The relationship between childbirth self-efficacy and aspects of well-being, birth interventions and birth outcomes

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ABSTRACT

Objective: this study aimed to examine how women's childbirth self-efficacy beliefs relate to aspects of well-being during the third trimester of pregnancy and whether there was any association between childbirth self-efficacy and obstetric factors.
Design: a cross-sectional design was used. The data was obtained through the distribution of a composite questionnaire and antenatal and birth records.
Setting: data were recruited from antenatal health-care clinics in Halland, Sweden.
Participants: a consecutive sample of 406 pregnant women was recruited at the end of pregnancy at gestational weeks of 35–42.
Measurements: five different measures were used; the Swedish version of Childbirth Self-Efficacy Inventory, the Wijma Delivery Expectancy/Experience Questionnaire, the Sense of Coherence Questionnaire, the Maternity Social Support Scale and finally the Profile of Mood States.
Findings: results showed that childbirth self-efficacy was correlated with positive dimensions as vigour, sense of coherence and maternal support and negatively correlated with previous mental illness, negative mood states and fear of childbirth. Women who reported high childbirth self-efficacy had less epidural analgesia during childbirth, compared to women with low self-efficacy.
Key conclusions: this study highlights that childbirth self-efficacy is a positive dimension that interplays with other aspects and contributes to well-being during pregnancy and thereby, acts as an asset in the context of childbirth.

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Introduction

Being pregnant and becoming a mother is a transition and an adaption that poses a challenge for the woman (Barclay et al., 1997; Nelson, 2003). The transition is a passage of change and this also includes a redevelopment of self-agency (Kralik et al., 2006). Self-efficacy is a construct that is considered to have a major impact on human agency as it refers to beliefs in one's agentive capability (Bandura, 1995; Bandura, 1997; Bandura, 2001). This construct is composed of two cognitive assessments. First, when an individual encounters a new situation the individual evaluates what specific skill and behaviour will be best to perform in this particular situation (i.e. outcome expectancy). Secondly, the individual evaluates her own ability to act and master the skills required (i.e. efficacy expectancy) (Bandura, 1997). It is the individual's beliefs that are the most important for the evaluation, not what is actually true or not. Depending on how the individuals perceive their capabilities in the situation that lies ahead, self-efficacy will affect motivation, vulnerability to emotional distress and last but not the least, influence the behaviour that will be initiated in the given situation (Bandura, 1997). For a woman who is expecting her first child the impending labour is a situation she has never faced and she is thus, without personal previous experiences. This may cause doubts about own capability to cope with labour and birth and thus, stress responses. Those who believe themselves to possess adequate abilities to cope with labour will feel more in control and have a reduced stress response (Bandura et al., 1977; Bandura, 1982; Nierop et al., 2008). Further, women's self-efficacy during pregnancy also affects well-being during pregnancy with respect to mood (Nierop et al., 2008), anxiety (Sieber et al., 2006; Beebe et al., 2007) and fear of childbirth (Lowe, 2000; Salomonsson et al., 2013b). Fear of

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childbirth has also been associated with anxiety and depression (Storksen et al., 2012). In Sweden self-reported symptoms of mental illness especially anxiety and depression are increasing among young people (Socialstyrelsen, 2013). Thus, we may assume that among childbearing women we have a group of considerable sizes that have an increased vulnerability during the transition to motherhood and may have more difficulties in coping with childbirth. This group with previous mental illness poses a challenge for the antenatal and obstetric care with more pregnancy complications (Kurki et al., 2000) and an increased number of obstetric visits (Andersson et al., 2004). Furthermore, these women also have a higher number of instrumental deliveries and caesarian sections (Chung et al., 2001; Thornton et al., 2010).

Childbirth self-efficacy has received attention in several countries such as USA (Lowe, 2000; Beebe et al., 2007), Iran (Taheri et al., 2014), Hong Kong (Ip et al., 2009), New Zealand (Berentson-Shaw et al., 2009) and Germany (Sieber et al., 2006) but studies from the Nordic countries in the area of childbirth self-efficacy are scarce. There are only two published studies by Salomonsson et al. (2013a, 2013b) who had solely studied the self-efficacy concept in relation to fear of childbirth and interventions during labour and birth outcomes. To our knowledge, no other studies have focused on both positive and negative dimensions of well-being in relation to childbirth self-efficacy and interventions during birth and birth outcome.

