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Post-traumatic stress disorder following childbirth: an update of current issues and recommendations for future research

For Peer Review Only

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Abstract

Objective: This paper aimed to report the current status of research in the field of post-traumatic stress disorder following childbirth (PTSD FC), and to update the findings of an earlier 2008 paper. **Background:** A group of international researchers, clinicians and service users met in 2006 to establish the state of clinical and academic knowledge relating to PTSD FC. A paper identified four key areas of research knowledge at that time. **Methods:** Fourteen clinicians and researchers met in Oxford, UK to update the previously published paper relating to PTSD FC. The first part of the meeting focused on updating the four key areas identified previously, and the second part on discussing new and emerging areas of research within the field. **Results:** A number of advances have been made in research within the area of PTSD FC. Prevalence is well established within mothers, several intervention studies have been published, and there is growing interest in new areas: staff and pathways; prevention and early intervention; impact on families and children; special populations; and post-traumatic growth. **Conclusion:** Despite progress, significant gaps remain within the PTSD FC knowledge base. Further research continues to be needed across all areas identified in 2006, and five areas were identified which can be seen as 'new and emerging'. All of these new areas require further extensive research. Relatively little is still known about PTSD FC.

Keywords:

PTSD; childbirth; review; theory; research

Introduction

There is now substantial empirical work showing that a proportion of women develop post traumatic stress disorder (PTSD) following childbirth, with potentially wide ranging consequences for them and their families (Fenech & Thomson, 2014). To date, research has focused on the proportion of women affected, risk factors for the development of PTSD following childbirth, and its impact on women. In contrast, there has been relatively little research into prevention, assessment and intervention. In 2006 an international group of researchers, clinicians and user-group representatives met to discuss the status of knowledge and formulate recommendations for research into PTSD following childbirth. Recommendations were made for research into (1) prevalence and comorbidity of PTSD after birth; (2) screening and treatment; (3) diagnostic and conceptual issues and (4) theoretical issues (Ayers, Joseph, McKenzie-McHarg, Slade & Wijma, 2008).

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4 Research and understanding of PTSD following childbirth has increased considerably
5 since that time. In 2014 a small meeting of researchers and clinicians from the UK
6 and Europe was held with the aims of discussing progress in research, and
7 considering key gaps in current understanding (see Appendix for a list of
8 participants). The meeting focused on updating the four primary areas discussed in
9 2006 and identifying promising areas of developing knowledge.
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15 This paper provides a summary of discussions at this meeting and aims to update
16 our understanding of PTSD following childbirth and recommendations for research.
17 The paper is in two sections. The first considers how research has developed in the
18 areas originally considered in 2006. The second considers emerging areas for
19 research identified as: (1) staff and pathways; (2) prevention and early intervention;
20 (3) impact on families and children; (4) special populations; and (5) post-traumatic
21 growth. As in the previous paper, discussions were based on the knowledge of
22 individuals attending, and the multidisciplinary nature of the group means a variety of
23 views were represented. This paper is not a systematic review but represents the
24 discussions on the day, and an overview of issues raised by participants.
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32 A number of themes arose in most discussions. It was acknowledged that childbirth,
33 when experienced as traumatic, may differ from other potentially traumatic events
34 due to its socially positive connotations, the need to consider at least two individuals
35 at all times (mother and baby), the liminal nature of pregnancy and birth, that the
36 event takes place within the context of formal care, and the potential issues for the
37 mother of caring for a baby who may be a reminder of the trauma. This has
38 implications for labelling, measurement, comparability with other populations with
39 PTSD, and applicability of PTSD research into the context of traumatic birth. Another
40 issue commonly arising was whether traumatic experiences of childbirth should be
41 conceptualised as a diagnostic category or a continuum of distress. These issues are
42 considered further in the sections on conceptual issues and theory.
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50 **Section 1: Update on research areas outlined by Ayers et al., 2008**

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53 This section presents the groups' discussions on the four topics considered in the
54 previous paper (Ayers et al, 2008), updating the current knowledge base and
55 identifying ongoing research where applicable.
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Prevalence and Comorbidity

