionally they have provided new information and data regarding trauma from a systemic perspective and the understanding of PTSD among parents and teachers. The meta-analysis is a strength as it took data from 54 studies and used weighted pooled prevalence and risk factor estimates. A total of 33 risk factors were considered which we felt to be a substantial amount. The quality of the studies were assessed diligently and appropriate sensitivity analyses conducted to account for any bias. The empirical paper

recruited large samples which provides a good estimate of the sample's understanding of PTSD in children. It is, to the authors' knowledge, the first study to assess PTSD knowledge of parents and teachers in regards to PTSD in children and adolescents. Several limitations of both studies should be considered when interpreting the findings. These limitations highlight that the results may not be generalisable to wider populations and therefore caution should be taken.

Although the meta-analysis involved a thorough search of potential research articles across three databases, no grey literature was sought and therefore some unpublished data may not have been included. However as this was not a treatment meta-analysis we felt that this would not have a significant impact on the outcome. Secondly, very stringent exclusion criteria was applied to the set of studies identified. This was for two reasons; firstly, to fully operationalise the medical trauma being investigated and secondly due to time constraints of completing the doctoral thesis. Certain medical traumas were clearly excluded such as studies involving medical traumas during pregnancy and those that studied traumas resulting in the death of the child. In addition studies that only investigated depressive responses to paediatric trauma were excluded. It is important that the psychological impact on parents in these situations are researched and multiple psychological reactions considered from a meta-analytic perspective.

The empirical research project used a researcher-developed tool to measure PTSD knowledge. We felt this methodology enabled us to specifically target certain features of the PTSD diagnostic criteria and treatments. It is unknown if other methodologies would result in similar findings and therefore different methodological approaches should be considered in the future. This could involve true/false responses to PTSD knowledge questions or the use of clinical vignettes. We were cautious about increasing the burden to

participants in the study and therefore did not opt for a more complex methodology. As a result, a large sample of parents and teachers were recruited and information on their understanding of PTSD in children was explored. All responses were based on self-report and therefore some inaccuracies or demand characteristics of participants could be present.

The recruitment procedure involved individually contacting schools. School lists were randomised and covered three counties in the East of England. However recruitment procedures of contacting local authorities, who oversee all public schools in England, could have been used. This may have led to higher response rates of schools. Social media was used to recruit additional teachers, however not all teachers use social media and therefore this could have skewed the results.

Clinical implications

Findings from both studies have several clinical implications in regards to service delivery and development. The high prevalence rates of parental PTSD have implications for psychological services and the need to screen families experiencing trauma. Within an acute hospital setting, the primary focus will naturally be the paediatric condition (such as cancer or diabetes). Therefore this research highlights that psychological difficulties and distress should be considered by clinical teams. Within the Health and Social Care Act (2012) and the parity of esteem legislation of the UK government which highlights that mental and physical health should be equal and treated alongside each other (Department of Health, 2011). The meta-analysis highlights that psychological responses to physical health conditions are common.

Early identification of those families would be important. The current research highlights that certain families or parents are more likely to develop traumatic responses. Those factors should be considered and assessed for during the screening process. As

found in the empirical paper, parents are generally in agreement for children to be screened for PTSD in schools. It could therefore be assumed parents would agree to screening in hospitals following trauma, although this was not researched in the current research. Untreated PTSD in both parents and children have serious clinical and economic costs to the individual living with the debilitating condition and increased costs to a healthcare system with limited resources.

Both parents and teachers have an understanding of traumatic events and PTSD symptoms but this was broad and included many items the researchers conceptualised as 'distractors'. Public health initiatives would be important in improving the recognition of PTSD in children and adolescents by key adults. This is particularly important due to the current and unpredictable international political climate. Recently, two major terror attacks have occurred in the UK, that of the Westminster Bridge attack and the Manchester arena bombing. In addition, the horrific Grenfell Tower fire was a major traumatic event in London. All three of these incidents included children and adolescents. This highlights how important it is for adults to recognise trauma responses in children. Public health initiatives could focus on schools and target both parents and teachers. Many schools are adopting a trauma-informed approach (Sweeney, Clement, Filson & Kennedy, 2016) however we found that many teachers had not received training on PTSD or trauma. Evidence suggests teachers want more trauma training (Moon, Williford & Mendenhall, 2017). We found that not many parents utilise the school as a source of knowledge for such conditions and would typically go to the internet or health professionals (such as a GP or a psychologist). There is a myriad of information available on the internet and therefore it is paramount this information is accurate and easily accessible.

Future Research

In regards to parental traumatic stress responses following paediatric medical trauma, it would be important for future research to investigate certain trauma types excluded from the current meta-analysis, such as traumas during pregnancy and those resulting in child death. A meta-analysis of these traumas would be clinically valuable. There are many paediatric medical traumas that were not featured in the current meta-analysis. Other chronic conditions would warrant further investigation from a systemic perspective of trauma responses, for example cystic fibrosis, HIV and food allergies. All of these conditions can have serious complications if not appropriately treated and could cause traumatic responses within the parent. In addition, the PMTS model highlights that the majority of research looks at the parental response to paediatric medical trauma (Kazak et al., 2006). It is important to understand the wider systemic response to trauma. Of particular interest would be siblings, grandparents and other primary caregivers. Furthermore, there is suggestions that peers and wider systems such as schools can have traumatic stress responses to trauma and therefore important to investigate further.

Although the empirical paper investigated adults' knowledge of PTSD, knowledge of the child is important to understand too. Although it may be difficult to ascertain younger children's understanding of PTSD, it would be important to investigate the knowledge of adolescents. Many adolescents will self-refer to services or attend GP appointments alone. Therefore it is paramount clinicians and academics understand if adolescents would recognise PTSD and where they access sources of knowledge and help. Further research into the facilitators and barriers to screening for PTSD in schools would be valuable. Finally, the present research did not investigate how knowledge impacts on help-seeking behaviours.

Reflections

During the recruitment of schools, I was struck by the amount of schools that did not want to take part in the project due to concerns of how parents would respond to the project. A handful of head teachers were concerned that parents may find it emotionally difficult to complete and would not want to risk this. This could have happened within the present research, especially if the parent had previous trauma or concurrent PTSD. However we felt that the ethical considerations to this were covered and clear information of what participants should do if they had such a reaction were provided. Research has found that participants tend to find the experience of being involved in psychological research as a positive one and not distressing (Jorm, Kelly & Morgan, 2007). Indeed, in the current research two participants contacted the lead investigator to share their stories of living with PTSD. They were not distressed by the research, yet valued that this work was going ahead. Encouragingly, many schools valued the research and were keen to take part. A couple of the schools declared that they had been involved with trauma training and they were very open to talking and discussing mental health. One school were keen to have training from the lead investigator about trauma and responding to mental health difficulties within schools, which was delivered once all data analysis had been completed. Variations in the approach to mental health and how mental health is talked about was evident from an anecdotal point of view from the lead investigator which could be interesting to research in the future.

Overall conclusions

The meta-analysis outlined in Chapter 2 provided a pooled estimate prevalence rate for parents developing PTSD following paediatric medical traumas. From moderator analysis it was found that cancer diagnosis resulted in the highest rates of PTSD in parents compared to other medical traumas. A number of significant and large effects were found

regarding risk factors for parents developing PTSD. These can be clinically informative for professionals working with families experiencing paediatric medical trauma. Adult gatekeepers (parents and teachers) to children's health generally recognised traumatic events and symptoms of PTSD. However these gatekeepers also seemed to have a broad understanding of what events they considered traumatic and the symptoms associated with the diagnostic criteria of PTSD. This is important as key adults need to be able to recognise PTSD in children and facilitate appropriate help seeking behaviour. Although TF-CBT was recognised as an effective treatment, many interventions were selected by participants that lack evidence to their effectiveness, such as therapy dogs and medication. EMDR was not recognised by participants as an effective treatment for children and adolescents experiencing PTSD. General agreement was identified for the use of screening measures used in schools to screen for PTSD. These two research articles further the knowledge of adult trauma responses to child health conditions and knowledge of PTSD in children and adolescents.

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Appendices

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Appendix B: Quality Checklist for Prevalence and Risk Factor Meta-Analysis**Quality Checklist for Prevalence and Risk Factor Meta-Analysis**

Well addressed = 2

Partially addressed = 1

Poorly addressed/not addressed/not reported = 0

Assessed by:	
Section 1: Population	
1.1 Were participants and setting well described?	
Information regarding the characteristics (age, gender, ethnicity) of the sample and trauma variables (type, severity, duration) are well described with the setting well reported (health setting, country, geography)	2
Some information regarding participants characteristics and trauma variables are reported, with limited information on the setting	1
Sample characteristics, trauma variables and setting information are not reported in any detail	0
1.2 Was participation rate of those eligible at least 50%?	
More than 50% of those eligible to participate took part	2
Less than 50% of those eligible to participate took part	1
The number of eligible potential participants was not reported	0
1.3 Were reasons for non-response described?	
Reasons for non-response were described with the number of those participants not responding reported	2
Reasons were described for non-responders but no numbers provided OR Numbers of non-responders are reported but with no reasons	1
Non-response rates were not reported in the study	0
1.4 Was the sample representative – were there differences between those participants taking part and those not?	
There were no significant differences in demographics or trauma variables between those participating and those not	2
Reported significant differences between those participating and those not	1
Differences between participants and those not taking part were not reported	0
1.5 Were participants recruited in an appropriate way?	
Consecutive or random sampling was used to recruit potential participants in person by the research team	2
Consecutive or random sampling was used to recruit potential participants via letter or phone call	1
Recruitment procedures were not reported in the study	0

1.6 Were inclusion and exclusion criteria explicit and appropriate?	
Inclusion and exclusion criteria were reported in detail with a clear rationale	2
Some information on inclusion and exclusion criteria were reported but lacked a rationale	1
Inclusion and exclusion criteria were not reported	0
Section 2: Outcomes	
2.1 Was objective, standardised criteria used for the assessment of PTSD?	
A diagnostic interview was used which demonstrated good levels of reliability and validity in assessment of PTSD in parents, adhering to DSM-III, DSM-IV or DSM-5 criteria for PTSD	2
A self-report questionnaire used which demonstrated good levels of reliability and validity in the assessment of PTSD in parents, adhering to DSM-III, DSM-IV or DSM-5 criteria for PTSD	1
An observer-rated questionnaire/interview, self-report questionnaire without using DSM criteria, generic clinical interview was used, or measures used demonstrated poor reliability and/or validity	0
2.2 Were risk factors assessed using reliable and valid measures	
Risk factors for developing PTSD were assessed using a structured clinical interview or extracted from medical records (e.g. demographics, trauma related variables) or based on the physician/doctor/other professional	2
Risk factors for developing PTSD were assessed using reliable and validated self/parent-report outcome measures (including parent report of medical severity)	1
Risk factors were not based on reliable or valid measures	0
2.3 Was PTSD (and risk factors) assessed appropriately (professional and setting)?	
Assessment was carried out in person by an appropriately trained professional (e.g. clinical psychologist, psychiatrist, research nurse, trainee psychologist, psychological therapist, research assistant) at the most convenient location (e.g. participant's home if discharged from hospital). Or if self-report measures were used, they were administered by a trained professional to participants or participants had the opportunity to ask questions or speak with a trained professional.	2
Assessment was carried out by a trained professional over the phone AND/OR child factors were assessed by proxy (e.g. parent). Or if self-report measures were used participants had the opportunity to speak with a trained/clinical professional over the phone.	1
Assessment was indirect (through other health care professionals) or participants had no opportunity to discuss self-report measures with a trained/clinical professional. OR information regarding location and person assessing PTSD and risk factors were not reported.	0
2.4 Was follow-up time for PTSD assessment appropriate and meaningful?	
An appropriate time frame (>4 weeks post trauma) was used when assessing for PTSD	2
PTSD assessment was undertaken >6 months post trauma	1
No information regarding time frame used when assessing PTSD was reported	0
Section 3: Analyses	

3.1 Was the sample size adequate?	
Sample size was adequate to detect prevalence and risk factors which was based on a sample size or power calculation (or based on consideration of previous studies)	2
Sample size was adequate without reference to sample size calculations or consideration of previous studies	1
Same size justification was not reported, or sample size was too small	0
3.2 Was there appropriate statistical analysis used	
Statistical methods used for analysis were appropriate, with confidence intervals at 95% reported for estimate	2
Statistical methods used for analysis were appropriate, but no confidence intervals were reported	1
Statistical methods used were inappropriate or the study lacked information on statistical methodology when reporting data	0
Overall Risk of Bias	/24

Low risk of bias **17 -24**

Moderate risk of bias **9 - 16**

High risk of bias **0 - 8**

This tool was developed by Mr Aaron Burgess and Miss Lucy Wilcoxon for a meta-analysis undertaken in partial fulfilment of a doctorate in clinical psychology. The development of this tool was based on previous quality checks and research (National Heart Lung and Blood Institute, 2014; NICE, 2012; Hoy et al., 2012; Munn, Moola, Riitana & Lisy, 2014).

