Abstract

Objective: this study examined factors associated with symptoms of post-traumatic stress (PTS) following childbirth in women with normal, low-risk pregnancies in Nigde, Turkey.

Design: a prospective longitudinal design where women completed questionnaire measures at 20+ weeks' gestation and 6-8 weeks after birth.

Setting: Eligible pregnant women were recruited from nine family healthcare centres in Nigde between September 2013 and July 2014. **Participants**: A total of 242 women completed questionnaires at both time points. **Measures**: PTS symptoms were measured using the Impact of Event Scale-Revised (IES-R) 6-8 weeks after birth. Potential protective or risk factors of childbirth self-efficacy, fear of childbirth, adaptation to pregnancy/motherhood, and perceived social support were measured in pregnancy and after birth. Perceived support and control during birth was measured after birth. Demographic and obstetric information was collected in pregnancy using standard self-report questions. **Findings**: PTS symptoms were associated with being multiparous, having a planned pregnancy, poor psychological adaptation to pregnancy, higher outcome expectancy but lower efficacy expectancy during pregnancy, urinary catheterization during labour, less support and perceived control in birth, less satisfaction with hospital care, poor psychological adaptation to motherhood and increased fear of birth postpartum. Regression analyses showed the strongest correlates of PTS symptoms were high outcome and low efficacy expectancies in pregnancy, urinary catheterization in labour, poor psychological adaptation to motherhood and increased fear of birth postpartum. This model accounted for 29% of the variance in PTS symptoms.

Conclusions: This study suggests women in this province in Turkey report PTS symptoms after birth and this is associated with childbirth self-efficacy in pregnancy, birth factors, and poor adaptation to motherhood and increased fear of birth postpartum. **Implications for practice:** Maternity care services in Turkey need to recognise the potential impact of birth

experiences on women's mental health and adaptation after birth. The importance of self-efficacy in pregnancy suggests antenatal education or support may protect women against developing postpartum PTS, but this needs to be examined further.

Key Words: childbirth, pregnancy, post-traumatic stress disorder, mental health, postpartum.

Factors associated with post-traumatic stress symptoms following childbirth in Turkey

Childbirth is a challenging experience for many women and it is now recognized that a small proportion of women may perceive birth as traumatic and develop post-traumatic stress disorder (PTSD) as a result. Others may experience severe symptoms of post-traumatic stress (PTS) that are distressing but do not reach threshold for a diagnosis of PTSD (Alcorn et al., 2010; O'Donovan et al., 2014). PTS therefore affects a larger number of women. A difficult or complicated birth can lead to the development of PTS if a woman believes her life or her baby's life is in danger during birth and she feels intense fear, helplessness and horror (American Psychiatric Association, 2000). Symptoms of PTS include intrusive thoughts, flashbacks and nightmares, emotional numbing, avoidance of reminders of the birth, and hyper-arousal such as irritability (APA, 2000). Loss of control, feeling trapped, and vivid memories of the event have also been noted as experiences and perceptions of women after a difficult or traumatic childbirth (Elmir et al., 2010; Goldbort, 2009). Although the disorder of PTSD is clearly defined in diagnostic nomenclature there is controversy over recent revisions to the diagnostic criteria (Hoge et al., 2016). PTS is defined and measured in different ways but a common approach is to use established cut-offs on measures of the frequency of symptoms from non-diagnostic measures, such as the Impact of Event Scale (Horowitz, Wilner & Alvarez, 1979). Measures of PTS are highly associated with PTSD but are not completely aligned.

Studies have reported a range of prevalence rates of PTS after birth. Differences in prevalence are likely to be due in part to the cultural context and health care system of the country in which it is studied (Garthus-Niegel et al., 2013; Modarres et al., 2012; Grekin & O'Hara, 2014). A large study of women in Norway reported that 1.8% of women had severe PTS following childbirth (Garthus-Niegel et al., 2013). In contrast, a study in Iran found that

20% of women had severe PTS following childbirth (Modarres et al., 2012). A meta-analysis of PTS after birth suggested that the average prevalence of birth-related PTS/PTSD is 3.1% in general population and this increases to 15.7% in high risk samples, such as women who develop severe complications in pregnancy (Grekin & O'Hara, 2014).

PTS following childbirth usually arise as a result of complications during pregnancy or birth (Andersen et al., 2012; Grekin, & O'Hara, 2014). Reviews and meta-analyses provide fairly consistent evidence that medical complications or interventions, such as emergency caesarean section, are associated with PTS. However, women's *subjective experience* of birth as negative and traumatic is more strongly associated with PTS (Ayers et al., 2014; Boorman et al., 2014; O'Donovan et al., 2014; Andersen et al., 2012; Verreault et al., 2012). It should also be noted that PTS is not only the result of a traumatic birth but that other factors can make women more vulnerable or at risk of developing PTS (Ayers et al., 2016). For example, fear of childbirth during pregnancy puts a woman at greater risk of developing PTS in response to the subsequent birth (Ayers et al, 2016). Psychopathology in pregnancy, such as symptoms of depression and anxiety, are also significantly associated with PTS following childbirth (Grekin & O'Hara, 2014; Ayers et al, 2016).

One potential risk factor for PTS following childbirth that has not been widely examined is low childbirth self-efficacy. Self-efficacy relates to people's beliefs about their capability to influence events that affect their lives. Self-efficacy beliefs can affect how people feel, think, motivate themselves and behave (Bandura, 1994). Childbirth is fundamentally a physiological process, but a woman's thoughts and feelings may directly affect the labour and birth. There is some evidence that self-efficacy for labour and birth is associated with less anxiety about birth and greater perception of control during birth (Sieber et al., 2006). Conversely, research suggests that women with low birth self-efficacy are more likely to have fear of childbirth (Salomonsson, Berterö, Alehagen, 2013).