The 2008 paper identified three issues within this topic: prevalence; course of PTSD; and methodological issues to be considered. The prevalence of PTSD following childbirth has been widely examined and meta-analyses of this research suggest it is 3.1% in all postnatal women and 15.7% in high risk groups (Grekin & O'Hara, 2014). Since 2006, there has been an increase in research examining prevalence in other groups, such as fathers, specific populations (such as those experiencing stillbirth), and staff, all of which provide some evidence that PTSD following childbirth (PTSD FC) can occur within these groups. Because of the relatively smaller numbers of studies that focus on these groups, reported prevalence rates vary and more research is needed. The implications of the new diagnostic criteria in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5, APA, 2013) are unknown at present as all published research thus far has been conducted using DSM-IV criteria.

The natural course of PTSD FC is still poorly understood, and research needs to chart incidence, severity, duration and recovery phases utilising longitudinal methods. Comorbidity with depression is known to be high, with reported rates from 20-75% (Stramrood et al., 2011; White, Matthey, Boyd & Barnett, 2006). However, comorbidity with other mental health problems is unknown. Differentiating between PTSD FC and postnatal depression (PND) is not straightforward as several symptoms overlap.

Methodological issues in this area remain largely unchanged. Robust measures are needed, adapted to the perinatal period, to ensure that women are being appropriately identified as having PTSD FC. Research using clinical interviews remains rare and usually reports lower prevalence rates (Grekin & O'Hara, 2014). There are very few studies looking at long-term outcomes after the first year.

Screening and Treatment

The 2008 paper considered screening, treatment and impact of PTSD on women and their families. Many of the issues outlined in 2008 remain. Screening for PTSD FC is not common in maternity care, and the disorder remains largely unrecognised outside specialist perinatal and/or maternity services. Research is needed to examine the context and process of screening as well as identifying appropriate tools. For example there are questions around when screening should take place, by

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3 whom, and what the best method might be of raising staff and patient awareness.
4 The process of screening can raise anxiety and hence it is important to administer
5 screening in an appropriate manner, and ensure that referral routes exist. The
6 course and onset of comorbid PTSD and depression is also unclear, although
7 clinicians in the group suggested PND is usually secondary to PTSD FC. It is also
8 important to consider symptom overlap with comorbid mental health issues, such as
9 depression or generalised anxiety, and how best to assess for these.
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15 Since 2008, a few studies have looked at interventions for women with PTSD FC.
16 These predominantly comprise case studies but suggest that PTSD treatments such
17 as CBT and EMDR are effective (Ayers, McKenzie-McHarg & Eagle, 2007;
18 Sandstrom, Wiberg, Wikman, Willman & Hogberg, 2008; Stramrood et al, 2012).
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23 The role of charities, service user groups and advocacy groups has gained
24 prominence in supporting the development of quality services providing input to
25 women and their families. For example, in the UK, the Maternal Mental Health
26 Alliance was set up as an umbrella advocacy group for organisations working within
27 the perinatal period. Their campaign for improved recognition and services was
28 launched in 2014 (see www.everyonesbusiness.org.uk). Internationally, there are
29 calls for maternal mental health to be fully integrated into maternity care (Rahman et
30 al., 2013). These and other initiatives provide an opportunity for PTSD FC to be
31 appropriately recognised.
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38 Diagnostic and Conceptual Issues