Appendix C: Individual scores per study on the quality check

Table A.1. Individual quality assessments for each question across all studies.

Study	Risk of bias criteria												Score /24
	1	2	3	4	5	6	7	8	9	10	11	12	
Balluffi et al. (2004)	Yellow	Green	Yellow	Red	Green	Yellow	Yellow	Yellow	Red	Green	Green	Green	15
Binder et al. (2011)	Yellow	Red	Red	Red	Red	Yellow	Yellow	Yellow	Green	Green	Red	Red	8
Bronner et al. (2008)	Yellow	Green	Green	Green	Yellow	Green	Yellow	Green	Green	Green	Yellow	Green	20
Bruce et al. (2010)	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	12
Carmassi et al. (2017)	Green	Green	Red	Red	Red	Yellow	Green	White	Red	Red	Yellow	Yellow	11
Farley et al. (2007)	Yellow	Green	Green	Red	Green	Yellow	Yellow	Yellow	Green	Yellow	Yellow	Yellow	15
Forinder & Norberg (2017)	Light Green	Green	Red	Red	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Light Green	12
Franck et al. (2015)	Green	Green	Green	Red	Green	Yellow	Yellow	Yellow	Green	Green	Green	Yellow	18
Fuemmeler et al. (2001)	Green	Green	Yellow	Red	Yellow	Red	Yellow	Yellow	Red	Yellow	Red	Yellow	10
Fuemmeler et al. (2005)	Yellow	Yellow	Red	Red	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	10
Gizli Çoban et al. (2017)	Green	Green	Green	Red	Green	Yellow	Yellow	Green	Green	Yellow	Red	Yellow	16
Greening et al., (2017)	Green	Green	Green	Red	Green	Green	Yellow	Yellow	Green	Yellow	Green	Yellow	19
Gudmundsdóttir et al. (2006)	Light Green	Yellow	Yellow	Yellow	Yellow	Red	Red	Yellow	Red	Yellow	Yellow	Yellow	9.5
Hardy et al. (2008)	Green	Yellow	Yellow	Yellow	Red	Red	Yellow	Yellow	Yellow	Yellow	Red	Yellow	10
Hofmann et al. (2007)	Yellow	Red	Red	Red	Red	Red	Green	Yellow	Red	Yellow	Red	Yellow	6
Iranmanesh et al. (2015)	Green	Green	Yellow	Red	Red	Yellow	Yellow	Green	Green	Yellow	Yellow	Green	14
Karadeniz Cerit et al. (2017)	Green	Green	Yellow	Red	Red	Yellow	Green	Green	Green	Yellow	Yellow	Yellow	15
Kean et al. (2006)	Green	Red	Red	Red	Red	Red	Yellow	Yellow	Green	Red	Yellow	Yellow	8
Kubota et al. (2016)	Yellow	Green	Green	Red	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	13
Landolt et al. (1998)	Green	Green	Yellow	Red	Green	Yellow	Yellow	Green	Green	Green	Red	Yellow	15
Landolt et al. (2002)	Green	Green	Green	Red	Green	Yellow	Yellow	Green	Yellow	Green	Yellow	Yellow	17
Landolt et al. (2003)	Green	Green	Red	Red	Green	Yellow	Yellow	Green	Yellow	Green	Yellow	Yellow	16
Landolt et al. (2005)	Green	Green	Green	Green	Green	Yellow	Yellow	Green	Yellow	Green	Yellow	Yellow	19
Landolt et al. (2012)	Yellow	Green	Green	Green	Green	Yellow	Yellow	Green	Red	Green	Yellow	Yellow	17
Lefkowitz (2010)	Green	Yellow	Green	Yellow	Green	Yellow	Yellow	Yellow	Red	Green	Yellow	Yellow	16
Lewis et al. (2014)	Green	Yellow	Green	Yellow	Green	Green	Yellow	Yellow	Red	Yellow	Green	Yellow	14

Magal-Vardi et al. (2004)	0.5	0	0	0	0	0.5	0.5	1.5	0	0.5	0	0.5	8
Masa'deh & Jarrah (2017)	1.5	1.5	0	0	0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	14
McCarthy et al. (2012)	1.5	1.5	0	0	0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	16
Naderi et al. (2012)	0	0	0	0	0	0	0	0	0	0	0	0	7
Nakajima-Yamaguchi et al. (2016)	1.5	1.5	0	0	0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	10
Norberg & Boman (2008)	0	0	0	0	0	0	0	0	0	0	0	0	11
Norberg et al. (2005)	0.5	0.5	0	0	0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	10
Okado et al. (2016)	1.5	1.5	0	0	0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	14
Pasterski et al. (2014)	0.5	0	0	0	0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	10
Pelcovitz et al. (1996)	1.5	1.5	0	0	0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	17
Phipps et al. (2005)	0.5	0.5	0	0	0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	10
Pierce et al. (2017)	1.5	1.5	0	0	0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	17
Poder et al. (2008)	1.5	1.5	0	0	0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	17
Rees et al. (2004)	0.5	0.5	0	0	0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	16
Ribi et al. (2007)	1.5	1.5	0	0	0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	13
Rodriguez-Rey & Alsonso-Tapia (2017)	1.5	1.5	0	0	0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	13
Santacroce (2002)	1.5	1.5	0	0	0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	17
Shears et al. (2005)	0.5	0	0	0	0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	13
Shi et al. (2017)	1.5	1.5	0	0	0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	18
Stoppelbein & Greening (2007)	1.5	1.5	0	0	0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	17
Stuber et al. (1996)	0.5	0	0	0	0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	12
Tackett et al. (2016)	0.5	0	0	0	0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	14
Taskiran et al. (2016)	1.5	1.5	0	0	0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	16
Tremolada et al. (2013)	1.5	1.5	0	0	0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	17
Vernon et al. (2017)	0	0	0	0	0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	12

Key: 0 0.5 1 1.5 2 N/A

Appendix D: Individual effect sizes extracted from studies in meta-analysis**Table A.2. Risk factors extracted from included studies and descriptive statistics for overall effect sizes from each study**

Risk Factor	Study	Assessment of Risk Factor	<i>K</i>	Mean <i>r</i>	Min.	Max.
Parent's ASD	Balluffi et al. (2004)	Acute Stress Disorder Scale (ASDS)	1	0.62		
	Lefkowitz (2010)	Acute Stress Disorder Scale (ASDS)	1	0.62		
	McCarthy et al. (2012)	Acute Stress Disorder Scale (ASDS)	1	0.71		
Behavioural difficulties (child)	Hofmann et al. (2007)	Child Behaviour Checklist (CBCL)	1	0		
	Kubota et al. (2016)	Child Behaviour Checklist (CBCL)	1	0.37		
	Nakajima-Yamaguchi et al. (2016)	Child Behaviour Checklist (CBCL)	1	0.60		
Child age	Shears et al. (2005)	The Strengths and Difficulties Questionnaire (SDQ)	2	0.17	0.07	0.26
	Balluffi et al. (2004)	Standard demographic information	1	0		
	Bronner et al. (2008)	Standard demographic information	2	0.01	0.01	0.02
	Bruce et al. (2010)	Standard demographic information	2	0.16	0.11	0.21
	Franck et al. (2015)	Standard demographic information	1	0		
	Gudmundsdóttir et al. (2006)	Standard demographic information	2	-0.06	-0.18	0.07
	Hardy et al. (2008)	Standard demographic information	1	0		
	Iranmanesh et al. (2015)	Standard demographic information	1	0.01		
	Karadeniz Cerit et al. (2017)	Standard demographic information	1	0.15		
	Landolt et al. (1998)	Standard demographic information	1	-0.07		
	Landolt et al. (2002)	Standard demographic information	1	0		
	Landolt et al. (2003)	Standard demographic information	2	0.01	-0.02	0.05
	Landolt et al. (2005)	Standard demographic information	2	0.09	-0.06	0.23
	Nakajima-Yamaguchi et al. (2016)	Standard demographic information	2	-0.25	-0.29	-0.20
	Okado et al. (2016)	Standard demographic information	1	0.21		
	Pasterski et al. (2014)	Standard demographic information	1	-0.28		
	Pelcovitz et al. (1996)	Standard demographic information	1	0		
	Pierce et al. (2017)	Standard demographic information	1	-0.15		
	Stuber et al. (1996)	Standard demographic information	1	-0.01		
	Coping strategies	Bruce et al. (2010)	Miller Behavioural Style Scale (MBSS) – seeking out medical information	1	-0.18	
Franck et al. (2015)		Brief COPE – active and social support	2	-0.03	-0.07	0.01

(positive)	Ribi et al. (2007)	Brief COPE – functional	1	0.51		
Coping	Bruce et al. (2010)	Miller Behavioural Style Scale (MBSS) – avoidance	1	-0.02		
strategies	Franck et al. (2015)	Brief COPE – negative, disengagement/substance abuse	2	0.25	0.14	0.35
(negative)	Fuemmeler et al. (2001)	Ways of Coping questionnaire (WOC; emotion-focused subscale)	1	0.4		
	Fuemmeler et al. (2005)	Ways of Coping questionnaire (WOC; emotion-focused subscale)	1	0.29		
	Gudmundsdóttir et al. (2006)	Coping Style Questionnaire (CSQ)	2	0.57	0.36	0.73
	Ribi et al. (2007)	Brief COPE – functional	1	0.51		
Depressive	Hofmann et al. (2007)	Child Depression Inventory (CDI)	1	0		
symptoms	Okado et al. (2016)	Child Depression Inventory (CDI)	1	0.07		
(Child)						
Emotional	Balluffi et al. (2004)	Researcher developed Likert-style question: worry that child may die	1	0.28		
states (parents)	Pasterski et al. (2014)	Researcher developed – emotional index (shock, shame, anger, guilt, grief and relief)	1	-0.27		
	Nakajima-Yamaguchi et al. (2016)	Parent Experience of Child Illness (PECI) – guilt and worry subscale	1	0.52		
	Rees et al. (2004)	Researcher developed question – fear child may die	1	0.49		
Ethnicity (non-	Balluffi et al. (2004)	Standard demographic information	1	0.28		
white)	Franck et al. (2015)	Standard demographic information	1	0		
	Greening et al. (2017)	Standard demographic information	1	-0.07		
	Hardy et al. (2008)	Standard demographic information	1	0		
	Lefkowitz (2010)	Standard demographic information	1	0.17		
Financial	Gudmundsdóttir et al. (2006)	Researcher developed questionnaire	1	0.51		
burden	Franck et al. (2015)	Medical records/parent questionnaire (hospital distance from family home)	1	0		
	Karadeniz Cerit et al. (2017)	Clinical Data Form (financial loss)	1	-0.07*		
	Kubota et al. (2016)	Feelings of economic burden	1	0.45		
	Taskiran et al. (2016)	Interview with parents (parents having to rent flat to be close to hospital)	1	0		
Parental	Forinder & Norberg (2014)	Depression subscale of Hospital Anxiety and Depression Scale (HADS)	1	0.78		
depressive	Franck et al. (2015)	Depression subscale of Hospital Anxiety and Depression Scale (HADS)	1	0.27		
symptoms	Greening et al. (2017)	Beck Depression Inventory Second edition (BDI-2)	1	0.74		
	Hofmann et al. (2007)	Beck Depression Inventory Second edition (BDI-2)	1	0		
	Karadeniz Cerit et al. (2017)	Depression subscale of Hospital Anxiety and Depression Scale (HADS)	1	0.43		
	Lefkowitz (2010)	Postpartum Depression Screening Scale (PDSS)	1	0.82		