Care during childbirth can therefore be influential in reducing or increasing the impact of traumatic events. There is now substantial evidence to suggest that support from health professionals during birth can reduce the impact of traumatic or negative experiences. For example, an experimental study that used birth stories to manipulate levels of support and stress during birth, Ford & Ayers (2009) found that support from healthcare professionals was as, or more, important than the events of birth, particularly for women's perception of control during birth. Other studies have shown an association between perceived support, greater perceptions of control, and less anxiety during childbirth (Ford, Ayers, Bradley, 2010; Hodnett et al., 2012; Vossbeck-Elsebusch, Freisfeld, & Ehring, 2014; Verreault et al., 2012). Similarly, meta-analyses have found that postpartum PTS symptoms were associated with poor quality of interaction with health care staff, less feelings of control during birth (Grekin, & O'Hara, 2014), and less support during birth (Ayers et al., 2016). Conversely, good support and women being satisfied with the support they received from healthcare professionals and their partners is associated with a reduced likelihood of developing PTS symptoms following childbirth (Lemola, Stadlmary, & Grob, 2007; Iles, Slade, & Spiby, 2011).

According to theoretical models of PTS in other populations, access to adequate social support is important to facilitate cognitive processing and assimilation or accommodation of a traumatic event (Brewin, Dalgleish & Joseph, 1996). In relation to perinatal women, Gamble and Creedy (2009) argue that social support is instrumental in women's adjustment and psychological wellbeing after birth.

Qualitative research suggests the impact of PTS on women and their families is substantial (Ayers, Eagle, & Waring, 2006; Parfitt, & Ayers, 2009; Nicholls & Ayers, 2007; Reynolds, 1997). Clinical guidelines and researches for postnatal mental health emphasize that "even subthreshold symptoms can affect a woman's general functioning and the development of her infant" (NICE, 2007, p.39; Ejaz, 2014). Therefore, regardless of

diagnosis, PTS may have negative consequences for the emotional well-being of postpartum women and their relationships with their baby and husband/partner (Ayers, Eagle, & Waring, 2006; Parfitt, & Ayers, 2009; Nicholls & Ayers, 2007; Reynolds, 1997). This qualitative research also suggests PTS resulting from traumatic birth experiences may affect the mother-baby relationship in a number of ways. For example, if the mother associates the baby with the traumatic events in birth she might try to avoid contact with the baby (Reynolds, 1997; Elmir et al., 2010). Alternatively, she may become over-anxious about the baby (Ayers, Eagle, & Waring, 2006; Nicholls & Ayers, 2007).

It is therefore important to identify key protective and risk factors for PTS following childbirth. Although there is an increasing body of research focusing on risk factors for PTS following childbirth, it is not clear whether these are generalizable between cultures (Ayers et al., 2008). Most of the available evidence on risk factors comes from Europe, Australia and North America (Grekin, & O'Hara, 2014; Ayers et al., 2016). Cultural variations in healthcare systems and customs around pregnancy and birth mean that there is likely to be variation in both prevalence and risk factors for PTS – particularly in low and middle income countries. A review of common mental health problems in pregnancy and after birth in low and middle income countries found higher prevalence than usually reported in high income countries (Fisher et al., 2012; Ejaz, 2014). Turkey is a middle income country where reformative initiatives have been introduced and implemented over the past 10 years in the healthcare system. Very little research has been conducted in Turkey into women's perinatal mental health and no research has examined PTS after birth. Research is therefore needed to examine PTS after birth and potential protective and risk factors for Turkish women.

This study therefore aims to examine protective and risk factors for postpartum PTS for women who have a healthy pregnancy and birth process by conducting a prospective longitudinal study from pregnancy to 6 to 8 weeks after birth. Specifically, the goals of the

present study were to (1) examine the relationship between PTS after birth and prenatal factors of adaptation in pregnancy, birth self-efficacy, and fear of childbirth; (2) examine the relationship between PTS after birth and potential protective factors of support and control during birth, and support after birth; (3) examine the relationship between PTS after birth, poor postpartum adaptation, and postpartum fear of birth.

METHOD

Design

A prospective longitudinal questionnaire study that examined PTS and selected protective or risk factors in women during pregnancy and after childbirth. Women completed questionnaire measures of risk factors during pregnancy at >20 weeks gestation (Time 1; M = 35.04, SD = 4.13) and measures of birth factors and PTS six to eight weeks after childbirth (Time 2; M = 6.24, SD = 0.62).

Setting

The study was carried out in Niğde, Turkey. The population in Niğde is generally lower income compared to the average in Turkey. Maternity care is provided in family health centres and hospitals. Routine antenatal and postnatal care is provided by midwives/nurses and family physicians (general practitioners) in family health centres. If women require non-routine appointments or referral they are seen by obstetricians at the two local hospitals. If women have complications or are high risk they are referred to tertiary hospitals in the bigger cities (Ankara, Adana, Kayseri and Mersin) which have more advanced facilities. In family health centres usual prenatal care appointments take 10 to 15 minutes and consist of collecting medical information, conducting a physical examination and ultrasound scan by family physicians. Community midwives working in family health centres conduct follow-up appointments of women and their families in the preconception, pregnancy and postpartum periods. These midwives provide routine care, advice and education on pregnancy and birth.

Antenatal education classes are not part of routine care in this region of Turkey. Women usually give birth at one of the two local hospitals with a midwife and obstetrician in attendance. However, most women only meet their birth attendants for the first time when they come to hospital in labour.

This study was focused on examining protective and risk factors for postpartum PTS in women who have healthy pregnancy and labour. Inclusion criteria were therefore that women were 20+ weeks gestation; low-risk with no history of pregnancy complications, previous caesarean section, mental health disorders, or trauma exposure. Women also had to be able to communicate in Turkish. Women were excluded if their mothers had died.

The study was approved by the Research Ethics Committee of Nigde University and the Turkish Ministry of Health. All eligible pregnant women who attended routine antenatal appointments in nine family healthcare centres in Nigde were approached between September 2013 and July 2014. Recruitment and data collection were conducted by nine midwifery students from the School of Health who had taken an obstetrics course in their 4th year and volunteered to join the research study. These students were provided with a half-day training in research by the lead researchers. The lead researchers (GG, FI, MB) also supervised the data collection and provided feedback to students during the process. Women who met the inclusion criteria were informed about the aims of the study and what participation would entail, and asked if they would like to take part. The majority of the women agreed to participate in this research. Written consent was obtained from those who agreed to participate, after which women were asked to complete the first set of questionnaires in an interview with the students, which took an average of 45-90 minutes. Medical records were checked to ascertain when women gave birth. Women completed the second set of questionnaires six to eight weeks after birth either at the family healthcare centre or their

home during home visits in an interview with the students, which took an average of 60-90 minutes.