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41 The 2008 paper considered whether PTSD FC is the same as PTSD following other
42 events, and whether focus should be broadened to include other forms of distress.
43 Diagnostic issues remain paramount. To date, all published research utilises DSM-IV
44 criteria, which included somatic symptoms common in the postnatal population such
45 as 'difficulty falling or staying asleep', 'difficulty concentrating' and 'hypervigilance'.
46 This has issues for how we conceptualise, diagnose and screen for postnatal PTSD.
47 DSM-5 has changed how PTSD is classified and it is now a 'trauma and stressor-
48 related disorder' rather than an anxiety disorder. Event criteria have changed,
49 including the removal of the previous criterion A2 which specified that individuals
50 must respond to the traumatic event with intense fear, helplessness or horror. In
51 DSM-5 a cluster of symptoms has been added to include 'negative alterations in
52 cognitions and mood associated with the traumatic event(s)'. Symptoms such as loss
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3 of interest or participation in significant activities, persistent negative emotional state,
4 and inability to experience positive emotions could also be attributed to depression.
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8 These changes are critical and impact on the prevalence, conceptualisation and
9 diagnosis of PTSD FC. For example, two large studies (UK and Australia) suggest
10 the removal of A2 will increase prevalence rates of PTSD FC because many women
11 perceive a threat of injury or death during birth (Ayers, Harris, Sawyer, Parfitt, & Ford,
12 2009; Boorman, Devilly, Gamble, Creedy, & Fenwick, 2014). Research is therefore
13 needed to examine the implications and utility of DSM-5 criteria in comparison to
14 other diagnostic criteria, such as DSM-IV or ICD-10 (World Health Organisation,
15 2010).
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21 Another issue is the importance of recognising the impact of sub-threshold
22 symptomatology, particularly when broadening the focus on the full range of distress
23 rather than just diagnosis. Many women may not meet full caseness for a diagnosis
24 of PTSD, but clinically group members reported that this may still negatively impact
25 on their functioning, particularly if they are experiencing symptoms of re-
26 experiencing. Given the potential impact of PTSD on women and their families,
27 intervention remains important even where a diagnosis cannot be given if there is a
28 clear impact on levels of distress or functioning.
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34 35 Theoretical Issues 36

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38 Research in PTSD FC has been predominantly atheoretical, in that it has rarely been
39 explicitly based on theory. Careful consideration of relevant theories can contribute to
40 greater clarity of concepts and understanding of different explanations for PTSD
41 following childbirth. Theories of PTSD, stress, and specifically about PTSD FC are all
42 relevant. Theoretical mechanisms proposed to perpetuate symptoms of PTSD after
43 traumatic events include dysfunctional cognitions (Ehlers & Clark, 2000), memory
44 processes (Brewin, 2001; Ehlers & Clark, 2000), and negative social phenomena
45 (Charuvastra & Cloitre, 2008). Ehlers & Clark's (2000) theory proposes that PTSD
46 occurs if individuals process the event or its sequelae in a way which produces a
47 *sense of current threat*, with negative thoughts and cognitions about the event, and a
48 disturbance or block in memory processing (Ehlers & Clark, 2000). This model has
49 been applied to PTSD FC and found to be a good predictor of PTSD FC symptoms
50 (Ford, Ayers & Bradley, 2010; Vossbeck-Elsebusch, Freisfeld & Ehling, 2014).
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3 Relevant stress theories include those by Lazarus and Folkman (1984), who
4 emphasised the importance of appraisal in stress responses. Stress arises when
5 events are appraised as high threat and coping ability is perceived to be low.
6 Diathesis-stress frameworks account for the interaction between individual
7 vulnerability and events to determine outcome. Specific conceptual frameworks using
8 stress theories for perinatal populations have been proposed. Ayers (Ayers, 2004;
9 Ayers & Ford, in press) used a diathesis–stress framework to propose a model of
10 vulnerability and risk factors for PTSD following childbirth, and to summarise factors
11 that might be involved in the aetiology of the condition. Slade (2006) provided a
12 detailed conceptual framework which includes predisposing, precipitating, and
13 maintaining factors which relate to internal, external and interactional influences.
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21 Whilst the application of theory is increasing, there is still much to be done to
22 evaluate theoretical frameworks for PTSD FC. Greater application and testing of
23 existing PTSD theories to PTSD FC is needed, including exploration of proposed
24 mediating factors, such as memory processes involved in trauma memories, and how
25 they differ in women with and without PTSD following birth. Research is also needed
26 to extend the theories applied to childbirth. Theories thus far are mainly
27 psychological; however social theories and those from other disciplines may also be
28 relevant. For example, liminality theories, which understand birth as a rite of passage
29 (Kenworthy Teather, 2005; Parratt, 2008) may provide a different perspective.
30 Research should also examine the role of social bonds within the development of
31 PTSD between the woman, her caregivers, her partner and her infant as well as her
32 family and personal networks and the impact of these. A major role for attachment
33 theory in terms of adult attachment patterns as predisposing vulnerability factor is
34 also emerging (Iles et al 2011). Additionally, it would be valuable to see research on
35 high risk subgroups, such as stillbirth, being informed by theoretical frameworks.
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46 **Section 2: Important or emerging areas of research in PTSD FC**