The aim of the present study was twofold. First, we wanted to study how women's childbirth self-efficacy beliefs relate to aspects of wellbeing during the third trimester of pregnancy. The second aim was to assess whether there was any association between childbirth self-efficacy and obstetric factors.

Methods

Study design and setting

This study used a cross-sectional survey design and women were recruited by their own midwife during a clinical appointment at the antenatal clinics in Halland, Sweden, during a period in 2011–2012.

Participants

A prospective consecutive sample of 406 pregnant women was recruited at the end of pregnancy at gestational weeks of 35–42. Third trimester was chosen because self-efficacy is a condition that is changeable. The inclusions criteria for participating were the following: Only nulliparous women were invited to participate, to avoid influence of a previous birth experience on their level of childbirth self-efficacy. Further, only singleton and normal pregnancies were included. An additional criterion for participation was that the women had the ability to understand the Swedish language sufficiently well to read and fill in the questionnaires. Ninety-five per cent of the women, who were accessible consented to participate and completed a questionnaire during a routine visit.

Data collection and data sources

Data were collected by a composite questionnaire which included background questions regarding age, education level, cohabitating status, employment status and place of birth. We added questions about sources that could affect childbirth self-efficacy such as attendance in childbirth education classes and if the women had spoken about their upcoming birth and/or if they had heard birth stories from others (family/other relatives and friends). Moreover, one additional question was about previous mental health illness, phrased as 'Have you ever sought professional health service for mental illness'? Additional data on previous reproductive history and mental diagnosis, and lifestyle factors such as tobacco use, and body mass index (BMI) was collected from the antenatal birth records as well as obstetrical data from the birth records retrospect. The composite questionnaire was combined with five self-assessment scales.

Measurements

Childbirth Self-Efficacy Inventory (CBSEI)

The Swedish version of Childbirth Self-Efficacy Inventory (Swe-CBSEI) was used to assess self-efficacy prior to the impending childbirth (Carlsson et al., 2014). This Inventory was translated from Lowe's (1993) original Inventory. The inventory is a four dimensional instrument designed to measure outcome expectancies and self-efficacy expectancies during both the first active stage of labour and second stage of labour.

In this study we choose only to use the dimension of the scale measuring self-efficacy expectancies for the first active stage of labour (Efficacy active labour, E-AL). The dimension used (E-AL) is a 15-item scale, ranging from 1 to 10; higher scores indicate a higher degree of childbirth self-efficacy and maximum scores are set to 150.

The original inventory has been translated and has shown reliability and validity in several cultures (Drummond and Rickwood, 1997; Ip et al., 2005; Khorsandi et al., 2008; Tanglakmankhong et al., 2011). The Swedish version is validated within the Swedish culture with satisfactory psychometric properties (Carlsson et al., 2014).The reference value for Cronbach's alpha coefficients was 0.93 in Lowe's (1993) original study and 0.92 in the present study.

The Wijma Delivery Expectancy/Experience Questionnaire (W-DEQ)

The Wijma Delivery Expectancy/Experience Questionnaire (W-DEQ) was developed and tested for psychometric properties in Sweden by Wijma et al. (1998). It measures fear specific to childbirth and delivery. The scale consists of 33 items, with items ranging from 0 (extremely) to 5 (not at all). The maximum score is 165 and a minimum score is zero. The cut-off point beyond ≥ 85 is suggested to indicate a more severe fear of childbirth known as SFOC (Ryding et al., 1998) and a score of ≥ 100 has been used in previous studies to represent phobic fear of childbirth. The instrument has been used extensively and has been translated and tested in several countries (Hall et al., 2009; Nordeng et al., 2012). The instrument has demonstrated high internal consistency ($\alpha=0.89$) and high validity (Wijma et al., 1998). In the present study Cronbach's alpha coefficient was 0.92.

Sense of Coherence Questionnaire (SOC-13)

The SOC scale developed by Antonovsky (1987) measures overall sense of coherence, a global life orientation which acts as a resource to manage stressful situations (Eriksson and Lindström, 2006). The short version consists of 13 items with response rating from 1 (very often) to 7 (very seldom or never), with a total maximum sum of 91. The higher the scores the more the sense of coherence. The SOC scale has been used in various contexts associated to pregnancy and childbirth (Jeschke et al., 2012; Tham et al., 2007; Sjoström et al., 2004).The tool has demonstrated validity and internal consistency ($\alpha= > 0.80$) (Sjoström et al., 2004) and for the present sample the Cronbach's alpha coefficient was ($\alpha=0.85$).