	Lewis et al. (2014)	Depression subscale of Hospital Anxiety and Depression Scale (HADS)	1	0.56			
	Norberg & Boman (2008)	Zung Self-Rating Depression (ZSRD) scale	1	0.58			
	Okado et al. (2016)	Depression subscale of Brief Symptom Inventory (BSI)	1	0.49			
	Rodriguez-Rey & Alsonso-Tapia (2017)	Depression subscale of Hospital Anxiety and Depression Scale (HADS)	1	0.68			
	Shi et al. (2017)	Patient Health Questionnaire (PHQ-9)	1	0.78			
	Stoppelbein & Greening (2007)	Beck Depression Inventory Second edition (BDI-2)	1	0.34			
Illness severity	Ballufi et al. (2004)	Pediatric Risk of Mortality (PRISM-III)	1	0			
	Binder et al. (2011)	Score for Neonatal Acute Physiology, Perinatal Extension 2 (SNAPPE); Perinatal Risk Inventory (PERI)	4	0.15	-0.01	0.32	
	Bronner et al. (2008)	Paediatric Index of Mortality (PIM2)	2	0.01	0.003	0.006	
	Farley et al. (2007)	Pediatric Transplant Side Effect Severity Scale (SESS)	1	0.02			
	Lefkowitz (2010)	Researcher developed scale/question	2	0.01	-0.11	0.13	
	Kean et al. (2006)	Rosier Functional Asthma Severity Scale	1	0.07			
	Nakajima-Yamaguchi et al. (2016)	Intensity Treatment Rating 3.0 (ITR-3.0)	1	0.43			
	Okado et al. (2016)		1	0			
	Pelcovitz et al. (1996)	Clinician categorical rating	1	0			
	Pierce et al. (2017)	Intensity of Treatment Scale					
	Rees et al. (2004)	Researcher developed scale/question	1	0.47			
	Rodriguez-Rey & Alsonso-Tapia (2017)	Paediatric Index of Mortality (PIM2); Researcher developed scale/question	2	0.05	-0.05	0.15	
	Length of hospital stay	Ballufi et al. (2004)	Parent report	1	0		
		Bronner et al. (2008)	Medical notes	2	0.01	0.01	0.01
Bruce et al. (2010)		Patient information database	1	0.21			
Franck et al. (2015)		Patient questionnaire/medical records	1	0.25			
Gudmundsdóttir et al. (2006)		Researcher developed scale	1	0.40			
Karadeniz Cerit et al. (2017)		Clinical Data Form	1	0.34			
Kubota et al. (2016)		Interview with parent	1	0.1			
Landolt et al. (1998)		Patient records	1	0.34			
Landolt et al. (2002)		Patient records	2	0.17	0	0.34	
Landolt et al. (2003)		Patient records	2	0.30	0.26	0.34	

Gender (mother)	Lefkowitz (2010)	Medical records	1	-0.13		
	Nakajima-Yamaguchi et al. (2016)	Patient records	1	0.15		
	Rees et al. (2004)	Hospital records / semi-structured interview	1	0.49		
	Shears et al. (2005)	Researcher-developed questionnaire	2	0.24	0	0.41
	Taskiran et al. (2016)	Interview	1	0		
	Balluffi et al. (2004)	Standard demographic information	1	0.47		
	Binder et al. (2011)	Standard demographic information	1	0.30		
	Bronner et al. (2011)	Standard demographic information	1	0.15		
	Franck et al. (2015)	Standard demographic information	1	0		
	Fuemmeler et al. (2005)	Standard demographic information	1	0.01		
	Gudmundsdóttir et al. (2006)	Standard demographic information	1	0.11		
	Hardy et al. (2008)	Standard demographic information	1	0		
	Iranmanesh et al. (2015)	Standard demographic information	1	0.25		
	Landolt et al. (2002)	Standard demographic information	1	0.12*		
	Landolt et al. (2012)	Standard demographic information	1	0.22		
	Masa'deh & Jarrah (2017)	Standard demographic information	1	0.54		
	McCarthy et al. (2012)	Standard demographic information	1	0.18		
	Naderi et al. (2012)	Standard demographic information	1	0.41		
	Pasterski et al. (2014)	Standard demographic information	1	0.23		
	Gender (boy/male) - child	Phipps et al. (2005)	Standard demographic information	1	0.21	
Poder et al. (2008)		Standard demographic information	1	0.16		
Shi et al. (2017)		Standard demographic information	1	0.11		
Balluffi et al. (2004)		Standard demographic information	1	0		
Bronner et al. (2011)		Standard demographic information	2	-0.07*	0.02	0.12
Franck et al. (2015)		Standard demographic information	1	0		
Hardy et al. (2008)		Standard demographic information	1	0		
Iranmanesh et al. (2015)		Standard demographic information	1	0.13		
Karadeniz Cerit et al. (2017)		Standard demographic information	1	-0.23*		
Landolt et al. (1998)		Standard demographic information	1	-0.04*		
Landolt et al. (2002)	Standard demographic information	1	0			
Landolt et al. (2003)	Standard demographic information	2	0.09*	-0.07	-0.11	

General distress (parents)	Landolt et al. (2005)	Standard demographic information	2	0.18*	-0.12	-0.24
	Masa'deh & Jarrah (2017)	Standard demographic information	1	0		
	Naderi et al. (2012)	Standard demographic information	1	0.01		
	Nakajima-Yamaguchi et al. (2016)	Standard demographic information	1	-0.44		
	Shi et al. (2017)	Standard demographic information	1	-0.01*		
	Binder et al. (2011)	Brief Symptom Inventory (BSI-18)	1	0		
	Farley et al. (2007)	Distress subscale of Paediatric Inventory for Parents (PIP)	2	0.66	0.64	0.67
	Gudmundsdóttir et al. (2006)	Trauma Symptom Checklist (TSC) and Impact on Family Scale (IFS)	2	0.74*	0.7	0.78
	Karadeniz Cerit et al. (2017)	Hospital Anxiety and Depression Scale (HADS)	1	0.48		
	Lewis et al. (2014)	Hospital Anxiety and Depression Scale (HADS)	1	0.55		
	Nakajima-Yamaguchi et al. (2016)	Parent Experience of Child Illness (PECI)	4	0.23	-0.25	0.52
	Okado et al. (2016)	Brief Symptom Inventory (BSI)	1	0.63		
	Pelcovitz et al. (1996)	Symptom Checklist-90-R (SCL-90-R)	1	0		
	Poder et al. (2008)	Global Distress and Psychological Symptoms subscales of the Memorial Symptoms Assessment Scale (MSAS)	2	0.44	0.43	0.44
History of psychiatric treatment/diagnosis	Shears et al. (2005)	General Health Questionnaire (GHQ)	1	0.50		
	Tackett et al. (2016)	Brief Symptom Inventory (BSI)	1	0.69		
	Karadeniz Cerit et al. (2017)	Clinical Data Form	1	-0.41*		
	Lefkowitz (2010)	Self-report, researcher developed questionnaire	1	0.43		
Medical complications	Binder et al. (2011)	Self-report (gestational age of baby and birth weight)	4	0.10*	-0.18	-0.01
	Bronner et al. (2008)	Self-report combining use of artificial ventilation, circulatory support and neuromuscular blocking agents	6	0.13	0.05	0.37
Parent age	Nakajima-Yamaguchi et al. (2016)	Physician rated/medical records	1	0.17		
	Fuemmeler et al. (2001)	Standard demographic information	1	-0.42		
	Fuemmeler et al. (2005)	Standard demographic information	1	-0.28		
	Gizli Çoban et al. (2017)	Standard demographic information	1	0		
	Gudmundsdóttir et al. (2006)	Standard demographic information	1	-0.11		
	Hardy et al. (2008)	Standard demographic information	1	0		
	Iranmanesh et al. (2015)	Standard demographic information	1	0.01		

Parental anxious symptoms	Karadeniz Cerit et al. (2017)	Standard demographic information	1	-0.06			
	Lefkowitz (2010)	Standard demographic information	1	0.07			
	Masa'deh & Jarrah (2017)	Standard demographic information	1	-0.68			
	Nakajima-Yamaguchi et al. (2016)	Standard demographic information	1	-0.27			
	Taskiran et al. (2016)	Standard demographic information	1	0			
	Forinder & Norberg (2014)	Hospital Anxiety and Depression Scale (HADS; anxiety subscale)	1	0.79			
	Franck et al. (2015)	Hospital Anxiety and Depression Scale (HADS; anxiety subscale)	1	0.49			
	Greening et al. (2017)	State-Trait Anxiety Inventory (STAI)	2	0.73	0.72	0.74	
	Hofmann et al. (2007)	State-Trait Anxiety Inventory Y form (STAI-Y)	1	0			
	Karadeniz Cerit et al. (2017)	Hospital Anxiety and Depression Scale (HADS; anxiety subscale)	1	0.35			
Partner PTSD	Lewis et al. (2014)	Hospital Anxiety and Depression Scale (HADS; anxiety subscale)	1	0.54			
	Norberg & Boman (2008)	State-Trait Anxiety Inventory (STAI)	1	0.59			
	Okado et al. (2016)	Brief Symptom Inventory (BSI) anxiety subscale	1	0.54			
	Rodriguez-Rey & Alsonso-Tapia (2017)	Hospital Anxiety and Depression Scale (HADS; anxiety subscale)	1	0.67			
	Santacroce (2002)	State-Trait Anxiety Inventory (STAI)	1	0.56			
	Stoppelbein & Greening (2007)	State-Trait Anxiety Inventory (STAI)	1	0.32			
	Bronner et al. (2008)	The Self-Rating Scale for PTSD (SRS-PTSD)	1	0.65			
	Stuber et al. (1996)	PTSD Reaction Index (PTSD-RI)	1	0.41			
	Perceived social support	Franck et al. (2015)	Duke-UNC functional social support questionnaire	1	0		
		Fuemmeler et al. (2005)	The Social Network Reciprocity and Dimensionality Assessment Tool	1	-0.15		
Gudmundsdóttir et al. (2006)		Crisis Support Scale (CSS)	2	-0.18	-0.21	-0.14	
Karadeniz Cerit et al. (2017)		Clinical Data Form	2	-0.03	-0.14	0.07	
Kubota et al. (2016)		Single question (satisfaction with father's help)	1	-0.35			
Poor family functioning	Pelcovitz et al. (1996)	Researcher developed tool	1	0			
	Nakajima-Yamaguchi et al. (2016)	Single question (close friends of child)	1	-0.4			
	Bruce et al. (2010)	The Parent-Child Interaction Questionnaire-Revised Parent version (PACHIQ-R-P)	3	0.12*	-0.29	0.1	
	Franck et al. (2015)	Family Environment Scale (FES)	1	0			
Lewis et al. (2014)	Family Assessment Device (FAD)	7	0.37	0.31	0.45		