Participants

Pregnant women aged 18 to 49 years (M = 26.73, SD = 5.10) were eligible if they were more than 20 weeks gestation and had no pregnancy-related complications or previous caesarean section. Only women whose mothers were alive were included in the study because women whose mothers had died were unable to answer certain questions on the prenatal self-evaluation questionnaire (see Measures). Participants were recruited from nine different family healthcare centres. A total of 307 women were eligible to take part and were approached by the researcher. Only 37 women (12.05%) refused. All 270 remaining women agreed to be enrolled into the study and completed Time 1 measures (87.9% response rate). Time 2 was completed by 242 women (84.8% response rate). There were no significant differences between women who completed all measures and women who completed Time 1 measures only with regard to socio-demographics and obstetric characteristics.

Measures

Figure 1 gives an overview of the design, response rates and measures taken in pregnancy (T1) and after birth (T2). Measures were carefully chosen to be applicable to women in pregnancy and postnatally, and applicable to women in Turkey. These are outlined below.

PTS was measured using the Impact of Event Scale–Revised (IES-R), a 22-item scale that assesses three symptom clusters of PTS: intrusive thoughts (8 items), avoidance behaviours (8 items), and hyperarousal (6 items). The IES-R is based on the original 15-item IES (Horowitz, Wilner, and Alvarez, 1979) but has additional items to measure hyperarousal symptoms. Women were asked to answer all questions in relation to their experiences of childbirth. Items were rated on a 5-point scale according to how much women were distressed or bothered during the past seven days by each symptom listed. The scale has good reliability

in women who have recently given birth (α = .88; Olde et al., 2006). Psychometric properties of the Turkish version of the IES-R show very good internal consistency (α = .93; Corapcıoglu et al., 2006), which was also found in this study (α = .93). Although the IES-R does not measure full diagnostic criteria for PTSD the diagnostic sensitivity and specificity of the IES-R ranges from 92.2% to 74% and from 70.7% to 81% respectively, if the cut-off score is set between 24 and 33. A cut-off score of 30 or above was used in the present study, which has a positive and negative predictive value from 14.4 to 96.7 and from 98.8 to 32.8 respectively, for different prevalence rates of PTSD (5%, 20%, 50%, 90%; Corapcıoglu et al., 2006).

Adaptation to pregnancy and motherhood was measured using the Prenatal Self-Evaluation Questionnaire (PSEQ) and Postpartum Self-Evaluation Questionnaire (PPSEQ). The PSEQ was developed to measure psychological adaptation during pregnancy (Lederman and Lederman, 1979). The PSEQ uses a 4-point Likert scale. Cronbach's alpha coefficients for the scales have been reported to range from.75 to .94 (Lederman and Lederman 1979). Internal consistency is good in previous studies (α = .81; Beydağ & Mete, 2008) and the current study (α = .90). The postpartum PPSEQ was developed by Lederman, Weingarten, & Lederman (1981) to evaluate women's adaptation to being a new mother. It has 82-items and uses a 4-point Likert scale. Cronbach's alpha coefficient for the PPSEQ was .92 (Lederman, Weingarten, & Lederman, 1981). In Turkish samples the internal consistency of the scale is good (α = .87; Beydağ and Mete, 2007), which was also found in the current study (α = .93). For both scales higher scores mean poorer adaptation to pregnancy or motherhood.

Childbirth self-efficacy was measured using the Childbirth Self-Efficacy Inventory (CBSEI) short form, which has two subscales of Outcome expectancy and Efficacy expectancy (Ip, Tang & Goggins, 2008). Efficacy expectancy is a personal conviction that one can successfully perform required behaviours in a given situation during birth, and Outcome

expectancy is the belief that a given behaviour will lead to a given outcome of birth. Each subscale consists of 16 items and yields a score between 16 and 160. In each case, a higher score indicates a higher level of Outcome or Efficacy expectancy for birth. The CBSEI has been shown to be a psychometrically reliable measure with a high internal consistency (α = .82, Ip et al., 2008). Psychometric properties of the Turkish version of CBSEI were tested by Ersoy (2011) and internal consistency was similarly high (α = .90), although in the current study it was slightly lower (α = .72).

Fear of birth was measured using the Wijma Delivery Expectancy/Experience Questionnaires (WDEQ-A and WDEQ-B): The WDEQ-A (Wijma, Wijma & Zar, 1998) measures antenatal feelings and fears about childbirth by means of the woman's cognitive appraisal regarding the birth process. The WDEQ-A is a validated 33-item questionnaire with scores ranging from 'not at all' (0) to 'extremely' (5), giving a minimum score of 0 and a maximum score of 165. The WDEQ-A has good split-half reliability of .87 in nulliparous women and .96 in multiparous women (Wijma, Wijma & Zar, 1998). The scale was adapted for use with Turkish women by Korukcu, Kukulu and Firat (2012) and was reported to have good internal consistency (α = .89), which was also found in the current study (α = .89). The WDEQ-B is the same scale worded so that it can be completed after birth to assess fear of birth, feelings, and thoughts women may have after their childbirth. It has the same scoring and range as the WDEQ-A. On both scales a higher score indicates more intense fear of birth. Internal consistency and split-half reliability of the WDEQ-B are ≥ .87 for samples of both nulliparous and multiparous women (Wijma, Wijma, & Zar, 1998). A study exploring the validity and reliability of the Turkish translated version of the scale found the internal consistency to be very good (α = .89; Korukcu, Bulut, & Kukulu, 2014). This was also found in the current study (α = .94).