Maternity Social Support Scale (MSSS)

This scale is a self-report questionnaire designed to measure perceptions of availability of social support during pregnancy (Webster et al., 2000). This scale is a short scale including six questions with statements about support from family, friends and from the partner. The self-reported items range from 1 (strongly agree) to 5 (strongly disagree), the total maximum score sum for the scale is 30, with higher scores indicating higher perceived support. The cut-off points recommended are 0–18 low support, 19–24 medium support, and 24 and more as adequate support (Webster et al., 2000). The scale was translated to the Swedish language by Wahn and Nissen (2008), and included in a study with teenage mothers. Internal consistency in this study was satisfactory ($\alpha=0.87$). For the current sample the scale was indicating a lower level of internal consistency measured by Cronbach´s alpha ($\alpha=0.59$) than in the previous study by Wahn and Nissen (2008).

Profile of Mood States (POMS)

Self-reported levels of mood were assessed with the Profile of Mood States (Mcnair, 1971). This instrument measures six dimensions of mood states with a 65 adjective item checklist. Five of the dimensions are negative mood states; tension–anxiety, depression–detection, anger–hostility, fatigue–inertia, confusion–bewilderment and one single subscale measuring the positive dimension of vigour or functional efficacy. The POMS is a five-point scale with items ranging from 0 (not at all) to 4 (very often); higher scores represent a better mood. It is possible to calculate a total score of mood state (POMS total), with a minimum score at 0 and a maximum score set to 260. However, in this study we choose to analyse and present each subscale separately to be able to show the various dimensions of mood. The instrument has been used in accordance with pregnancy and childbirth research for example to investigate exercise and psychological well-being during pregnancy (Gaston and Prapavessis, 2013) and to measure parental attitudes in motherhood (Grussu et al., 2005). The POMS is known to have good psychometric properties, with good internal consistency for all subscales and for POMS total (Mcnair, 1971). Internal consistency from the current sample was also highly satisfactory with Cronbach's alpha ranging between 0.74 and 0.88 for the six subscales. Lowest score was measured for fatigue–inertia and highest scores for anger–hostility.

Data analysis

All statistical analyses were conducted using IBM SPSS version 20.0 for windows. Descriptive statistics were performed for describing the participant's characteristics and for describing the findings from the five scales used in this study. In order to analyse differences between women with low respectively high self-efficacy, we divided the respondents into groups from the median (md 95) and quartiles. The first quartile (≤ 79) made up the low self-efficacy expectancy group of women, the second made up a median group (80–112), and the third quartile (≥ 113) made up the high self-efficacy expectancy group. The median group was excluded from the analysis.

Statistical analysis was performed by means of Student' t-test for independent samples for continuous variables; normally distributed data and categorical variables were analysed with the χ^2 test or Fisher's exact test. We analysed the associations between childbirth self-efficacy inventory with the four scales, WEDQ, SOC, MSSS and POMS using Spearman's correlation coefficient (r_s) (due to skewed data). Finally, a logistic regression analysis was assessed to establish a predictive theoretical model of the childbirth self-efficacy with childbirth self-efficacy as a dependent variable. The model contained sum scores of the continuous variables: WEDQ, SOC, MSSS and the following subscales of POMS: vigour, fatigue,

Table 1
Background characteristics of the participating women in accordance to low and high childbirth self-efficacy.