47 Five important or emerging areas of research are focused on here: staff and
48 pathways, prevention and early intervention, impact on families and infant, special
49 populations, and post-traumatic growth.
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52 Staff and Care Pathways

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54 Evidence indicates that one significant cause of a woman's perception of birth as
55 traumatic is the actions/inactions of maternity staff, which can result in care being
56 experienced as dehumanising, disrespectful or uncaring (Elmir, Schmeid, Wilkes &
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3 Jackson, 2010; Goldbort 2009). Professionals' manner and communication can
4 significantly affect women's feelings of control during their delivery (Salter 2009) and
5 their ability to make informed decisions (Eliasson, Kainz & Von Post, 2008). Yet
6 choice, information and involvement in decisions are potentially protective against a
7 traumatic birth experience (Goodall, McVittie & Magill 2009). Therefore, professionals
8 need to understand that childbirth can be traumatic for women (Elmir et al., 2010);
9 acknowledge the role they may play and recognise the signs of psychological trauma
10 (Beck 2004). There is also evidence that increased empathy in staff can increase
11 their own risk of PTSD symptoms after witnessing traumatic childbirth events (Sheen,
12 Spiby & Slade, 2014).
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20 In some international contexts, there is a firm policy remit for the assessment of
21 psychological health and identification of perinatal mental health disorder in its
22 broadest sense (eg NICE, 2007; Beyond Blue 2011; Rahman et al., 2013) which
23 assumes that improved detection and assessment leads to improved outcomes. At
24 present this relationship is neither proven nor likely to be linear. Across the spectrum,
25 perinatal mental health detection, treatment and referral remains seriously lacking, is
26 inconsistent and requires attention (Goodman & Tyler-Viola 2010; NSPCC 2013;
27 Jomeen & Martin 2014).
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33 Routine questioning in clinical practice to elicit trauma symptoms requires
34 appropriate and available measures (Alderdice et al., 2013). However, these are
35 often not consistently utilised or applied (Rowan, McCourt & Bick 2010). Several
36 authors propose flexible questioning to facilitate broader consideration of the
37 comorbidities of psychological and complex psychosocial factors (Dennis, Janssen &
38 Singer, 2004; Robertson, Grace, Wallington & Stuart 2004), which might be more
39 relevant to the PTSD FC context.
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45 Clinical guidelines refer to PTSD FC pathways for care that appear to be outside the
46 maternity context. The result of this might be that practitioners feel less informed
47 about PTSD FC but also unclear about referral and management options. Lack of
48 training has been identified as a core barrier to addressing issues of perinatal mental
49 illness (Byatt, Moore-Simas, Lundquist Johnson, Ziedonis, 2012). Available and
50 accessible pathways for care and onward referral are also critical for confident
51 practitioner identification and assessment. Evidence highlights that midwives
52 (Jomeen, Glover & Davies 2009), health visitors (Jomeen, Glover, Jones, Garg &
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3 Marshall 2013) and obstetricians (Leddy, Hagga, Gray, Schulkin, 2011) are reluctant
4 to ask women about psychological issues when pathways are not evident.
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8 Deficient care may be a consequence of numerous factors, including
9 psychopathology, time, effective screening measures, referral options or lack of
10 knowledge (Matthey & Ross-Hamid 2011). Research is needed to evaluate care
11 pathways and training interventions, with reference to sensitive care, effective
12 identification, assessment and management of PTSD FC.
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15 16 17 Prevention and Early Intervention