Support and control in birth was measured using the Support and Control in Birth Scale (SCIB; Ford, Ayers & Wright, 2009), which has 33 items and three subscales of: internal control (10 items), external control (6 items) and support from healthcare professionals (17 items). The SCIB uses a 5-point Likert scale with a possible range from 33 to 165. High scores indicate a higher degree of the perceived support and control in birth. The internal reliability of the SCIB has been found to be very good in both the English version (α=.95; Ford et al., 2009) and Turkish version (α=.89; XX et al., in press). In the current study, the internal reliability of the scale was .83.

Social support during pregnancy and after birth was measured using the Multidimensional Scale of Perceived Social Support (MSPSS; Zimet et al., 1988). The MSPSS is a 12-item scale designed to assess perceived social support. Each item is rated on a 7-point Likert scale, with higher scores indicating greater support. The internal consistency co-efficient of the scale ranges from α = .77 to .88 in the Turkish population (Eker, Arkar, & Yaldız, 2001). In this study, internal reliability for the MSPSS was very good (α = .91).

Demographic and obstetric information*:* Participants provided information on their age, education level, parity (1, 2, 3 etc.), number of children, planned pregnancy (0=no, 1=yes), number of abortions, number of intrauterine fetal deaths, gestation of current pregnancy, and expected date of delivery at Time 1. Birth details, including weeks since birth, type of delivery, length of labour, interventions on labour (amniotomy, enema, painful vaginal examination, urinary catheterization, oxytocin induction, type of anaesthesia) (0=no, 1=yes), complications related to labour and birth, and complications related to the newborn were collected at Time 2 along with women's satisfaction with the hospital and doctor/midwife at the hospital (1-5). Obstetric information was reported by women and in a few cases women did not have a clear recollection or knowledge about some of the obstetric events. If women

reported uncertainty or lack of knowledge about obstetric information their medical records were checked and obstetric information taken from there.

Statistical analyses

The distribution of the data was evaluated by using kurtosis and skew analyses. Most data were normally distributed. Of the demographic data, only the data of the number of abortions and stillbirths were skewed. These two variables were therefore not included in the model. The relationships between demographic, prenatal, birth-related and postnatal categorical variables with PTS were examined using Spearman's correlations. The relationships between scale means with PTS were examined using Pearson's correlations. Variables with a significant correlation were then entered into a forced entry hierarchical multiple regression analysis to ascertain which variables were most predictive of PTS. Variables were entered in blocks according to chronological occurrence with antenatal variables entered in the first step, birth variables in the second step, and postnatal variables in the final step. Model parameters were checked and calculated. The linear relationship between variables was evaluated by using collinearity statistics and there was no perfect linear relationship between variables of the model. For all analyses, a p value <.05 was used as the limit of statistical significance.

RESULTS

Sample characteristics

Demographics, obstetrics and childbirth characteristics for participants are shown in Table 1. Participants were on average 26.7 years old (SD = 5.1 years) with 53.3% graduated from primary school. Two fifths (39.7%) were primiparous and 88.8% were planned pregnancies. The majority of women in the study had a vaginal birth (65.7%) and the remaining women (34.3%) had a caesarean section. All caesarean deliveries were done under general anaesthesia. Assisted or instrumental births (i.e. forceps, ventouse) are not carried out in this

hospital. With regard to obstetric interventions during birth, 52.8% of the participants underwent an amniotomy, 21.4% enema, 95.0% continuous fetal monitoring, 98.1% vaginal examination that women rated as painful and 62.9% oxytocin induction. In the second phase of delivery, 26.4% of women had urinary catheterisation, 5.0% reported birth-related complications and 7.9% reported neonatal complications. Seventy two percent of participants stated that they were satisfied with their experience in the hospital and 79.3% were satisfied with their doctors/midwives. Socio-demographic variables (age and education level) were not related to PTS.

Relationship between risk and protective factors and PTS

PTS scores ranged from 0 to 77, with a mean score of 28.09 (SD = 18.73). Bivariate relationships between variables are shown in Table 2. PTS following childbirth had small but significant correlations with being multiparous, having a planned pregnancy, poor psychological adaptation to pregnancy, higher outcome expectancy but lower efficacy expectancy during pregnancy (r = -.11 to .20). During birth, PTS was associated with urinary catheterization, less perceived support and control, and lower satisfaction with hospital care (r = -.13 to -.23). After birth, PTS was associated with poor psychological adaptation to motherhood and increased fear of birth (r = .28 and .33 respectively). Fear of birth in pregnancy and perceived social support after birth were not significantly associated with PTS.

Multiple regression was conducted to examine the contribution of significant sociodemographic, prenatal, birth-related, and postnatal risk factors to PTS following childbirth. The final model was significant and explained 29% of the variance in PTS following childbirth (see Table 3). In this model, factors that remained strongly associated with PTS were high outcome and low efficacy expectancies in pregnancy, having urinary

catheterization in labour, increased postpartum fear of birth and poor psychological adaptation after birth ($p < .05$).

The linear relationship between variables in each model was evaluated by using the collinearity statistics. In these analyses, it is desired to have Variance Inflation Factor (VIF) to be lower than 10 and the tolerance value to be higher than 0.2. The VIF values for the model 1, 2 and 3 were; between 1.126 and 1.668, between 1.048 and 1.841 and between 1.099 and 2.442; respectively. The tolerance values for the model 1, 2 and 3 were; between 0.600 and 0.888, between 0.543 and 0.955 and between 0.410 and 0.955; respectively. These results show that there is no perfect linear relationship between variables.

DISCUSSION

The primary aim of this study was to prospectively examine potential protective and risk factors associated with PTS following childbirth in women in Turkey. In general, socio-demographic variables were not related to PTS following childbirth. The prenatal variables most strongly associated with PTS were self-efficacy regarding childbirth (low efficacy expectancy and high outcome expectancy). The current literature is inconclusive about the association between self-efficacy and PTS after childbirth (Ford, Ayers, & Bradley, 2010; Gauthus-Niegel et al., 2014). In keeping with the results of this study, Ford, Ayers, & Bradley (2010) found that low self-efficacy was associated with increased PTS three weeks and three months after birth. In contrast, Gauthus-Niegel et al. (2014) did not find a significant association between self-efficacy and PTS following childbirth. The present study extends this work by examining self-efficacy specifically related to childbirth and showed that having high expectations about the outcome of birth but low expectations about one's ability to influence that outcome was correlated with PTS after childbirth.