Variable	All women n=406	Low childbirth self-efficacy n=106 (24.4%)	High childbirth self-efficacy n=96 (22.3%)	p-Value
Age (mean, $\pm$ SD)	28.3 $\pm$ 4.8	28.02 $\pm$ 4.57	28.67 $\pm$ 4.66	0.321(t)
Min–max	17–44	17–39	20–44	
Country of birth				
Sweden	367	97 (53.0)	86 (47.0)	
Other country	39	8 (44.4)	10 (55.6)	0.655
Cohabitating				
Living with partner	200	101 (52.6)	91 (47.4)	1.000
Highest education level				
Elementary school	404	105 (52.2)	96 (47.8)	0.992
High school	393	100 (51.3)	95 (48.7)	
University	191	47 (51.6	44 (48.4)	
Occupational condition				
Employed/student	326	82 (50.9)	79 (49.1)	0.570
Unemployed/sick leave	74	22 (57.9)	16 (42.1)	
Reproductive background				
History of infertility ≥ 1 year	72	19 (52.8)	17 (47.2)	1.000
Assisted reproductive technology	38	10 (50.0)	10 (50)	1.000
Previous miscarriage	77	23 (57.5)	17 (42.5)	0.570
Lifestyle factors				
Tobacco use before pregnancy and during pregnancy	70(17.2)	17 (53.1)	15 (46.9)	1.000
Body mass index (mean, $\pm$ SD)	24.08 $\pm$ 4.2	24.57 $\pm$ 5.5	24.11 $\pm$ 3.9	0.503(t)
Previously sought professional mental health service/diagnosis of mental illness, n (%)	98	33 (68.8)	15 (31.2)	**0.016***

Comparison at 1st and 3rd quartiles for childbirth self-efficacy. Differences between groups were tested by t-test for continuous variables (t) and χ^2 test for categorical variables.
Value is significant at *$p < 0.05$.

confusion, tension, depression and anger. The two categorical variables, previous mental illness and birth stories from the sisters of the participants were dichotomized. All tests were two sided. The significant level was set at $p < 0.05$. Missing items were not replaced with any other value; instead we choose to exclude pairwise cases.

Ethical approval

Permission to access the study population was gained from the directors of the antenatal care units and ethical approval was attained from the Research Ethics Committee in Lund (no 2009/19).

Findings

Sample descriptions

This study sample included 406 women with a mean age of 28.3 years (SD 4.8), ranging from ages 17–44 years. In total 90.4% were born in Sweden and 95.6% cohabited with their partner. A majority of the participating women (96.8%) had a formal upper secondary education and 47% had studied at college or university level. Infertility prior to pregnancy was reported in 17.7% and 9.2% of these had been treated for infertility. About 24% had previously sought professional help for mental illness and the most common previous diagnosis was depression (4.7%) (Table 1)

Childbirth self-efficacy related to aspects of well-being during pregnancy

Correlations between the five scales: Swe-CBSEI, W-EDQ, SOC, POMS and MSSS included in the present study are summarised in Table 2.

The relationship between perceived childbirth self-efficacy measured by the Swedish version of the childbirth self-efficacy inventory and the four scales, W-EDQ, SOC, POMS and MSSS, was compared using Spearman correlation coefficient. All four scales included in the study were correlated with childbirth self-efficacy. As shown in Table 2, the strongest relationship with childbirth self-efficacy was the Wijmas Delivery Expectancy/experience Questionnaire, measuring fear of childbirth ($r_s = -.590$, $p = < 0.001$, $n = 366$). Those with lower childbirth self-efficacy reported more fear of childbirth, than those with high childbirth self-efficacy. Moreover, the POMS subscales measuring the negative dimensions of mood were also weakly negatively but significantly correlated to the Swe-CBSEI; tension ($r_s = -0.296$, $p = < 0.001$, $n = 393$); fatigue ($r_s = 0.298$, $p = < 0.001$, $n = 393$); (confusion ($r_s = -0.230$, $p = < 0.001$, $n = 393$); depression ($r_s = 0.243$ $p = < 0.001$, $n = 392$) and anger ($r_s = 0.180$, $p = < 0.001$, $n = 391$).

Finally, the results also indicated that the higher the women rated their childbirth self-efficacy the higher they scored on positive dimensions of well-being. Those with high childbirth self-efficacy also showed more sense of coherence ($r_s = 0.306$, $p = < 0.001$, $n = 392$) and more vigour measured with the POMS subscale ($r_s = 0.294$, $p < 0.001$, $n = 391$). The weakest correlation was observed between Swe-CBSEI and how the women perceived available social support during pregnancy ($r_s = 0.227$, $p = < 0.001$, $n = 390$).