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20 At present, published research on the prevention of PTSD FC is scarce. Most
21 available evidence is on midwife-led postnatal debriefing which suggests women
22 appreciate debriefing but there is inconsistent evidence on whether it reduces
23 symptoms of PTSD FC or depression (Baxter, McCourt & Jarrett, 2014; Borg Cunen,
24 McNeill & Murray, 2014; Peeler, Chunt, Stedmon & Skirton, 2012). A less
25 standardised “postnatal discussion”, in which a woman has the opportunity to
26 evaluate the course of labour and delivery, to ask questions and to voice her opinion
27 to a trained professional, is recommended for women who wish to talk about their
28 experiences (NICE, 2007).
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35 A recent RCT of trauma-focused CBT for mothers of preterm infants found a
36 reduction in symptoms of PTSD, depression and anxiety at 1 and 6 months (Shaw,
37 St John, Lilo, Jo, Benitz, Stevenson & Horwitz, 2014). Ongoing research in this area
38 is examining a number of potential prevention strategies, such as a system of
39 identifying high risk women and training staff to provide empathic care (McKenzie-
40 McHarg, Crockett, Olander & Ayers, 2014).
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46 Prevention can address a variety of factors, some of which are outlined in previous
47 sections, such as staff training and systemic interventions aimed at whole maternity
48 systems. Prevention strategies targeted at women could include early identification
49 of vulnerable women, additional targeted support from midwifery and psychological
50 services, ensuring compassionate care in labour and interventions early in the
51 postnatal period such as postnatal discussion which could encourage women to
52 process any traumatic experience and have the possibility of reducing later
53 symptoms. Any such interventions should also be aimed at changing factors that
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3 play a role in women's appraisals, including the need for maternity staff to create
4 realistic expectations of delivery.
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8 One example of an intervention which aims to address the need for realistic
9 expectations is that of a 'birth flow chart' rather than a 'birth plan', with different
10 pathways for 'what if labour starts with induction / preterm / ends with caesarean
11 section' etc. (Thomson & Downe, 2010). It is important that approaches to birth
12 consider a range of possible processes and outcomes, rather than focusing on a
13 single expected outcome which can result in women going into labour with an
14 idealistic picture of natural childbirth (Frost, Pope, Liebling & Murphy, 2006).
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20 The group acknowledged the need to map current perinatal provision, in order to
21 understand the messages women are receiving antenatally, but also during and after
22 delivery. A number of researchers have explored the role of support antenatally and
23 in labour (Iles, Spiby & Slade, 2013) and this work is continuing.
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28 Despite increasing knowledge of PTSD FC, very few professional support services
29 are available to help women postnatally or prior to a subsequent birth (Thomson &
30 Downe 2008). Limited fear of childbirth interventions exist within maternity services,
31 emerging from the premise that fear in childbirth is both a consequence of (Elmir et
32 al., 2010) and a risk factor for trauma symptoms (Otley, 2012; Fisher, Hauck &
33 Fenwick 2006). Despite a somewhat inconsistent evidence base (Otley, 2012) these
34 offer one pathway of care for PTSD FC.
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40 For future clinical and research purposes, strategies for early intervention may be
41 adapted from studies in other trauma populations. The optimal timing of treatment
42 and intervention for PTSD FC remains a topic of debate. Intervening in the very early
43 postnatal period may have the potential to pathologise and disrupt normal cognitive
44 mechanisms of adjustment. It potentially disregards the fact that most women do *not*
45 develop long term trauma responses following a difficult delivery. However, as 9-14%
46 of women report labour as traumatic (Boorman et al., 2014; Stramrood et al., 2011) a
47 further approach could involve staff offering these women appropriate referral.
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52 53 Impact on Families and Infants