However, prenatal variables (including self-efficacy) only accounted for 11% of the variance in birth-related PTS so it is clear that other factors are important. The social,

medical, economic and emotional context of women giving birth in this province in Turkey is also likely to influence the way in which pregnancy and birth are experienced by individual women. For example, very few women in the sample had access to epidural anaesthesia and some of the interventions used are not evidence based, such as continuous fetal monitoring and high levels of oxytocin induction.

The birth-related variable most strongly associated with PTS following childbirth in this study was having urinary catheterisation. This is consistent with other research which has found that obstetric intervention during birth is related to PTS following childbirth (Andersen et al., 2012; Ayers et al., 2014; Boorman et al., 2014; O'Donovan et al., 2014; Verreault et al., 2012). However, it is interesting that type of birth (i.e. vaginal or caesarean) was not associated with PTS whereas urinary catheterisation was. In this study, it was not uncommon for participants to have some form of obstetric intervention. Consequently, in order to be able to manage a high number of births in a birth unit where availability is very limited, some obstetric interventions might be used to expedite this process. Although urinary catheterisation is among the least used obstetric interventions during labour, it is very interesting that it was associated with PTS following childbirth. In fact, urinary catheterisation is used to drain urine when labour contractions start but women are reluctant to go to the lavatory. Since the foetus stretches the perineum, it is not considered a detrimental method for women's physiological health. However, draining urine with a medical intervention might make the women feel out of control and embarrassed, which in turn might increase the risk for the development of PTS after childbirth. Indeed, feeling out of control has been significantly associated with PTS following childbirth in other studies (Soet, Brack, & Dilorio, 2003; Wijma, Söderquist, & Wijma, 1997).

The postnatal variables most strongly associated with PTS following childbirth in this study were poor psychological adaptation to motherhood and increased fear of birth.

Successful adaptation of a woman to motherhood is influenced not only by her own health and that of family members, but also by the baby's health (Kiehl, Carson, & Dykes, 2007). Social support also affects maternal adaptation (Emmanuel et al., 2008). Contrary to previous findings, social support did not show any significant association with PTS in the present sample. Whereas Verreault et al. (2012) noted social support as the most important predictor for PTS after birth, Vossbeck-Elsebusch, Freisfeld and Ehring (2014) did not find any significant relationship between social support and birth-related PTS. The difference between these results may be explained by the recruitment of participants in different postnatal time periods. It has been suggested that the effect of social support on birth-related PTS may not be observed within the first three weeks after birth, but may account for more variance in PTS three months after birth (Ford, Ayers, & Bradley, 2010). Alternatively, the role of social support for PTS after birth may also be moderated by cultural factors. In Nigde most women live in extended families and in the Turkish culture postpartum women are given significant support for 40 days after birth by their family and friends. This support could have increased adaptation to motherhood. An intense fear of birth has been found to be a strong predictor of birth-related PTS (Ayers, 2014; Garthus-Niegel et al., 2014; Salomonsson et al., 2013; Söderquist, Wijma, Wijma, 2002). In the present study, a significant relationship was found between increased fear of birth postpartum and PTS following childbirth; this association was not found when fear of birth was assessed prenatally. The results of this study therefore supported the hypothesis that if women have a traumatic birth, they are more likely to be frightened of birth subsequently.

The final model of key prenatal, birth and postnatal risk factors explained 29% of the variance in PTS following childbirth. In this study, we aimed to examine the factors associated with PTS following childbirth and selected a few potential protective or risk factors based on previous literature and potential cultural relevance. However, it was not possible to

include all risk and protective factors and it is possible that adding more could increase the variance explained. Possible variables identified as important by meta-analyses that were not included in our study include depression in pregnancy and a history of psychological problems (Grekin & O'Hara, 2014). Future research should examine whether including these variables adds to explanatory power of models of risk factors for PTS following childbirth.

Finally, the mean level of PTS in this sample and the proportion of women reporting severe symptoms was much higher than that found in studies conducted in other countries that have used similar symptom measures (Garthus-Niegel et al., 2013; Modarres et al., 2012; Grekin & O'Hara, 2014). This increased rate of severe symptoms may be due to the cultural context or healthcare system of Turkey although the measure used in this (and other) studies relies on self-report and does not measure the full diagnostic criteria for PTSD. Studies of prevalence using diagnostic interviews are therefore needed to examine this further and establish the public health burden of postpartum PTSD in Turkey.

Limitations

This research is the first study of PTS following childbirth in women in Turkey. However, it has some limitations, including sample characteristics and time of data collection. Firstly, the study was conducted in healthcare centres in the province centre of Nigde which is a particular social and healthcare context. It is therefore not clear if these results are generalizable to other regions or countries. There are only two state maternity hospitals providing maternity services in this area, and most of the pregnant women living in Nigde generally prefer to be examined at these hospitals. The majority of the women who live in surrounding rural areas obtain antenatal care only from the health care centres located close to them due to the transportation and socio-economic difficulties. This situation might play a role in experiencing PTS following childbirth because women who live in rural areas will only meet hospital staff and the birth attendants for the first time when they come to hospital

in labour. This may increase stress for these women and potentially make them more likely to develop PTS following childbirth. Secondly, women were excluded if they were less than 20 weeks gestation and had pregnancy-related complications or a previous caesarean section. This was to address the aim of this study to determine the risk of PTS and associated factors in women with a normal pregnancy. However, this means that women at greater risk of PTS may have been excluded so this study cannot provide a measure of prevalence in the general population. Thirdly, the measure used in this study (the Impact of Event Scale) measures PTS and not full diagnostic criteria for PTSD. This also means we cannot determine the prevalence of diagnostic cases of PTSD following childbirth. Thirdly, the sample in this study consisted of participants from a city in Central Anotolia, Nigde, Turkey. The prenatal and postnatal periods are times of great change that are largely affected by cultural values and beliefs. Turkey has seven main geographical regions, and each region has different cultural values, so it is important that research is conducted in the different regions. Therefore, the results found in this study should only be used to inform practice in this province. Finally, women completed questionnaires in interviews in their home or health centre. Although interviews were conducted by students not connected with their maternity care it is possible that the setting in which interviews were conducted affected women's responses. This needs to be examined in future research.