	Ribi et al. (2007)	Family Relationships Inventory (FRI)	1	-0.02*		
	Shi et al. (2017)	Family Assessment Device (FAD) subscale	1	0.33		
PTG	Forinder & Norberg (2014)	Post-Traumatic Growth Inventory (PTGI)	3	0.10	0	0.23
	Rodriguez-Rey & Alsonso-Tapia (2017)	Post-Traumatic Growth Inventory (PTGI)	1	0.28		
Previous trauma / life events	Franck et al. (2015)	Researcher developed parental questionnaire	2		0	0.19
	Greening et al. (2017)	Life Events Checklist (LEC)	1	0.21		
	Karadeniz Cerit et al. (2017)	Researcher developed questionnaire	1	0.28		
	Landolt et al. (2003)	Researcher developed scale (proceeding life events)	2	0.06	-0.04	0.15
	Landolt et al. (2005)	Researcher developed scale (life events)	2	0.09	0.02	0.15
	Pelcovitz et al. (1996)	Potential stressful events interview	2	0.54	0	0.84
	Stoppelbein & Greening (2007)	Life Events Checklist (LEC) adapted	1	0.21		
	Tremolada et al. (2013)	Problem Scale, Ladder of life and an in-depth interview (EFI-C)	1	0.3		
Prior hospital admissions	Balluffi et al. (2004)	Researcher developed self-report scale	1	0		
	Franck et al. (2015)	Researcher developed parental questionnaire	1	0.19		
PTSD/PTSS (child self-report)	Hofmann et al. (2007)	Structured Clinical Interview for Diagnosis (SCID)	1	0		
	Landolt et al. (2003)	Child PTSD reaction index (CPTSD-RI)	2	0.01	-0.01	0.02
	Magal-Vardi et al. (2004)	Child PTSD reaction index (CPTSD-RI)	2	0.32	0	0.63
	Okado et al. (2016)	UCLA Post traumatic Stress Reaction Index (PTSDI)	1	0.16		
	Phipps et al. (2005)	PTSD-I and Impact of Events Scale-Revised (IES-R)	2	0.39	0.31	0.48
	Rees et al. (2004)	Impact of Events Scale (IES)	1	0.4		
	Shears et al. (2005)	Impact of Events Scale-Revised (IES-R)	1	0.42		
	Stuber et al. (1996)	Child PTSD reaction index (CPTSD-RI)	1	0.22		
	Taskiran et al. (2016)	Child PTSD reaction index (CPTSD-RI)	1	0.40		
Readmission/r elapse	Balluffi et al. (2004)	Researcher developed self-report scale	1	0.24		
	Bruce et al. (2010)	Patient information database	1	0.33		
	Franck et al. (2015)	Researcher developed parental questionnaire	1	0.24		
	Norberg et al. (2005)	Medical records	1	0		
	Shi et al. (2017)	Single item question for parents	1	0.01		
Recovery (child)	Landolt et al. (2003)	Researcher developed Single-item Likert-scale (physician rated)	2	0.24*	-0.18	-0.30
	Ribi et al. (2007)	Researcher developed Likert-scale (physician rated)	1	0.31		

Stress (parents)	Franck et al. (2015)	Researcher developed questionnaire (child health following discharge)	1	0.37*		
	Kubota et al. (2016)	Kid-KINDL	1	0.28*		
	Pierce et al. (2017)	Paediatric Quality of Life (PedsQL) – parent version	1	0.37		
	Binder et al. (2011)	Postnatal Complications Rating (PCR)	2	0.26	0.18	0.34
	Farley et al. (2007)	Pediatric Inventory for Parents (PIP; frequency and difficulty)	2	0.62	0.58	0.66
	Forinder & Norberg (2014)	Shirom-Melamed Burnout Questionnaire (SMBQ)	1	0.69		
	Greening et al. (2017)	Cortisol	1	0.14		
	Gudmundsdóttir et al. (2006)	Researcher developed scale (level of disease related daily care)	1	0.7		
Time since diagnosis/treat ment	Lefkowitz (2010)	Concurrent stressors (researcher developed scale)	1	0.34		
	Ribi et al. (2007)	Stress appraisal questions using Likert-scale	1	0.56		
	Fuemmeler et al. (2001)	Patient report and hospital records	1	-0.35		
	Fuemmeler et al. (2005)	Patient report and hospital records	1	0.17		
	Gudmundsdóttir et al. (2006)	Researcher developed scale	1	-0.37		
	Karadeniz Cerit et al. (2017)	Clinical Data Form	1	0.10		
	Lewis et al. (2014)	Researcher developed scale	1	0.01		
	Masa'deh Jarrah (2017)	Researcher developed checklist	1	-0.62		
	Nakajima-Yamaguchi et al. (2016)	Patient records	1	0.23		
	Okado et al. (2016)		1	0.08		
	Pasterski et al. (2014)		1	-0.19		
	Pelcovitz et al. (1996)		1	0		
	Pierce et al. (2017)	Electronic medical records	1	-0.14		
	Stuber et al. (1996)		2	-0.15	-0.14	-0.16
	Treatment/con dition length	Taskiran et al. (2016)	Interview	1	0	
Bronner et al. (2008)		Medical records, data management system (Length of ventilation)	2	0.01	0	0.01
Bruce et al. (2010)		Patient information database (months of treatment)	1	0.07		
Gudmundsdóttir et al. (2006)		Researcher develop scale (number of hospitalisations)	1	0.05		
Iranmanesh et al. (2015)		Researcher developed scale (length of disease)	1	0.01		
Kubota et al. (2016)		Medical records (number of hospitalisations)	1	0.32		
Norberg et al. (2005)		Those still in treatment had more PTSS	1	0.08		
Uncertainty	Okado et al. (2016)	Those still in treatment had more PTSS	1	0.21		
	Franck et al. (2015)	Parents Perception of Uncertainty in Illness Scale (PPUS)	1	0.31		

Socio-Economic Status (SES)	Fuemmeler et al. (2001)	Parents Perception of Uncertainty in Illness Scale (PPUS)	1	0.39		
	Fuemmeler et al. (2005)	Parents Perception of Uncertainty in Illness Scale (PPUS)	1	0.35		
	Nakajima-Yamaguchi et al. (2016)	Parent Experience of Child Illness (PECI) long term uncertainty subscale	1	0.29		
	Tackett et al. (2016)	Parents Perception of Uncertainty in Illness Scale (PPUS)	4	0.28	0.21	0.33
	Franck et al. (2015)	Combining: education level, employment status, SES status, single parents, number of other children	5	-0.05	-	0
	Fuemmeler et al. (2005)	Hollingshead Four-Factor Index of Socioeconomic Status	1	-0.19		
	Gizli Çoban et al. (2017)	Combining: education and family income	2	0	0	0
	Greening et al. (2017)	Hollingshead Four-Factor Index of Socioeconomic Status	1	0.24		
	Gudmundsdóttir et al. (2006)	Combining: education, work status and marital status	3	-0.17	-0.20	-0.13
	Hardy et al. (2008)	Education	1	0		
	Hofmann et al. (2007)	Sociodemographic factors	1	0		
	Karadeniz Cerit et al. (2017)	Combining: education, marital status, duration of marriage and employment	4	-0.02	-0.32	0.12
	Landolt et al. (2002)	Combining: SES and family structure	2	0	0	0
	Landolt et al. (2003)	Combining: SES and family situation	4	0.06	-0.11	0.15
	Landolt et al. (2005)	SES – researcher developed question and algorithm	2	0.07	-0.04	0.18
	Masa'deh & Jarrah (2017)	Combining: employment and education.	2	0.17	0	0.33
	Nakajima-Yamaguchi et al. (2016)	Education	1	-0.16		
	Pasterski et al. (2014)	Paternal occupation	1	0.19		
	Poder et al. (2008)	Non-working status	1	0.15		
	Shi et al. (2017)	Combining: marital status, education and employment	3	0.08	-0.08	0.26
Taskiran et al. (2016)	Family income	1	0			
Tremolada et al. (2013)	Maternal education	1	-0.31			

ASD = Acute Stress Disorder. PTSD = Post-Traumatic Stress Disorder. PTG = Post Traumatic Growth. PTSS – Post Traumatic Stress Symptoms.

Appendix E: Guidelines for Journal of Clinical Child & Adolescent Psychology

About the Journal

Journal of Clinical Child & Adolescent Psychology is an international, peer-reviewed journal publishing high-quality, original research. Please see the journal's Aims & Scope for information about its focus and peer-review policy.

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Journal of Clinical Child & Adolescent Psychology accepts the following types of article:

Regular Articles, Brief Reports, Future Directions

The Journal of Clinical Child and Adolescent Psychology (JCCAP) is the official journal for the Society of Clinical Child and Adolescent Psychology, American Psychological Association, Division 53. It publishes original contributions on the following topics: (1) development and evaluation of assessment and intervention techniques for use with clinical child and adolescent populations; (2) development and maintenance of clinical child and adolescent problems; (3) cross-cultural and sociodemographic issues that have a clear bearing on clinical child and adolescent psychology theory, research, or practice; and (4) training and professional practice in clinical child and adolescent psychology as well as child advocacy. Manuscripts that discuss theoretical and/or methodological issues on topics pertinent to clinical child and adolescent psychology also are considered. Authors need not be members of Division 53 to submit articles to JCCAP. There are several criteria that increase the likelihood that a manuscript will be favorably evaluated in JCCAP: (1) The paper reflects a substantive advance in our understanding of clinical child and adolescent psychology. (2) The paper is of such importance that it likely will influence an area of research. (3) The paper presents new ideas or creative methods. (4) The paper offers theoretically-driven hypotheses. (5) Multiple measures, informants, or procedures are used to collect data. (6) Sophisticated methodologies are carefully employed. (7) Longitudinal methods are used. (8) Data are rigorously and appropriately analyzed. (9) The implications of the findings for clinical child and adolescent psychology are well articulated.

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Regular Articles, Brief Reports, Future Directions

Should be written with the following elements in the following order: title page; abstract; main text; references; appendices (as appropriate); table(s) with caption(s) (on individual pages); figures; figure captions (as a list)

Should contain an unstructured abstract of 250 words.

Read making your article more discoverable, including information on choosing a title and search engine optimization. A Regular Article may not exceed 11,000 words (i.e., 35 pages), including references, footnotes, figures, and tables. Brief Reports include empirical research that is soundly designed, but may be of specialized interest or narrow focus. Brief Reports may not be submitted in part or whole to another journal of general circulation. Brief Reports may not exceed 4,500 words for text and references. These limits do not include the title page, abstract, author note, footnotes, tables, and figures. Manuscripts that exceed these page limits and that are not prepared according to the guidelines in the Manual will be returned to authors without review. Future Directions submissions are written by leading scholars within the field. These articles provide a brief summary of important advances that are needed within a specific research or practice area pertinent to clinical child and adolescent psychology. Future Directions submissions are by invitation only and undergo peer review. All Regular Article and Brief Report submissions must include a title of 15 words or less that identifies the developmental level of the study participants (e.g., children, adolescents, etc.). JCCAP uses an unstructured abstract format. For studies that report randomized clinical trials or meta-analyses, the abstract also must be consistent with the guidelines set forth by CONSORT or MARS, respectively. The Abstract should include up to 250 words, presented in paragraph form. The Abstract should be typed on a separate page (page 2 of the manuscript), and must include each of the following label sections: 1) Objective (i.e., a brief statement of the purpose of the study); 2) Method (i.e., a detailed summary of the participants, N, age, gender, ethnicity, as well as a summary of the study design, measures, and procedures; 3) Results (i.e., a detailed summary of the primary findings that clearly articulate comparison groups (if relevant); 4) Conclusions (i.e., a description of the research and clinical implications of the findings). Avoid abbreviations, diagrams, and reference to the text in the abstract. JCCAP will scrutinize manuscripts for a clear theoretical framework that supports central study hypotheses. In addition, a clear developmental rationale is required for the selection of participants at a specific age. The Journal is making diligent efforts to insure that there is an appropriately detailed description of the sample, including a) the population from which the sample was drawn; b) the number of participants; c) age, gender, ethnicity, and SES of participants; d) location of sample, including country and community type (rural/urban), e) sample identification/selection; f) how participants were contacted; g) incentives/rewards; h) parent consent/child assent procedures and rates; i) inclusion and exclusion criteria; j) attrition rate. The Discussion section should include a comment regarding the diversity and generality (or lack thereof) of the sample. The Measures section should include details regarding item content and scoring as well as evidence of reliability and validity in similar populations. All manuscripts must include a discussion of the clinical significance of findings, both in terms of statistical reporting and in the discussion of the meaningfulness and clinical relevance of results. Manuscripts should a) report means and standard deviations for all variables, b) report effect sizes for analyses, and c) provide confidence intervals wherever appropriate (e.g., on figures, in tables), particularly for effect sizes on primary study findings. In addition, when reporting the results of interventions, authors should include indicators of clinically significant change. Authors may use one of several approaches that have been recommended for capturing clinical significance, including (but not limited to) the reliable change index (i.e., whether the amount of change displayed by a treated individual is large enough to be meaningful, the extent to which dysfunctional