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56 Traumatic birth may have negative implications for maternal and infant health,
57 reproductive choices and relationships with infants and partners. Recent meta-
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3 syntheses highlight the emotional impact on women, with reports of anger, self-
4 blame, suicidal ideation, loss of positive affect, isolation and dissociation from others
5 (Elmir et al., 2010; Fenech & Thomson, 2014). Future reproductive choices may be
6 affected, with women delaying or avoiding future pregnancies due to fear. In extreme
7 cases this can lead to women contemplating sterilisation (Fenech & Thomson, 2014).
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12 Women's relationships may also be affected. Qualitative research suggests women
13 can struggle to form a positive relationship with their infant (Elmir et al., 2010; Fenech
14 & Thomson, 2014), although the role of comorbid depression is unclear (Davies,
15 Slade, Wright & Stewart, 2008; Parfitt & Ayers, 2009). PTSD FC can negatively
16 impact on relationships with partners; avoidance of sex and intimacy are common
17 due to fear of conception and triggering PTSD symptoms (Elmir et al., 2010; Fenech
18 & Thomson, 2014). Studies of male partners show high levels of co-morbidity within
19 couples and men's PTSD responses may affect the mental health of their partner
20 (Iles, Slade & Spiby, 2011). Men also report PTSD responses (Stramrood et al.,
21 2013; White, 2007), but evidence of the scope of these is mixed (Bradley and Slade
22 2008). Similarly impact is not clearcut. For example, Parfitt and colleagues found that
23 although PTSD was associated with a worse self-reported parent-baby bond (Parfitt
24 & Ayers, 2009) it was not associated with an observational measure of parent-infant
25 interaction (Parfitt, Pike & Ayers, 2013a).
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30 The long-term impact on infants is not well evidenced. Qualitative research suggests
31 women might have difficulties bonding and/or avoid breastfeeding (Beck & Watson,
32 2008), which can have long-term health implications for infants (Horta, Bahl, Martines
33 & Victora, 2007; Ip et al., 2007). Longitudinal studies of the impact of PTSD on
34 infants suggest symptoms may be associated with parenting stress at two years, but
35 do not affect mothers' perceptions of their infant (McDonald, Slade, Spiby & Iles,
36 2011). A study of infant development found PTSD FC was associated with poor
37 cognitive development at 17 months of age (Parfitt, Pike & Ayers, 2013b).
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42 Conclusions about the impact of PTSD on the mother-baby relationship, couple's
43 relationship and child development remain tentative because of the limited evidence
44 available. Whilst there is substantial qualitative research showing a traumatic birth
45 can have a wide-ranging impact on women and their families, more quantitative
46 research is needed to confirm and extend these findings. In particular, prospective
47 studies with larger, representative samples are needed to establish the extent and
48 nature of the impact of PTSD on the couple's relationship and infant development.
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3 impact of trauma on infant's developmental outcomes within term, pre-term and
4 vulnerable population groups (e.g. bereaved or abused mothers); the course and
5 impact of male partners' PTSD responses; the combined effect of co-morbidity
6 (particularly depression) on familial relationships; other birth partners (i.e
7 grandparents, sisters); as well as the intergenerational implications of trauma.
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10 11 12 Special Populations

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15 High-risk populations are increasingly focused on, including women with pre-
16 eclampsia, preterm or stillbirth. Here we consider stillbirth and preterm birth.
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19 20 *Stillbirth*

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23 The global prevalence rate of stillbirths (in the UK, a baby born after 24 weeks with
24 no signs of life) is 2.64 million (Cousens et al., 2011). Most research has focused on
25 the psychological impact of stillbirth on parents and the wider family system,
26 highlighting grief, loss of self-esteem, and feelings of worthlessness, isolation, shame
27 and guilt (Cacciatore, 2010). Depression, anxiety, PTSD and traumatic grief have
28 also been reported (Campbell-Jackson & Horsch, 2014).
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34 As understanding about care after stillbirth has developed, there is a need to
35 disentangle traumatic grief and post traumatic stress at a conceptual level. The
36 International Society for Traumatic Stress Studies describes traumatic grief as the
37 sudden and unexpected death of a significant other – usually a close family member.
38 While many of the symptoms of traumatic grief overlap with PTSD, the core
39 symptoms of traumatic grief are an unquenchable yearning or longing for the dead
40 person that preoccupies much of a person's waking life. It is not typical to
41 experience reliving or avoidance phenomena in the way that those experiencing
42 PTSD do. There is very little research which aims to disentangle the two, and only a
43 small number of studies examine both PTSD and traumatic grief within the same
44 cohort (Campbell-Jackson & Horsch, 2014; Horsch, McKenzie-McHarg & Jacob, in
45 press)
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54 Guidelines surrounding maternal contact with the stillborn infant have been
55 contradictory (NICE, 2007) and evidence as to whether seeing and holding the
56 stillborn baby is associated with maternal anxiety and depressive symptoms has
57 been inconclusive. A recent study on the maternal experience of this contact found
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3 that the majority felt satisfied with their decision to see or hold their stillborn (Ryninks,
4 Collins, McKenzie-McHarg & Horsch, 2014) and another emphasised the importance
5 of sharing memories of the stillborn baby to aid psychological adjustment (Crawley,
6 Lomax & Ayers, 2013). Efforts have increased to better understand the risk factors
7 and predictors of traumatic grief after stillbirth (Crispus-Jones, McKenzie-McHarg &
8 Horsch, under review), but more are needed. Recent studies have focused on the
9 impact of stillbirth on antenatal attachment during the subsequent pregnancy and on
10 parenting a subsequent child (Campbell-Jackson, Bezance & Horsch, under review;
11 Lee & Horsch, under review).