Conclusions and implications

The results of this study make an important contribution to the literature in that it is the first study assessing factors associated with birth-related PTS in women in Turkey. This study suggests that childbirth self-efficacy in pregnancy may be important in the development of PTS following childbirth. Offering antenatal educational classes to increase childbirth self-efficacy in the early prenatal period may help women develop realistic expectations about

birth and enhance their childbirth self-efficacy. However, this is conjecture at this stage and further research is needed to substantiate this.

The process of birth and women's perception of the childbirth experience may also affect the occurrence of PTS following childbirth. In the present study, urinary catheterization was strongly associated with PTS. In that sense, nurses and midwives should help women to feel a greater sense of control in collaboration with the doctors by encouraging them to be involved in the decisions about labour so that the women's psychological and physical wellbeing is supported. Finally, this study showed that women with PTS following childbirth are more likely to report poor psychological adaptation after birth and increased fear of birth. In this respect, postpartum support and intervention could ameliorate the impact of a traumatic birth on women's adaptation and future pregnancies. Similarly, support for women with severe PTS following birth could be important to help these women adapt more successfully. Nurses and midwifes should be educated to recognise those women with PTS and refer them to relevant services where available.

References

Alcorn, K. L., O'Donovan, A., Patrick, J. C., Creedy, D., & Devilly G. J., 2010. A prospective longitudinal study of the prevalence of post-traumatic stress disorder resulting from childbirth events. Psychological Medicine 40(11), **1**849-1859.

American Psychiatric Association (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., Text Revision). Washington, DC: American Psychiatric Publishing.

Andersen, L.B., Melvaer, L.B., Videbech, P., Lamont, R.F., & Joergensen, J.S., 2012. Risk factors for developing post-traumatic stress disoreder following childbirth: a systematic review. Acta Obstetricia et Gynecologica Scandinavica 91, 1261-1272.

Ayers, S., 2014. Fear of childbirth, postnatal post-traumatic stress disorder and midwifery care. Midwifery 30, 145-148.

Ayers, S., Bond, R., Bertullies, S., & Wijma, K. (2016). The aetiology of post-traumatic stress following childbirth: a meta-analysis and theoretical framework. Psychological Medicine, 46(6), 1121-34.

Ayers, S., Eagle, A. & Waring, H., 2006. The effects of childbirth –related postraumatic stress disorder on women and their relationships: a qualitative study. Psychology, Health and Medicine 11(4), 389-398.

Ayers, S., Jessop, D., Pike, A., Parfitt, Y., Ford, E., 2014. The role of adult attachment style, birth intervention and support in posttraumatic stress after childbirth: A prospective study. Journal of Affective Disorders 155, 295-298.

Ayers, S., Joseph, S., McKenzie-McHard, K., Slade, P. & Wijma, K., 2008. Post-traumatic stres disorder following childbirth: current issues and recommendations for future research. Journal of Psychosomatics Obstetrics & Gynecology 29 (4), 240-250.

Bandura, A., 1994. Self-efficacy. In V. S. Ramachaudran (Ed.), Encyclopedia of human behavior (Vol. 4, pp. 71-81). New York: Academic Press. (Reprinted in H. Friedman [Ed.], Encyclopedia of mental health. San Diego: Academic Press, 1998).

Beydağ, K.D., & Mete, S., 2007. Postpartum kendini değerlendirme ölçeğinin geçerlik ve güvenirlik çalışması. Atatürk Üniversitesi Hemşirelik Yüksekokulu Dergisi 10(2), 20-29.

Beydağ, K.D., & Mete, S., 2008. Prenatal kendini değerlendirme ölçeğinin geçerlik ve güvenirlik çalışması. Atatürk Üniversitesi Hemşirelik Yüksekokulu Dergisi, 11(1),16-24.

Boorman, R.J., Devilly, G.J., Gamble, J., Creedy, D.K., & Fenwick J., 2014. Childbirth and criteria for traumatic events. Midwifery 30, 255-261.

Brewin, R., Dalgleish, T., & Joseph, S., 1996. A dual representation theory of posttraumatic stress disorder. Psychological Review 103(4), 670-686.

Çorapçıoğlu, A., Yargıç, I., Geyran, P., & Kocabaşoğlu, N., 2006. Olayların etkisi ölçeği (IES-R) Türkçe versiyonunun geçerlik ve güvenirliği. New Symposium Journal 44 (1), 14-22.

Ejaz, I., 2014. Knowledge Summary 31: Maternal mental health: Why it matters and what countries with limited resources can do. Other. Partnership for Maternal, Newborn and Child Health, downloaded from: http://researchonline.lshtm.ac.uk/1932493/

Eker, D., Arkar, H., & Yaldız, H., 2001. Çok boyutlu algılanan sosyal destek ölçeği'nin gözden geçirilmiş formunun faktör yapısı, geçerlik ve güvenirliği. Türk Psikiyatri Dergisi 12(1),17-25.

Elmir, R., Virginia, S., Lesley, W., & Jackson, D., 2010.Women's percetions and experiences of a traumatic birth: a metaethnography. Journal of Advanced Nursing 66(10), 2142-2153.

Emmanuel, E., Creedy, D.K., St John, W., Gamble, J., & Brown, C., 2008. Maternal role development following childbirth among Australian women. Journal of Advanced Nursing 64, 18–26.

Ersoy, Y., 2011. Doğum Eyleminde Öz-Yeterlilik Ölçeği'nin Geçerlik ve Güvenirlik Çalışması. Akdeniz Üniversitesi Sağlık Bilimleri Enstitüsü Yüksek Lisans Tezi.

Fisher, J., Cabral de Mello, M., Patel, V., Rahman, A., Tran, T., Holton, S. & Holmes, W. 2012. Prevalence and determinants of common perinatal mental disorders in women in low- and lower-middle-income countries: a systematic review. Bulletin of the World Health Organization 90, 139-149H

Ford, E., & Ayers, S., 2009. Stressful events and support during birth: The effect on anxiety, mood and perceived control. Journal of Anxiety Disorders 23, 260-268.