Childbirth self-efficacy related to socio-demographic and other background characteristics and sources of self-efficacy during pregnancy

In the next step the results of the Swe-CBSEI were divided into a low and high self-efficacy group according to quarters (1st and 3rd quarter) and the comparisons were made between these groups. We found that those who scored high on the Swe-CBSEI reported significantly less frequency of previous mental illness ($p = 0.016$). Further, women who scored lower on the Swe-CBSEI had more often sought professional help or had a diagnosis of previous mental illness compared to women who estimated a higher childbirth self-efficacy. There was no other significant difference in socio-demographic and other background variables between those scoring low and high on the Swe-CBSEI (Table 1).

In total 90.1% of the women had prepared themselves for the impending birth by taking part of the antenatal group preparations and by talking to others (89.2%). Additional sources used for mental preparations were reading literature (78.8) and the social media (79.8). Moreover, we tried to capture two sources that may affect self-efficacy; *vicarious experience* (i.e. social comparison of others similar to oneself) with questions about birth stories and *verbal persuasion* (i.e. social persuasion to strengthening people's beliefs) with questions about antenatal preparations. It was shown that women scored significantly higher regarding childbirth self-efficacy if they had been told birth stories from their own sisters than if they had not heard stories from unspecified sources ($p = 0.034$). No other differences were found between the two groups in relation to birth preparations (Table 3).

Childbirth self-efficacy and obstetric aspects

There were no significant differences between the group of women who scored low on Swe-CBSEI (1st Q) and the group who scored high (3rd Q) in any of the obstetric variables studied at admission to the labour ward such as duration from labour onset until hospital admission, cervix dilatation at admission or admission in non-established labour or not (Table 4).Significant group differences were only found in the use of epidural analgesia as pain relief. Women who estimated their childbirth self-efficacy as low used more epidural analgesia compared to women with high childbirth self-efficacy ($p = 0.012$). This was the only intervention where the groups differed significantly. No differences were found in the mode of delivery and birth outcomes, such as duration of labour, hemorrage, infant Apgar score or length of hospital stay.

Finally, a logistic regression analysis was performed to assess the impact of a number of factors on the likelihood that respondents would report high or low childbirth-self-efficacy (low self-efficacy=0/high self-efficacy=1). The analysis contained 11 independent variables: Scores on WEDQ, SOC, MSSS and the following subscales of POMS; vigour, fatigue, confusion, tension, depression and anger and previous mental illness (0/1) and 'heard birth stories from the sisters of the participants' (0/1). Firstly, the findings from Hosmer and Lemeshow Test were $p = 0.258$, showing that the model was appropriate. The findings from the Swe-CBSEI indicated that five of the independent variables were statistically significant (Table 5). The findings revealed a significantly increased risk for rating a low childbirth self-efficacy if the woman scored high on fear of childbirth as measured by W-EDQ (OR 0.89, CI 0.86–0.89) and if she had had previous mental illness (OR 0.22, CI 0.07–0.72). Furthermore, the opposite findings showed that it was more common that women rated high childbirth self-efficacy if they also rated high levels on the POMS' subscale vigour (OR 1.09, CI 1.00–1.19); POMS' anger (OR 1.13, CI 1.01–1.17) and finally, if the woman had heard her sister's birth story (OR 3.03, CI 1.14–8.01).

Table 2
Correlations (Spearmans Rho) between the Swedish version of the Childbirth Self-Efficacy Inventory and the other scales included in the study. Descriptive statistics and Cronbachs alpha of the scales ($n=406$).