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18 Most research to date has grouped together all forms of perinatal loss and the
19 psychological impact of early versus late loss requires further clarification. More
20 longitudinal studies and those using validated measures and incorporating diverse
21 samples are needed. More research examining the impact of changes in guidelines
22 and care offered to bereaved parents linked with psychological theory should be
23 encouraged.

24 25 26 27 28 29 *Preterm Birth*

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32 Preterm birth (prior to 37 weeks gestation) is the most important determinant of
33 adverse outcome in terms of survival, quality of life, psychosocial and emotional
34 impact on the family and costs for health services. In Europe the preterm birth rate
35 for live births ranges from approximately 5% to 11% (Zeitlin et al., 2013). PTSD and
36 depression in pregnancy are also associated with an increased risk of preterm birth
37 (Yonkers, Smith, Forray, Epperson, Costello, Lin & Belanger, 2014).

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42 Preterm birth and hospitalisation of the baby can be a distressing time for parents.
43 Research on psychological adjustment following preterm birth has focused on
44 depression and anxiety. Fewer studies have explored maternal trauma reactions.
45 Studies report high and persistent rates of PTSD (Elkit, Hartvig, & Christiansen,
46 2007; Forcada-Guex, Borghini, Pierrehumbert, Anserment, & Muller-Nix, 2011; Jotzo
47 & Poets, 2005; Misund, Nerdrum, Bratten, Pipp, & Diseth, 2013). Associations
48 between PTSD symptoms, a poor mother-infant relationship, and adverse infant
49 outcomes have also been reported (Feeley et al., 2011; Forcada-Guex et al., 2011;
50 Pierrehumbert, Nicole, Muller-Nix, Forcada-Guex & Anserment, 2003).

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3 More studies are needed to identify risk factors for traumatic stress responses
4 following preterm birth. Current research suggests a higher level of prematurity, low
5 social support, dysfunctional coping, preeclampsia, bleeding in pregnancy, and
6 intraventricular hemorrhage in babies associated with higher levels of PTSD
7 symptoms (Misund et al., 2013; Shaw, Bernard, Storfer-Isser, Rhine, & Horwitz,
8 2013; Suttora, Spinelli, & Monzani, 2014). There is a higher incidence of preterm
9 birth in certain ethnic groups and in women from very deprived areas (Aveyard,
10 Cheng, Manaseki, & Gardosi, 2002; Smith, Draper, Manktelow, Dorling & Field,
11 2007). However, most research exploring PTSD has been conducted with White,
12 married, highly educated mothers and research is needed with more diverse groups.
13 Finally, guidelines for screening for trauma symptoms in mothers of preterm infants
14 are absent. As there are currently no clear maternal or infant predictors, one option is
15 to screen all mothers of preterm infants (Shaw et al., 2014).
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24 **Post-Traumatic Growth**