Ford, E. Ayers, S., & Bradley, R., 2010. Exploration of a cognitive model to predict post-traumatic stress symptoms following childbirth. Journal of Anxiety Disorder 24, 353-359.

Ford, E., Ayers, S., & Wright, D.B., 2009. Measurement of maternalperceptions of supportandcontrol in birth (SCIB). Journal of Womens Health (Larchmt) 18(2), 245-52.

Gamble, J. & Creedy, D.K., 2009. A counselling model for postpartum women after distressing birth experiences. Midwifery 25, 21-30.

Garthus-Niegel, S., von Soest, T., Vollrath, M.E.,& Eberhard-Gran, M., 2013. The impact of subjective birth experiences on post-traumatic stress symptoms: a longitudinal study. Archives of Women's Mental Health 16(1), 1-10.

Garthus-Niegel, S., vonSoest, T., Knoph, C., Simenosen, T.B., Torgersen, L., Eberhard-Gran, M., 2014. The influence of women's preferences and actual mode of delivery on post-traumatic stress symptoms following childbirth: a population-based, longitudinal study. BMC Pregnancy and Childbirth. 14, 191.

Goldbord, J.G., 2009. Women's lived experience of their unexpected birthing process. The American Journal of Maternal/Child Nursing 34(1), 57-62.

Grekin, R. & O'Hara, M.W., 2014. Prevalence and risk factors of postpartum posttraumatic stress disorder: A meta-analsis. Clinical Psychology Review 34, 389-401.

Hodnett, E.D., Gates, S., Hofmeyr, G.J., & Sakala, C., 2012. Continuous support for women during childbirth (Review). Cochrane Database Systematic Review 17, 10, CD003766. doi: 10.1002/14651858.CD003766.pub4.

Hoge, C.W., Yehuda, R., Castro, C.A., McFarlane, A.C., Vermetten, E., Jetly, R., Koenen, K.C., Greenberg, N., Shalev, A.Y., Rauch, S.A.M., Marmar, C.R., & Rothbaum, B.O. (2016). Unintended consequences of changing the definition of posttraumatic stress disorder in DSM-5. JAMA Psychiatry, epub ahead of print. doi: 10.1001/jamapsychiatry.2016.0647

Horowitz, M., Wilner, N., & Alvarez, W., 1979. Impact of event scale: a measure of subjective stress. Psychosomatic Medicine 41(3), 209-18.

Iles, J.,Slade, P., & Spiby, H., 2011. Posttraumatic stress symptoms and postpartum depression in couples after childbirth: The role of partner support and attachment. Journal of Anxiety Disorders 25, 520-530.

Ip, W.Y., Tang, C.S.K., & Goggins, W.B., 2008. the chinese childbirth self-efficacy inventory: the development of a short form. Journal of Clinical Nursing 17(3), 333-40.

Kiehl, E.M., Carson, D.K., & Dykes, A.K., 2007. Adaptation and resiliency in Swedish families. Scandinavian Journal of Caring Sciences 21(3), 329-37.

Korukcu, O.,Kukulu, K., Firat, M.Z., 2012. The reliability and validity of the Turkish version of the Wijma Delivery Expectancy/Experience Questionnaire (W-DEQ) with pregnant women. Journal of Psychiatry Mental Health Nursing 19(3), 193-202.

Korukcu, O., Bulut, O., Kukulu, K., 2014. Psychometric evaluation of the Wijma delivery expectancy/experience questionnaire version B. Health Care Women International 13, 1-18.

Lederman, R., & Lederman, E., 1979. Relationship of psychological factors in pregnancy to progress in labor. Nursing Research 28 (4), 94-97.

Lederman, R.P.,Weingarten, C.G., Lederman, E., 1981. Postpartum self-evaluation questionnaire: measures of maternal adaptation. Birth Defects Original Article Series 17(6), 201-231.

Lemola, S., Stadlmary, M., & Grob, A., 2007. Maternal adjustment five months after birth: the impact of the subjective experience of childbirth and emotional support from the partner. Journal of Reproductive and Infant Psychology 25(3), 190-202.

Modarres, M., Afrasiabi, S., Rahnama, P., Montazeri, A., 2012. Prevalence and risk factors of childbirth-related post-traumatic stress symptoms. BMC Pregnancy and Childbirth 12, 88.

NICE, 2007. Antenatal & postnatal mental health: clinical management and service guidance, CG45. London: National Institute for Health and Clinical Excellence.

Nicholls, K., & Ayers, S., 2007. Childbirth related posttraumatic stress disorder in couples: a qualitative study. British Journal of Health Psychology 12, 491-509.

O'Donovan, A., Alcorn, K.L., Patrick, J.C., Creedy, D.K., Dawe, S., Devilly, G.J., 2014. Predicting posttraumatic stress disorder after childbirth. Midwifery 30, 935-941.

Olde, E., Kleber, R.J., Hart, O.V., & Pop, V.J.M., 2006. Childbirth and posttraumatic stress responses: a validation study of the dutch impact of event scale – revised. European Journal of Psychological Assessment 22(4), 259-267.

Parfitt, Y.,& Ayers, S., 2009. The effect of postnatal symptoms of post-traumatic stress and depression on the couple's relationship and parent-baby bond. Journal of Reproductive and Infant Psychology 27(2), 127-142.

Reynolds, J.L., 1997. Post-traumatic stress disorder after childbirth: The phenomenon of traumatic birth. Canadian Medical Association Journal 156 (6), 831-835.

Salomonsson, B., Berterö, C., & Alehagen, S., 2013. Self-efficacy in pregnant women with severe fear of childbirth. Journal of Obstetric Gynaecology Neonatal Nursing 42(2), 191-202.

Sieber, S.,Germann, N., Barbir, A., & Ehlert, U., 2006. Emotional well-being and predictors of birth-anxity, self-efficacy, and psychosocial adaptation in healthy pregnant women. Acta Obstetricia et Gynecologica 85, 1200-1207.