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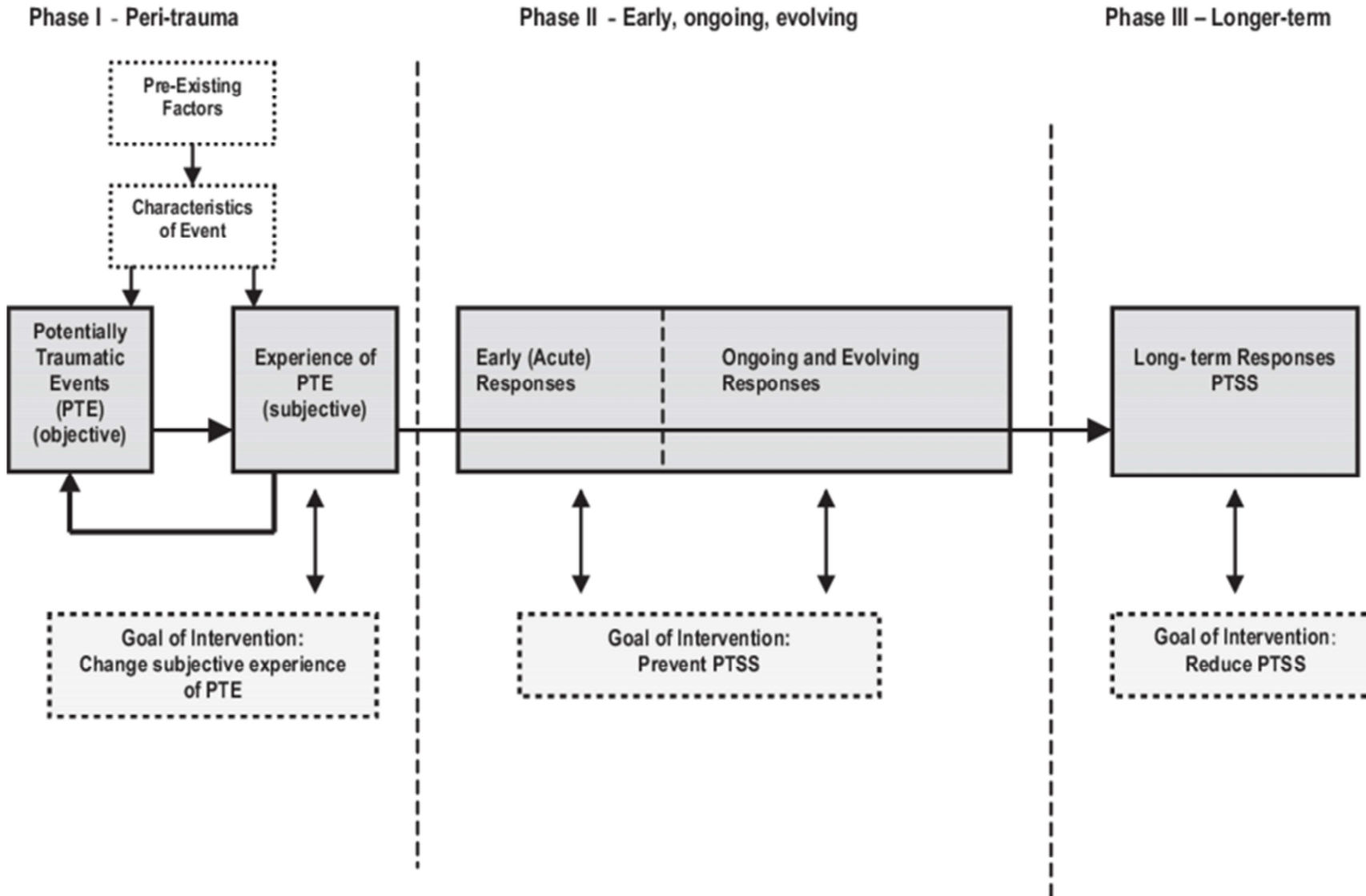
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Appendix: F: Paediatric Medical Traumatic Stress Model (Kazak et al., 2006)



Appendix: G: References of articles used within the meta-analysis

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Appendix H: Recognition task used in empirical paper

Question 1: Please indicate which of the following events could lead to a child developing PTSD. We understand that everyone reacts differently but please answer to the best of your ability.

Please select as many as you think are relevant. If you do not have any knowledge then please select that option.

Close family member suddenly passing away

Sexual abuse

Losing money

An earthquake

Watching a scary cartoon

Being sent home from school

Arguing with a best friend

Serious car accident

Being lied to by parents

Hearing domestic violence

A terrorist attack

Falling off a swing

Physically bullied at school

Parents divorcing or separating

No current knowledge

Question 2: Please indicate which of the following are symptoms of PTSD in children. We understand that everyone reacts differently but please select which you think are the common symptoms.

Please select as many as you think are relevant. If you do not have any knowledge then please select that option.

Having nightmares about the trauma

Scratching self

Hyperactivity for over 3 days

Hoarding

Re-enacting the traumatic event in play

Talking constantly about the event

Angry outbursts

Drug and alcohol abuse

Hearing voices to hurt other people

Avoiding talking or thinking about the trauma

Decreased appetite

Avoiding people or places that remind them of the trauma

Sleep problems

Constantly washing hands

No current knowledge

Question 3: What evidence-based treatment(s) are offered to children with PTSD in NHS mental health services according to national guidelines?

We are not expecting you to be aware of the national guidelines or to research them. But please select those options you believe to be treatment(s) that are offered in the NHS. If you do not have any knowledge then please select that answer.

Animal-Assisted Therapy

Counselling or Psychotherapy

Eye-Movement Desensitisation and Reprocessing (EMDR)

Group Therapy

Medication

Relaxation techniques (including Yoga and Mindfulness)

Trauma-Focused Cognitive Behavioural Therapy (TF-CBT)

No current knowledge

Appendix I: Online questionnaire for parents (empirical paper)**Project: A survey of parents and teachers understanding of and attitudes towards Post-Traumatic Stress Disorder (PTSD) in children**

Chief Investigator: Mr Aaron Burgess

Primary Supervisor: Dr Richard Meiser-Stedman

This research looks to find out what parents and teaching staff know about Post-Traumatic Stress Disorder (PTSD). Researchers need to understand what parents and teaching staff currently think about PTSD in children.

If you are interested in taking part in the study please keep reading. We would ask that you only complete the survey if you have at least one child aged between 7 and 17. This information has been written to help you make a decision on whether you would like to take part. You can ask questions via email to the chief investigator - Aaron.Burgess@uea.ac.uk.

What is the study about?

PTSD is a common mental health problem that can affect children after traumatic events. It can also affect a child's education and desire to be around other people. We do not know parents knowledge of PTSD. By having more knowledge it can increase the likelihood that parents would seek help on their child's behalf.

To support parents to notice PTSD in children we need to find out what their current understanding is. We are asking parents to complete this online survey.

What does the study involve?

The online survey has three sections and should take no more than 5 to 10 minutes to complete. First you are asked questions about you and your children. You are then asked to select the correct answers to questions about PTSD symptoms, traumatic events and treatments. You are then asked questions about seeking help for your child.

Please do not research PTSD before completing the survey. We want to know your current knowledge of PTSD. You will be given ways to find out more information about PTSD at the end of the survey.

Both parents can complete the survey although you will need different devices (e.g. a laptop, smart phone or tablet) but please try not to complete it together.

What if I do not want to take part?

This is fine. If you don't want to take part please close this browser down or select the option below. If you complete the survey you won't be able to withdraw your responses later. If you wish to stop during the survey please close down the webpage.

What are the disadvantages of taking part?

The survey will take about 5 to 10 minutes to complete. You can start and come back to the survey if you find this easier. It is unlikely that the survey will cause you any distress. If it does and you have concerns about yourself or your child we recommend you seek advice from a health professional ASAP.

What are the benefits of taking part?

There are no guaranteed benefits of you taking part in the study. You will be helping the research team learn more about parents understanding of PTSD. As a result of taking part you may learn more about PTSD.

Will my answers be confidential?

Responses on the survey are only seen by the chief investigator. Your child's school will not see your responses. By taking part in the survey you have the option of being entered into a raffle prize draw to win one of two £20 Amazon vouchers. To enter the raffle you need to provide an email address so if you win the voucher can be sent to you. The chief investigator is the only person to access this and no link is made between your email address and responses on the survey. If you provide your email address it will be stored on a university secured network drive. Please do not include any other identifiable information when completing the online survey.

Who has approved the research?

This project has been approved by the UEA Faculty of Medicine and Health Sciences Research Ethics Committee on 13th March 2018; reference: 2017/18 - 85.

What if I am not happy?

If you have any concerns or wish to make a complaint about the project please contact Professor Ken Laidlaw at K.Laidlaw@uea.ac.uk who is head of the clinical psychology department at UEA.

What next?

If you want to take part you will need to read the consent statements below. Please ensure you have read the information above and know what is being asked of you. If you have any further questions please contact the chief investigator.

Statements of consent

Please read the following statements. If you are happy to consent to each statement please select the option to take the survey. By doing so you are consenting to take part in the research.

1. I confirm that I have read the information above. I have had time to consider the information, ask any questions via email and had them answered satisfactorily.

2. I understand that my participation is voluntary and that I can withdraw from the survey by closing the webpage and my medical care and legal rights are not affected.
3. I understand that once my answers have been submitted I can no longer withdraw my answers.
4. I understand that the chief investigator will have access to my email address if I provide it for the raffle prize and that this will be deleted once the survey closes.
5. I agree to take part in this project.
 - Take the survey!
 - I do not wish to take part in this study

Section 1 – Information about you and your child

The following questions are about you and your child(ren). Please answer to the best of your ability.

Question 1: How old are you?

Question 2: How would you class your gender?

Male/Female/Other/Prefer not to say

Question 3: How many children do you have?

1/2/3/4/5 or more

Question 4: How old is your oldest (or only) child?

0 – 5/6 – 10/11 – 15/16 – 20/21 – 25/26 +

Question 5: How old is your youngest child (please do not answer if you only have one child)?

0 – 5/6 – 10/11 – 15/16 – 20

Question 6: Are you the child's ...

Parent or Guardian/Foster carer/parent/Other (please specify)

Question 7: What is your current relationship status?

Married/In a relationship (co-habiting)/In a relationship (not co-habiting)/Single

Question 8: Which best describes your employment status?

Full time employment/Part time employment/Full time education/Unemployed/Other (please specify)

Question 9: What is your current residence status?

Homeowner/Part rent/part buy/Renting/Living with parents/guardians/Other (please specify)

Question 10: Have you or your partner ever been employed by the military services (e.g. Army, RAF, Navy)

Yes/No

Question 11: Would you describe yourself as having a mental health difficulty?

Yes/No/Do not wish to say

Section 2 - Traumatic events, PTSD symptoms and effective treatments

You will be asked three questions and asked to select the correct answers to each.

Please try and answer as best as you can and do not read up on PTSD before completing. It does not matter if you don't know the correct answers you will be given these at the end of the survey.

Please consider a child in these questions as aged 7 to 17.

Question 1: Please indicate which of the following events could lead to a child developing PTSD. We understand that everyone reacts differently but please answer to the best of your ability.

Please select as many as you think are relevant. If you do not have any knowledge then please select that option.