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26 Research on psychological adjustment following childbirth has predominantly
27 focused on negative outcomes, and positive outcomes have been relatively ignored.
28 A positive outcome that may be particularly relevant to birth is personal growth.
29 Growth is defined as positive change resulting from struggle with challenging events
30 (Tedeschi & Calhoun, 1996) and has been variously conceptualised as 'benefit-
31 finding', 'thriving' and 'posttraumatic growth' (PTG).
32 Evidence that positive outcomes and growth occur after birth is increasing. A
33 population survey of 5333 women found that approximately one third reported a
34 positive outcome after birth (Henderson & Redshaw, 2013). Qualitative research on
35 women's experiences following traumatic births supports this with positive outcomes
36 such as a sense of strength or purpose being reported (Beck & Watson, 2010;
37 Thomson & Downe, 2010; Thomson & Downe, 2013; Elmir et al., 2010).
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46 Very few studies have examined growth directly using validated instruments such as
47 the posttraumatic growth inventory (PTGI). The PTGI measures five areas: New
48 Possibilities, Relating to Others, Personal Strength, Spiritual Change, and
49 Appreciation of Life. Studies confirm that approximately 50% of women report at least
50 moderate levels of growth, and scores are broadly comparable to other samples e.g.
51 after accidents (Sawyer & Ayers, 2009). Women report most growth in the
52 Appreciation of Life and Personal Strength domains, and the least in the Spiritual
53 Change domain (Sawyer & Ayers, 2009; Sawyer, Ayers, Young, Bradley, & Smith,
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3 2012; Taubman-Ben-Ari, Findler, & Sharon, 2011). More growth is reported by
4 women with more difficult circumstances e.g. mothers of preterm babies (Spielman &
5 Taubman-Ben-Ari, 2009), women who have PTSD in pregnancy or caesarean
6 section births (Sawyer et al., 2012).
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11 However, research on growth following childbirth is limited and important gaps
12 remain around conceptualisation and measurement, predictors, and how growth can
13 be incorporated into clinical interventions. Conceptually, the relationship between
14 growth and resilience is unclear (Westphal & Bonanno, 2007). The applicability and
15 validity of measures of growth with postnatal women needs to be explored further
16 (Taubman-Ben-Ari et al., 2011). More qualitative research is needed to provide
17 insights into the nature of positive changes following childbirth.
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23 Finally, although the literature is equivocal regarding the relationship between growth
24 and distress, a number of notable longitudinal studies in non-obstetric populations
25 have found that growth following a stressful event is predictive of better emotional
26 adjustment in the long term (e.g. Danoff-Burg & Revenson, 2005; Frazier, Conlon &
27 Glaser, 2001), and there are promising studies integrating growth into clinical
28 interventions (Roepke, 2014). However, before growth can be recommended as a
29 viable therapeutic option for women with PTSD FC more prospective and longitudinal
30 studies are needed to understand the relationship between growth and distress.
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36 **Summary**

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38 This paper provides an update of Ayers et al. (2008) and reports on the four primary
39 areas identified then. In addition, five further areas of research are discussed which
40 we consider important in PTSD FC research. This paper highlights areas in which our
41 understanding of PTSD has increased, as well as those where more research is
42 needed. These include a wide range of issues, such as the development of robust
43 measures for the identification of risk factors and PTSD FC, as well as consideration
44 of sub-threshold symptomatology. The evaluation of theoretically informed insights
45 into PTSD FC are needed, as well as exploration into the potential for positive
46 outcomes. Longitudinal studies are required to assess prevalence, intensity and
47 severity of PTSD as well as impact on mothers, infants, fathers and others within
48 diverse population groups. Further areas that require consideration concern the
49 integration of PTSD FC within maternity care pathways together with suitable training
50 for maternity professionals, alternative approaches to prepare mothers for childbirth
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and further testing to identify the timing of and suitable and effective intervention approaches.

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Appendix 1: participants

Susan Ayers

Ros Crawley

Elizabeth Ford

Antje Horsch

Jane Iles

Julie Jomeen

Kirstie McKenzie-McHarg

Aimee Poote

Alexandra Sawyer

Geraldine Scott-Heyes

Kayleigh Sheen

Pauline Slade

Claire Stramrood

Gill Thomson