Soet, J.E., Brack, G.A., & Dilorio C., 2003. Prevelance and predictors of women's experience of psychological trauma during childbirth. Birth 30(1), 36-46.

Söderquist J, Wijma K, Wijma B., 2002. Traumatic stress after childbirth: the role of obstetric variables. Journal of Psychosomatic, Obstetrics & Gynaecology 23, 31-39.

Verreault, N., Da Costa, D., Marchand, A., Ireland, K., Banack, H., Dritsa, M., & Khalife, S., 2012. PTSD following childbirth: a prospective study of incidence and risk factors in Canadian women. Journal of Psychosomatic Research 73, 257-263.

Vossbeck-Elsebusch, A.N., Freisfeld, C., & Ehring, T., 2014. Predictors of posttraumatic stress symptoms following childbirth. BMC Psychiatry 14, 200.

Wijma, K., Söderquist, J., & Wijma, B., 1997. Posttraumatic stress disorder after childbirth: a cross sectional study. Journal of Anxiety Disorder 11(6), 587-97.

Wijma, K.,Wijma, B. & Zar, M., 1998. Psychosomatic aspects of W-DEQ: A new questionnaire for measurement of fear of childbirth. Journal of Psychosomatic Obstetric & Gynaecology 19(4), 84-97.

Zimet, G.D., Dahlem, N.W., Zimet, S.G. & Farley, G.K., 1988. The multidimensional scale of perceived social support. Journal of Personality Assessment 52, 30-41.

Table 1 Sociodemographic and obstretric characteristics of the participants (N=242)

Characteristics		n (%)
Educational Level	Literate	7(2.9)
	Primary school	129(53.3)
	High school	62(25.6)
	University	44(18.2)
Age (mean (SD))	Range 18-40	26.7±5.1
Parity§	1	96(39.7)
	2	63(26.0)
	3	53(21.9)
	4	20(8.3)
	5 +	10(4.1)
Previous abortion	Yes	199 (82.2)
Intrauterin fetal death	Yes	8(3.3)
Planned pregnancy§	Yes	215(88.8)
Type of birth	Vaginal	159(65.7)
	Ceserean	83(34.3)
Artificial rupture of membrane‡	Yes	84(52.8)
Enema‡	Yes	34(21.4)
Continously nonstress test ‡	Yes	151(95.0)
Painful vaginal examination ‡	Yes	156(98.1)
Urine chateterization §, ‡	Yes	42(26.4)
Oxytocin induction ‡	Yes	100(62.9)
Epidural anesthesia ‡	Yes	1(0.6)
Inhalation anesthesia? †	Yes	83(100)
Complications related to childbirth	Yes	12(5.0)
Complications related to newborn	Yes	19(7.9)
Satisfaction with the hospital§	Yes	175(72.3)
Satisfaction with doctor/midwife	Yes	192(79.3)

§, Sociodemographic and obstretric characteristics significantly related to PTSD symptoms following childbirth.
†, Women who have ceserean birth (n=83)
‡,Women who have vaginal birth (n=159)

Table 2. Correlations between study variables

	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*
1.PTS symptoms after childbirth															
2.Parity	0.13†														
3.Planned pregnancy	0.17†	0.42‡													
4.Psychological adaptation in pregnancy	0.20‡	0.23‡	0.28‡												
5.Outcome expectancy	0.14†	-0.07	0.00	-0.35‡											
6.Efficacy expectancy	-0.11†	0.01	-0.05	0.27‡	-0.21‡										
7.Fear of birth in pregnancy	0.10	0.05	0.03	0.51‡	-0.29‡	0.26‡									
8.Urinary catheterization	0.18†	-0.09	-0.08	-0.12	0.09	0.03	-0.09								
9.Satisfaction with hospital care	-0.13†	0.08	0.08	-0.11	0.07	0.01	-0.11	-0.05							
10.Support and control in birth	-0.22‡	0.02	-0.09	-0.17‡	0.10	-0.07	-0.29‡	-0.05	0.34‡						
11.Support in birth	-0.16†	0.01	-0.09	-0.14‡	0.09	-0.04	-0.27‡	-0.01	0.38‡	0.91‡					
12.External control in birth	-0.23†	-0.01	-0.17‡	0.01	-0.04	0.06	-0.07	-0.12	0.12	0.65‡	0.49‡				
13.Internal control in birth	-0.18†	0.06	0.04	-0.21‡	0.15†	-0.14†	-0.26	-0.30	0.20‡	0.74‡	0.47‡	0.26‡			
14.Fear of birth postpartum	0.33‡	-0.09	0.02	0.28‡	-0.09	0.12	0.42‡	-0.09	-0.36‡	-0.71‡	-0.59‡	-0.33‡	-0.73‡		
15.Psychological adaptation postpartum	0.28‡	0.13†	0.09	0.55‡	-0.33‡	0.13†	0.33‡	0.01	-0.17‡	-0.24‡	-0.16†	-0.02	-0.34‡	0.39‡	
16.Perceived social support postpartum	-0.08	-0.07	-0.64	-0.33‡	0.23‡	-0.09	-0.17‡	-0.04	0.09	0.18‡	0.17†	0.07	0.17‡	-0.17‡	-0.53‡

†p<0.05 ‡p<0.01

Table 3. Factors associated with PTS symptoms after childbirth

	Model 1	**Model 2**	**Model 3**
	B	***B***	***B***
Parity	0.05	.11	.10
Planned pregnancy	0.05	.03	.04
Psychological adaptation in pregnancy	0.20†	.19†	.09
Efficacy expectancy	-0.20†	-0.21†	-0.19†
Outcome expectancy	0.19†	0.17†	0.19†
Fear of birth in pregnancy	0.12	.00	.02
Urinary catheterization		.23‡	.21‡
Satisfaction with hospital care		-.00	.01
Support and control in birth		-0.10	-0.10
Fear of birth postpartum		0.28‡	0.22†
Psychological adaptation postpartum			.24†
Perceived social support			.08
R^2	0.11	0.26	0.29
F	3.14	5.23	4.91
p	.006	.000	.000

†p<0.05 ‡p<0.01