Close family member suddenly passing away

Sexual abuse

Losing money

An earthquake

Watching a scary cartoon

Being sent home from school

Arguing with a best friend

Serious car accident

Being lied to by parents

Hearing domestic violence

A terrorist attack

Falling off a swing

Physically bullied at school

Parents divorcing or separating

No current knowledge

Question 2: Please indicate which of the following are symptoms of PTSD in children. We understand that everyone reacts differently but please select which you think are the common symptoms.

Please select as many as you think are relevant. If you do not have any knowledge then please select that option.

Having nightmares about the trauma

Scratching self

Hyperactivity for over 3 days

Hoarding

Re-enacting the traumatic event in play

Talking constantly about the event

Angry outbursts

Drug and alcohol abuse

Hearing voices to hurt other people

Avoiding talking or thinking about the trauma

Decreased appetite

Avoiding people or places that remind them of the trauma

Sleep problems

Constantly washing hands

No current knowledge

Question 3: What evidence-based treatment(s) are offered to children with PTSD in NHS mental health services according to national guidelines?

We are not expecting you to be aware of the national guidelines or to research them. But please select those options you believe to be treatment(s) that are offered in the NHS. If you do not have any knowledge then please select that answer.

Animal-Assisted Therapy

Counselling or Psychotherapy

Eye-Movement Desensitisation and Reprocessing (EMDR)

Group Therapy

Medication

Relaxation techniques (including Yoga and Mindfulness)

Trauma-Focused Cognitive Behavioural Therapy (TF-CBT)

No current knowledge

Question 1: Please rate your agreement to the following statements

I would be happy for my child to be screened for PTSD as part of a wider mental health screening process in school

Strongly disagree/Somewhat disagree/Neither agree nor disagree/Somewhat agree/Strongly agree

I would be happy for my child to be screened for PTSD in school following a major incident affecting lots of people in the local area

Strongly disagree/Somewhat disagree/Neither agree nor disagree/Somewhat agree/Strongly agree

If my child had PTSD it would be important for me to seek help on their behalf

Strongly disagree/Somewhat disagree/Neither agree nor disagree/Somewhat agree/Strongly agree

Question 2: Please select the response which best describes how you would behave in this situation.

I would seek professional help for my child following a traumatic event if PTSD symptoms were present for ...

... 1 day

Yes/No/Maybe/Don't know

... 4 weeks

Yes/No/Maybe/Don't know

... 3 months

Yes/No/Maybe/Don't know

... 6 months

Yes/No/Maybe/Don't know

Question 3: I would be confident in finding out more information about PTSD from ...

... a family member

Yes/No/Maybe/Don't know

... a friend

Yes/No/Maybe/Don't know

... a GP

Yes/No/Maybe/Don't know

... Accident & Emergency

Yes/No/Maybe/Don't know

... private health services

Yes/No/Maybe/Don't know

... a psychologist

Yes/No/Maybe/Don't know

... the school

Yes/No/Maybe/Don't know

... the internet

Yes/No/Maybe/Don't know

Question 4: Where does your current knowledge of PTSD come from? Please select all that apply.

Family/Friends/Online/School/Health professionals/TV/Social Media/Own research/Other (please specify)

Question 5: If you wanted to seek further information about PTSD where would you go? Please select all that apply.

Family/Friends/Online/School/Health professionals/TV/Social Media/Research myself/Library/Other (please specify)

If you wish to be entered into the raffle prize draw to win a £20 Amazon voucher please provide your email address in the space below. When data is stored your email addresses are kept separate from your responses on the survey.

This is the end of the survey. Thank you very much for taking the time to complete the survey. If you wish to find out more information on PTSD please use the websites below:

<http://www.rcpsych.ac.uk/healthadvice/problemsdisorders/posttraumaticstressdisorder.aspx>

<https://mind.org.uk/information-support/types-of-mental-health-problems/post-traumatic-stress-disorder-ptsd/#.WRXJgrmGOUk>

<http://www.nhs.uk/conditions/post-traumatic-stress-disorder/pages/introduction.aspx>

If you believe you or your child may have been involved in a traumatic event or has been displaying PTSD symptoms 3 months following a traumatic event we would recommend you seek immediate support from your GP who can refer you to the appropriate healthcare professional.

The research team can be contacted for further information if necessary by email (aaron.burgess@uea.ac.uk). If you have any concerns about this project please contact the primary supervisor via email: R.Meiser-Stedman@uea.ac.uk.

Here are what we believe to be the correct responses to section 2 of the survey. We understand that every individual is different and there can be variations in individual PTSD cases.

PTSD Traumatic Events:

- Close family member suddenly passing away
- Sexual abuse
- An earthquake
- Serious car accident
- Hearing domestic violence
- A terrorist attack
- Physically bullied at school

PTSD Symptoms:

- Nightmares about trauma
- Re-enacting the trauma through play
- Angry outbursts
- Avoidance talking/thinking about trauma

- Avoiding people/places of the trauma
- Sleep problems

Treatment offered in the NHS:

Watchful waiting is used initially to see whether a child naturally recovers from the trauma as many children do. If a child still presented with PTSD 3 months following a trauma they should be offered Trauma-Focused CBT which is recommended by the National Institute of Health and Care Excellence in the United Kingdom. Although many other treatments and strategies can be helpful for children with PTSD they are not recommended by these national guidelines nor routinely offered within the NHS.

Thank you again for taking the survey.

Appendix J: Online questionnaire for teachers (empirical paper)**Project: A survey of parents and teachers understanding of and attitudes towards Post-Traumatic Stress Disorder (PTSD) in children**

Chief Investigator: Mr Aaron Burgess

Primary Supervisor: Dr Richard Meiser-Stedman

This research looks to find out what parents and teaching staff know about Post-Traumatic Stress Disorder (PTSD). Researchers need to understand what parents and teaching staff currently think about PTSD in children.

If you are interested in taking part in the study please keep reading. It has been written to help you make a decision on whether you would like to take part. You can ask questions via email to the chief investigator - Aaron.Burgess@uea.ac.uk.

What is the study about?

PTSD is a common mental health problem that can affect children after traumatic events. It can also affect a child's education and desire to be around other people. We do not know teaching staff's knowledge of PTSD. By having more knowledge it can increase the likelihood that staff would seek help on behalf of a child in the school.

To support teaching staff to notice PTSD in children we need to find out what their current understanding is. We are asking teachers and teaching assistants to complete this online survey.

What does the study involve?

The online survey has two sections and should take no more than 5 minutes to complete. First you are asked questions about you and your role in the school. Please only complete this survey if you work directly with children aged 7 to 17. You will then be asked to select the correct answers to questions about PTSD symptoms, traumatic events and treatments.

Please do not research PTSD before completing the survey. We want to know your current knowledge of PTSD. You will be given ways to find out more information about PTSD at the end of the survey. Please try to complete this survey alone and not with colleagues.

What if I do not want to take part?

This is fine. If you don't want to take part please close this browser down or select the option below. If you complete the survey you won't be able to withdraw your responses later. If you wish to stop during the survey please close down the webpage.

What are the disadvantages of taking part?

The survey will take about 5 minutes to complete. You can start and come back to the survey if you find this easier. It is unlikely that the survey will cause you any distress. If it does we recommend you seek advice from a health professional ASAP.

What are the benefits of taking part?

There are no guaranteed benefits of you taking part in the study. You will be helping the research team learn more about teaching staff's PTSD knowledge. As a result of taking part you may learn more about PTSD as well.

Will my answers be confidential?

Responses on the survey are only seen by the chief investigator. The school will not see your responses. By taking part in the survey you have the option of being entered into a raffle prize draw to win one of two £20 Amazon vouchers. To enter the raffle you need to provide an email address so if you win the voucher can be sent to you. The chief investigator is the only person to access this and no link is made between your email address and responses on the survey. If you provide your email address it will be stored on a university secured network drive. Please do not include any other identifiable information when completing the online survey.

Who has approved the research?

This project has been approved by a UEA Faculty of Medicine and Health Sciences Research Ethics Committee on 13th March 2018; reference: 2017/18 - 85.

What if I am not happy?

If you have any concerns or wish to make a complaint about the project please contact Professor Ken Laidlaw at K.Laidlaw@uea.ac.uk who is head of the clinical psychology department at UEA.

What next?

If you want to take part you will need to read the consent statements below. Please ensure you have read the information above and know what is being asked of you. If you have any further questions please contact the chief investigator.

Statements of consent

Please read the following statements. If you are happy to consent to each statement please select the option to take the survey. By doing so you are consenting to take part in the research.

1. I confirm that I have read the information above. I have had time to consider the information, ask any questions via email and had them answered satisfactorily.
2. I understand that my participation is voluntary and that I can withdraw from the survey by closing the webpage without my medical care and legal rights affected.

3. I understand that once my answers have been submitted I can no longer withdraw them.
4. I understand that the chief investigator will have access to my email address if I provide it for the raffle prize and that this will be deleted once the survey closes.
5. I agree to take part in this project.

Take the survey!

I do not wish to take part in this study

Section 1 – Information about you and your role

The following questions are about you and your role within the school. Please answer to the best of your ability.

Question 1: How old are you?

Question 2: How would you class your gender?

Male/Female/Other/Prefer not to say

Question 3: are you a teacher or teaching assistant?

Teacher/Teaching Assistant

Question 4: How many years have you been a teacher or teaching assistant?

0 – 5/6 – 10/11 – 15/16 – 20/21 +

Question 5: What aged children do you teach/work with? (tick all that apply)

0 – 5/6 – 10/11 – 15/16 – 17

Question 6: On average, how many hours per week are you directly working with children?

0 – 10/11 – 20/21 – 30/31 +

Question 7: Have you ever worked with a child who has been diagnosed with PTSD?

Yes (if so how many)

No/Not sure/Prefer not to say

Question 8: Have you received any PTSD or trauma focussed training over the past three years?

Yes/No/Not sure/Prefer not to say

Question 9: Have you or your partner ever been employed by the military services (e.g. Army, RAF, Navy)

Yes/No

Question 10: Would you describe yourself as having a mental health difficulty?

Yes/No/Do not wish to say

Question 11: Which option below best describes the type of school you work at?

Primary school/Secondary school/Special educational needs or a Pupil Referral Unit (PRU)/Other (please specify)

Section 2 - Traumatic events, PTSD symptoms and effective treatments

You will be asked three questions and asked to select the correct answers to each.

Please try and answer as best as you can and do not read up on PTSD before completing. It does not matter if you don't know the correct answers you will be given these at the end of the survey.

Please consider a child in these questions as aged 7 to 17.

Question 1: Please indicate which of the following events could lead to a child developing PTSD. We understand that everyone reacts differently but please answer to the best of your ability.

Please select as many as you think are relevant. If you do not have any knowledge then please select that option.

Close family member suddenly passing away

Sexual abuse

Losing money

An earthquake

Watching a scary cartoon

Being sent home from school

Arguing with a best friend

Serious car accident

Being lied to by parents

Hearing domestic violence

A terrorist attack

Falling off a swing

Physically bullied at school

Parents divorcing or separating

No current knowledge

Question 2: Please indicate which of the following are symptoms of PTSD in children. We understand that everyone reacts differently but please select which you think are the common symptoms.

Please select as many as you think are relevant. If you do not have any knowledge then please select that option.

Having nightmares about the trauma

Scratching self

Hyperactivity for over 3 days

Hoarding

Re-enacting the traumatic event in play

Talking constantly about the event

Angry outbursts

Drug and alcohol abuse

Hearing voices to hurt other people

Avoiding talking or thinking about the trauma

Decreased appetite

Avoiding people or places that remind them of the trauma

Sleep problems

Constantly washing hands

No current knowledge

Question 3: What evidence-based treatment(s) are offered to children with PTSD in NHS mental health services according to national guidelines?

We are not expecting you to be aware of the national guidelines or to research them. But please select those options you believe to be treatment(s) that are offered in the NHS. If you do not have any knowledge then please select that answer.

Animal-Assisted Therapy

Counselling or Psychotherapy

Eye-Movement Desensitisation and Reprocessing (EMDR)

Group Therapy

Medication

Relaxation techniques (including Yoga and Mindfulness)

Trauma-Focused Cognitive Behavioural Therapy (TF-CBT)

No current knowledge

Please rate your agreement to the following two questions regarding PTSD screening measures being used in schools.

Question 4: I would be happy for children to be screened for PTSD in school as part of a wider mental health screening process

Strongly disagree/Somewhat disagree/Neither agree nor disagree/Somewhat agree/Strongly agree

Question 5: I would be happy for children to be screened for PTSD in school following a major incident affecting lots of people in the local area

Strongly disagree/Somewhat disagree/Neither agree nor disagree/Somewhat agree/Strongly agree

If you wish to be entered into the raffle prize draw to win a £20 Amazon voucher please provide your email address in the space below. When data is stored your email addresses are kept separate from your responses on the survey.

This is the end of the survey. Thank you very much for taking the time to complete the survey. If you wish to find out more information on PTSD please use the websites below:

<http://www.nhs.uk/conditions/post-traumatic-stress-disorder/pages/introduction.aspx>

<https://mind.org.uk/information-support/types-of-mental-health-problems/post-traumatic-stress-disorder-ptsd/#.WRXJgrmGOUk>

<http://www.rcpsych.ac.uk/healthadvice/problemsdisorders/posttraumaticstressdisorder.aspx>

If you believe a child in the school may have been involved in a traumatic event or has been displaying PTSD symptoms for 3 months following a traumatic event we would recommend you speak with the child's parent or guardian and inform them of your concerns. Alternatively you could ask your internal pastoral lead or the head teacher to do this on your behalf. We would recommend to parents that they seek immediate support from their GP who can refer them to specialist services. If you believe you have also been

involved in a traumatic event or displaying PTSD symptoms 3 months following a trauma we would recommend you seek immediate support from your GP who can refer you to an appropriate healthcare professional.

The research team can be contacted for further information if necessary by email (aaron.burgess@uea.ac.uk). If you have any concerns about this project please contact the primary supervisor via email: R.Meiser-Stedman@uea.ac.uk.

Here are what we believe to be the correct responses to section 2 of the survey. We understand that every individual is different and there can be variations in individual PTSD cases.

PTSD Traumatic Events:

- Close family member suddenly passing away
- Sexual abuse
- An earthquake
- Serious car accident
- Hearing domestic violence
- A terrorist attack
- Physically bullied at school

PTSD Symptoms:

- Nightmares about trauma
- Re-enacting the trauma through play
- Angry outbursts
- Avoidance talking/thinking about trauma
- Avoiding people/places of the trauma
- Sleep problems

Treatment offered in the NHS:

Watchful waiting is used initially to see whether a child naturally recovers from the trauma as many children do. If a child still presented with PTSD 3 months following a trauma they should be offered Trauma-Focused CBT which is recommended by the National Institute of Health and Care Excellence in the United Kingdom. Although many other treatments and strategies can be helpful for children with PTSD they are not recommended by these national guidelines nor routinely offered within the NHS.

Thank you again for taking the survey.

Appendix K: Research advertisements for empirical paper**PARENTS NEEDED FOR ONLINE SURVEY!**

The University of East Anglia (UEA) and the NHS are funding a project to find out what parents know about post-traumatic stress disorder (PTSD). It's online and only takes 5-10 minutes to complete. There are two chances to win a £20 Amazon voucher. If you would like to take part and know more about the survey please follow this link: https://ueapsych.eu.qualtrics.com/jfe/form/SV_0iADJ8Sp7jMxdQ1. If you wish to contact a member of the research team please email: Aaron.Burgess@uea.ac.uk.

Thank you!

TEACHERS AND TEACHING ASSISTANTS NEEDED FOR ONLINE SURVEY!

The University of East Anglia (UEA) and the NHS are funding a project to find out what teachers and teaching assistants know about post-traumatic stress disorder (PTSD). It's online and only takes 5-10 minutes to complete. There are two chances to win a £20 Amazon voucher. If you would like to take part and know more about the survey please follow this link:

https://ueapsych.eu.qualtrics.com/jfe/form/SV_aaxccJ9fdBigVcp. If you wish to contact a member of the research team please email: Aaron.Burgess@uea.ac.uk

Thank you!

Appendix L: Ethical approval letter (empirical paper)

Faculty of Medicine and Health Sciences Research Ethics Committee



Research & Innovation Services
Floor 1, The Registry
University of East Anglia
Norwich Research Park
Norwich, NR4 7TJ

Email: fmh.ethics@uea.ac.uk

Web: www.uea.ac.uk/researchandenterprise

Aaron Burgess
MED

13.3.18

Dear Aaron,

Project Title: A survey of parents and teachers understanding of and attitudes towards Post-Traumatic Stress Disorder (PTSD) in children

Reference: 2017/18 - 85

The submission of your above proposal has been considered by the Faculty Research Ethics Committee and we can confirm that your proposal has been approved.

Please could you ensure that any further amendments to either the protocol or documents submitted are notified to us in advance and also that any adverse events which occur during your project are reported to the Committee. Please could you also arrange to send us a report once your project is completed.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'M J Wilkinson', is written over a horizontal line.

Professor M J Wilkinson
Chair
FMH Research Ethics Committee

Appendix M: List of items for PTSD domains – pilot

Please indicate which of the following events could lead to a child developing PTSD. Please select as many as you think are relevant:

Close family member suddenly passing away

Sexual abuse

Losing money

An earthquake

Watching a scary cartoon

Being sent home from school

Arguing with a best friend

Serious car accident

Being lied to by parents

Hearing domestic violence

A terrorist attack

Falling off a swing

Physically bullied at school

Parents divorcing or separating

Please indicate which of the following are symptoms of PTSD in children. Please select as many as you think are relevant:

Having nightmares about the trauma

Scratching self

Hyperactivity for over 3 days

Hoarding

Re-enacting the traumatic event in play

Talking constantly about the event

Angry outbursts

Hearing voices to hurt other people

Avoiding talking or thinking about the trauma

Decreased appetite

Avoiding people or places that remind them of the trauma

Sleep problems

Constantly washing hands

What evidence-based treatment(s) are offered to children with PTSD in NHS mental health services according to national guidelines?

Animal-Assisted Therapy

Counselling or Psychotherapy

Eye-Movement Desensitisation and Reprocessing (EMDR)

Group Therapy

Medication

Relaxation techniques (including Yoga and Mindfulness)

Trauma-Focused Cognitive Behavioural Therapy (TF-CBT)

Appendix N: Online questionnaire (pilot)

Project: A survey of teaching staff, parents' and caregivers' understanding of and attitudes towards Post-Traumatic Stress Disorder (PTSD) in children

Chief Investigator: Mr Aaron Burgess

Primary Supervisor: Dr Richard Meiser-Stedman

A research project has been funded at the University of East Anglia (UEA) looking into what parents and teaching staff understand about Post-Traumatic Stress Disorder (PTSD) in children. As part of this project the research team are developing a survey to identify parents and teaching staff's level of knowledge.

If you wish to know more about this project please continue to read the information below. It has been written to help you make a decision on whether you would like to take part in this stage of the project. If you wish to ask questions via email with the chief investigator please email Aaron.Burgess@uea.ac.uk.

What is the study about?

Post-Traumatic Stress Disorder (PTSD) is a common mental health problem that can affect children after experiencing traumatic events. It can affect their mental health, their education and their desire to be around other people. However, we don't know parents and teaching staff's level of understanding about PTSD. By having more knowledge about a disorder, it increases the likelihood that the person will seek help for it, or seek help on a child's behalf.

To be able to help parents and teaching staff notice PTSD in children we first need to find out what their current understanding is. This is what the current project is looking to do. However we first need to make sure the survey does what we intend it to do. Therefore we are asking a group of parents to complete a draft of the survey and then make comments on it. After this we will take these comments into consideration when improving the survey.

What does the study involve?

You will be asked to complete three sections of an online survey which should take no more than 5-10 minutes. Firstly you will be asked multiple-choice questions about yourself. You will then be asked three questions about potential traumatic events, symptoms of PTSD and effective treatments for PTSD. You are asked to select the correct answers from a list. Finally you will be asked to rate your agreement to various statements about help-seeking behaviour on behalf of your child.

At the end of the survey there are some questions about the design, layout and wording of the survey. We also ask you if you agree with what we believe are the correct answers to the PTSD questions in section 2. Please let us know if you do not agree with these and why. We want to make sure that the survey is very user friendly and causes no confusion. This is why we are testing it out before we finalise the survey.

What if I do not want to take part?

This is fine. If you do not wish to be part of this project then please close this browser down or select the option below of not wanting to take part. If you do complete the survey and submit your answers you will not be able to withdraw your answers after this. If you wish to stop during the survey please close down the webpage, your answers will not be submitted if you do this.

What are the disadvantages of taking part?

The survey will take around 5-10 minutes of your time to complete. You can start and come back to the survey if you find this easier. It is unlikely that the survey will cause you any distress or anxiety. However if it does and you have concerns about yourself or your child we recommend you seek advice from your GP.

What are the benefits of taking part?

There are no guaranteed benefits for you taking part in the study. You will be part of a group shaping this survey which is hoped to have a wider impact in the future. The results of this survey are hopefully going to help other researchers and clinicians know what parents and teaching staff do and do not know about PTSD and aim to educate them. By taking part in this project you may also learn more about PTSD.

Will my answers be confidential?

No identifiable information is collected so your responses will remain anonymous. The school will not be aware of your responses on this survey.

If you make contact with a member of the research team by email they will also be aware of your email address, although confidentiality between the research team is a high priority. We would only break confidentiality if you told us something that puts you or others at risk of harm.

Who has approved the research?

This project has been approved by the UEA Faculty of Medicine and Health Sciences Research Ethics Committee on [insert date of approval].

What if I am not happy?

If you have any concerns or wish to make a complaint about the project please contact Professor Ken Laidlaw at K.Laidlaw@uea.ac.uk or phone 01603 593600.

What next?

If you decide to take part in the project you will need to read the consent statements below. After this you will be taken to the first section of the survey. Please ensure you have read the information above and know what is being asked of you. If you have any further questions please contact the chief investigator: Aaron.Burgess@uea.ac.uk.

Statements of consent

Please read the following statements. If you are happy to consent to each statement please select the option to take the survey below. By doing so you are consenting to take part in the research. You will then be taken to the first page of the survey.

1. I confirm that I have read the information above about this research project. I have had time to consider this information, ask questions via email if I wished and had them answered satisfactorily, if necessary.
2. I understand that my participation is voluntary and that I can withdraw from the survey by closing the webpage and my medical care and legal rights are not affected.
3. I understand that once my answers have been submitted I can no longer withdraw my answers.
4. I understand that if I make contact with the research team and they are concerned about the safety of myself and others they may have to break confidentiality.
5. I agree to take part in this project.

Please choose whether you wish to take the survey below

Take the survey!

I do not wish to take part in this study

The following questions are about you and your child(ren). Please answer to the best of your ability.

How old are you?

How would you class your gender?

Male/Female/Other/Prefer not to say

How many children do you have?

1/2/3/4/5+

How old is your eldest (or only) child?

0 – 5/6 – 10/11 – 15/16 – 20/21 – 25/26+

How old is your youngest child (please do not answer if you only have one child)?

0 – 5/6 – 10/11 – 15/16 – 20

Are you the child's

Parent/Guardian/Caregiver/Foster Carer/Parent/Other (please specify)

What is your current relationship status?

Single/In a relationship (not co-habiting)/In a relationship (co-habiting)/Married

Which best describes your employment status?

Full time employment/Part time employment/Full time education/Unemployed

Have you or your partner ever been employed by the military services (e.g. Army, RAF, Navy)

Yes/No

What is your current residence status?

Home owner/Part rent / part buy/Renting/Living with parents/Other

Would you describe yourself as having a mental health difficulty?

Yes (please specify)/No/Not sure/Do not wish to say

You will be asked three questions and asked to select the correct answers to each. Please don't read up on post-traumatic stress disorder (PTSD) before completing. It does not matter if you don't know the correct answers. A child in these questions is aged 7 to 17.

Please indicate which of the following events could lead to a child developing PTSD. Please select as many as you think are relevant:

Close family member suddenly passing away

Sexual abuse

Losing money

An earthquake

Watching a scary cartoon

Being sent home from school

Arguing with a best friend

Serious car accident

Being lied to by parents

Hearing domestic violence

A terrorist attack

Falling off a swing

Physically bullied at school

Parents divorcing or separating

Please indicate which of the following are symptoms of PTSD in children. Please select as many as you think are relevant:

Having nightmares about the trauma

Scratching self

Hyperactivity for over 3 days

Hoarding

Re-enacting the traumatic event in play

Talking constantly about the event

Angry outbursts

Hearing voices to hurt other people

Avoiding talking or thinking about the trauma

Decreased appetite

Avoiding people or places that remind them of the trauma

Sleep problems

Constantly washing hands

What evidence-based treatment(s) are offered to children with PTSD in NHS mental health services according to national guidelines?

Animal-Assisted Therapy

Counselling or Psychotherapy

Eye-Movement Desensitisation and Reprocessing (EMDR)

Group Therapy

Medication

Relaxation techniques (including Yoga and Mindfulness)

Trauma-Focused Cognitive Behavioural Therapy (TF-CBT)

The following questionnaire asks you to rate your agreement to statements from strongly disagree (1) to strongly agree (5). Please answer honestly. There are no right or wrong answers.

PTSD = Post-Traumatic Stress Disorder. A child in this questionnaire is aged 7 to 17.

Please rate your agreement to the following statements

I would be happy for my child to be screened for PTSD as part of a wider mental health screening process in school

Strongly disagree/Somewhat disagree/Neither agree nor disagree/Somewhat agree/Strongly agree

I would be happy for my child to be screened for PTSD in school following a major incident affecting lots of people in the local area

Strongly disagree/Somewhat disagree/Neither agree nor disagree/Somewhat agree/Strongly agree

If my child had PTSD it would be important for me to seek help on their behalf

Strongly disagree/Somewhat disagree/Neither agree nor disagree/Somewhat agree/Strongly agree

I would seek professional help for my child following a traumatic event if PTSD symptoms were present for ...

... 1 day

Strongly disagree/Somewhat disagree/Neither agree nor disagree/Somewhat agree/Strongly agree

... 4 weeks

Strongly disagree/Somewhat disagree/Neither agree nor disagree/Somewhat agree/Strongly agree

... 3 months

Strongly disagree/Somewhat disagree/Neither agree nor disagree/Somewhat agree/Strongly agree

... 6 months

Strongly disagree/Somewhat disagree/Neither agree nor disagree/Somewhat agree/Strongly agree

I would be confident in finding more information about PTSD from ...

... a family member

Strongly disagree/Somewhat disagree/Neither agree nor disagree/Somewhat agree/Strongly agree

... a friend

Strongly disagree/Somewhat disagree/Neither agree nor disagree/Somewhat agree/Strongly agree

... a GP

Strongly disagree/Somewhat disagree/Neither agree nor disagree/Somewhat agree/Strongly agree

... Accident & Emergency

Strongly disagree/Somewhat disagree/Neither agree nor disagree/Somewhat agree/Strongly agree

... private health services

Strongly disagree/Somewhat disagree/Neither agree nor disagree/Somewhat agree/Strongly agree

... a psychologist

Strongly disagree/Somewhat disagree/Neither agree nor disagree/Somewhat agree/Strongly agree

... the school

Strongly disagree/Somewhat disagree/Neither agree nor disagree/Somewhat agree/Strongly agree

... the internet

Strongly disagree/Somewhat disagree/Neither agree nor disagree/Somewhat agree/Strongly agree

Where does your current knowledge of PTSD come from? Please select all that apply.

Family/Friends/Online/School/Health professionals/TV/Social Media/Own research/Other (please specify)

If you wanted to seek further information about PTSD where would you go? Please select all that apply.

Family/Friends/Online/School/Health professionals/TV/Social Media/Research myself/Library/Other (please specify)

Thank you for completing this survey. Your responses and feedback on the accessibility and format of the survey will be used to further shape it. If you could answer the following questions we would be greatly appreciated.

On a scale from 1 (strongly disagree) to 10 (strongly agree) ...

the survey just completed was easy to complete

1/2/3/4/5/6/7/8/9/10

the questions on the survey are easy to understand

1/2/3/4/5/6/7/8/9/10

the survey was easy to follow

1/2/3/4/5/6/7/8/9/10

I found completing this survey distressing or upsetting

1/2/3/4/5/6/7/8/9/10

the information provided before the survey was easy to understand

1/2/3/4/5/6/7/8/9/10

I was aware of my of my rights as a participant

1/2/3/4/5/6/7/8/9/10

What could be changed to the survey to make it more user-friendly?

How long did this survey take you to complete?

Here are the correct answers to section 2. Please use the boxes below to say if you disagree with any of the correct responses and give a reason why.

PTSD Traumatic Events:

Close family member suddenly passing away

Sexual abuse

An earthquake

Serious car accident

Hearing domestic violence

A terrorist attack

Physically bullied at school

PTSD Symptoms:

Nightmares about trauma

Re-enacting the trauma through play

Angry outbursts

Avoidance talking/thinking about trauma

Avoiding people/places of the trauma

Sleep problems

Treatment offered in the NHS:

Watchful waiting is used initially to see whether a child naturally recovers from the trauma as many children do. If a child still presented with PTSD they should be offered Trauma-Focused Cognitive Behavioural Therapy (TF-CBT) which is recommended by the National Institute of Health and Care Excellence in the United Kingdom. Although many other treatments and strategies can be helpful for children with PTSD they are not recommended by these national guidelines nor routinely offered within the NHS.

If you wish to find out more about PTSD, information on how is provided below. Please remember to submit your answers by clicking the button below.

<http://www.nhs.uk/conditions/post-traumatic-stress-disorder/pages/introduction.aspx>

<https://mind.org.uk/information-support/types-of-mental-health-problems/post-traumatic-stress-disorder-ptsd/#.WRXJgrmGOUk>

<http://www.rcpsych.ac.uk/healthadvice/problemsdisorders/posttraumaticstressdisorder.aspx>

If you believe your child may have been involved in a traumatic event or has been displaying PTSD symptoms 3 months following a traumatic event we would recommend you seek immediate support from your GP who can refer you to the appropriate healthcare professional.

The research team can be contacted for further information if necessary by email (aaron.burgess@uea.ac.uk). If you have any concerns about this project please contact the project supervisor via email: R.Meiser-Stedman@uea.ac.uk.

This is the end of the survey. Thank you again for taking part in this project. Your contributions are valued by the research team. Please submit your answers by clicking the arrow below.

Appendix O: Ethical approval letter (pilot)

Faculty of Medicine and Health Sciences Research Ethics Committee



Aaron Burgess
MED

Research & Innovation Services
Floor 1, The Registry
University of East Anglia
Norwich Research Park
Norwich, NR4 7TJ

Email: imb.ethics@uea.ac.uk

Web: www.uea.ac.uk/researchandenterprise

2/11/17

Dear Aaron,

Title: A survey of teaching staff, parents' and caregivers' understanding of and attitudes towards Post-Traumatic Stress Disorder (PTSD) in children

Reference: 201718 - 22

The submission of your research proposal was discussed at the Faculty Research Ethics Committee meeting on 26/10/17.

The Committee is only approving the pilot study, the larger study will need a separate application.

The Committee were happy to approve your application in principle but have the following concerns which they would like you to address and amend accordingly:

1. It is important that the researcher does not have access to contact details of the teaching assistants/teachers/parents prior to them completing the questionnaire. This needs to be clear in the protocol that the school/NUT group will be the ones forwarding/sending the invitation on your behalf. Linking a participant's code to their email is not maintaining anonymity.
2. Teachers recruited through the NUT health and safety group who have granted permission to send out information. No gatekeeper consent has been provided here – would like to see confirmation that the NUT agree to this.
3. Recruitment of schools in East Anglia – who will be contacting these schools on the alphabetised list and how? Will there be a contact at the school e.g. headteacher?
4. Please give more information on the recruitment of parents and how this will happen. I appreciate that this will depend on the school in question but it would be good to get a feel for how they might be approached to participate.
5. It is unclear what the sample size of 92 relates to.
6. We need to see the online survey.
7. state how many times you will resend the invitation and at what time intervals.
8. Correct name for REC required in PISs
9. Statement of consent (at end of PISs) states 'initial in boxes below', this isn't possible as it's an online survey.
10. Application states that the pilot documentation will be sent to a PPI group – has this been done already? If not, we will need to see the final documentation.
11. The info sheet for schools might be better written as a letter, or alternatively there should be a cover letter of e-mail to go with it.
12. The school info sheet should define 'teaching staff', and there's probably other standard info that needs to be included

13. PIS – 'will my answers be confidential' – participant contact details should not be stored on a memory stick, rather saved to a secure network drive.
14. PIS – 'what if I'm not happy'? should this refer the person only to the independent person, not the supervisor?
15. PIS - Consent form / questions – request is to initial the boxes; HRA guidance indicates consent can be considered as given on an online survey if participants informed that to proceed to the next page constitutes consent. Perhaps this would be simpler?
16. Appendices D, L, M – gender question needs to be made inclusive (e.g. F, M, other) unless asking about sex (M, F)

Please write to me once you have resolved/clarified the above issues. I require documentation confirming that you have complied with the Committee's requirements. The Committee have requested that you detail the changes below the relevant point on the text in this letter and also include your amendments as a tracked change within your application/proposal. The revisions to your application can be considered by Chair's action rather than go to a committee meeting, which means that the above documentation can be resubmitted at any time. Please could you send your revisions to me as an attachment in an email as this will speed up the decision making process.

As your project does not have ethics approval until the above issues have been resolved, I want to remind you that you should not be undertaking your research project until you have ethical approval by the Faculty Research Ethics Committee. Planning on the project or literature based elements can still take place but not the research involving the above ethical issues. This is to ensure that you and your research are insured by the University and that your research is undertaken within the University's 'Guidelines on Good Practice in Research' approved by Senate in July 2015.

Yours sincerely



Professor M J Wilkinson
Chair
FMH Research Ethics Committee

CC: Richard Meiser-Stedman

Appendix P – Risk factors only reported in one study (meta-analysis)**Table A.3. Risk factors only reported in one study.**

Study	Risk factor	<i>r</i>
Okado et al. (2016)	Child anxiety	0.1
Balluffi et al. (2004)	Unexpected admission	0.29
Tremolada et al. (2013)	Cognitive difficulties	0.45
Shi et al. (2017)	Parental resilience	-0.27
Balluffi et al. (2004)	New trauma	0.21
Franck et al. (2015)	Optimism	-0.27
Franck et al. (2015)	Coping style – distraction/humour	0.06
Gizli Çoban et al. (2017)	Sibling donor	0
Hardy et al. (2008)	Calmness	-0.16 & -0.32
Karadeniz Cerit et al. (2017)	Satisfactory information from medical team	0.04
Karadeniz Cerit et al. (2017)	Supportive/empathic medical team	0.10
Kubota et al. (2016)	Child IQ	0.2
Kubota et al. (2016)	Parental quality of life	-0.61
Landolt et al. (2005)	Threat appraisal	0.34 & 0.51
Landolt et al. (2005)	Medication compliance	0.37 & 0.18
Naderi et al. (2012)	Family history of malignancy	0.05
Nakajima-Yamaguchi et al. (2016)	Parent-child communication about disease	-0.06
Pasterski et al. (2014)	Genital ambiguity	-0.06
Pasterski et al. (2014)	Confusion/disbelief	0.58
Phipps	Parent rated PTSD	0.54
Shi et al. (2017)	Only child	0.38

Appendix Q – Funnel plot assessing publication bias for prevalence data