	Swe-CBSEI	WEDQ	SOC	MSS	POMS/ Vigour	POMS/ Fatigue	POMS/ Confusion	POMS/ Tension	POMS/ Depression	POMS/ Anger
Swe-CBSEI	–									
WEDQ	**−0.590**[**]	–								
	$n=366$									
SOC	**0.306**[**]	**−0.468**[**]	–							
	$n=392$	$n=375$								
MSS	0.227[**]	**−0.340**[**]	**0.436**[**]	–						
	$n=390$	$n=376$	$n=402$							
POMS/Vigour	0.294[**]	−0.247[**]	0.238[**]	0.198[**]	–					
	$n=391$	$n=374$	$n=402$	$n=401$						
POMS/Fatigue	−0.298[**]	**0.340**[**]	**−0.469**[**]	−0.265[**]	**−0.426**[**]					
	$n=393$	$n=376$	$n=404$	$n=403$	$n=404$	–				
POMS/Confusion	−0.230[**]	0.289[**]	**−0.454**[**]	−0.237[**]	−0.266[**]	**0.605**[**]	–			
	$n=393$	$n=390$	$n=404$	$n=403$	$n=404$	$n=406$				
POMS/Tension	−0.206[**]	**0.354**[**]	**−0.472**[**]	−0.285[**]	−0.244[**]	**0.571**[**]	**0.524**[**]	–		
	$n=393$	$n=376$	$n=404$	$n=403$	$n=403$	$n=406$	$n=406$			
POMS/ Depression	−0.243[**]	**0.380**[**]	**−0.517**[**]	−0.387[**]	−0.297[**]	**0.518**[**]	**0.471**[**]	**0.653**[**]	–	
	$n=392$	$n=376$	$n=403$	$n=402$	$n=403$	$n=405$	$n=405$	$n=405$		
POMS/Anger	−0.180[**]	**0.314**[**]	**−0.519**[**]	**−0.364**[**]	−0.198[**]	**0.522**[**]	**0.479**[**]	**0.556**[**]	**0.624**[**]	–
	$n=391$	$n=375$	$n=402$	$n=401$	$n=403$	$n=404$	$n=404$	$n=404$	$n=404$	
M/SD	95.05/ 23.37	90.65/ 20.92	66.57/ 10.82	27.98/ 2.39	13.88/5.48	7.88/5.09	8.18/4.34	9.46/5.14	4.98/6.12	6.40/6.12
Cronbach's α	0.92	0.92	0.85	0.59	0.79	0.82	0.74	0.79	0.87	0.88

Instruments included in the study:
(a) The Swedish version of the Childbirth Self-Efficacy Inventory (Swe−CBSEI).
(b) The Wijma Delivery Expectancy/Experience Questionnaire, version A (W−EDQ).
(c) Sense of Coherence of coherence scale, 13−item version (SOC).
(d) Maternal Social Support Scale (MSSS).
e) Profile Of Mood States subscales (POMS): vigour, fatigue, confusion, tension, depression and anger.
Values are significant at [*]$p < 0.05$; [**]$p < 0.01$. Font in bold indicates medium to large correlation (Cohen, 1988).

Table3
Characteristics of the participating women's birth preparations and sources of vicarious experiences from other persons birth stories.

Variable	All women n=406	Low childbirth self-efficacy n =106 (24.4%)	High childbirth self-efficacy n=96 (22.3%)	p-Value
Birth preparations				
Participating in antenatal group education	366	94 (52.2)	86 (89.6)	1.000
Additional parental education course	20	5 (45.5)	6 (54.5)	0.878
Information on social media	324	82 (51.9)	76 (48.1)	0.990
Reading literature	320	86 (53.1)	76 (46.9)	0.755
Films or television	181	44 (51.8)	41 (48.2)	1.000
Spoken to anyone about their upcoming birth	383	99 (51.6)	93 (48.4)	1.000
Spoken with their mothers	280	71 (49.3)	73 (50.7)	0.243
Spoken with their fathers	67	22 (53.7)	19 (46.3)	0.977
Spoken with their sisters	153	38 (48.7)	40 (51.3)	0.515
Spoken with their brothers	31	10 (47.6)	11 (52.4)	0.828
Spoken with their relatives	108	39 (60.9)	25 (39.1)	0.125
Spoken with their friends	293	75(50.3)	74 (49.7)	0.451
Spoken with their partner	364	96 (52.5)	87 (47.5)	1.000
Spoken with others on social media	42	11(47.8)	12 (52.2%)	0.819
Vicarious experiences from birth stories	393	99 (51.6)	93 (48.4)	0.753
Birth stories from their mothers	303	78 (50.0)	78 (50.0)	0.311
Birth stories from their fathers	31	5 (35.7)	9 (64.3)	0.314
Birth stories from their sisters	130	23 (39.7)	35 (60.3)	**0.034**[*]
Birth stories from their brothers	18	5 (38.5)	8(61.5)	0.459
Birth stories from their relatives	165	46 (51.7)	43 (48.3)	1.000
Birth stories from their friends	359	89 (50.3)	88 (49.7)	0.197
Birth stories from their partner	23	3 (25.0)	9 (75.0)	0.099

Comparison at 1st and 3rd quartiles for childbirth self-efficacy. Differences between groups were tested by χ^2 test for categorical variables. Values are significant at [*]$p < 0.05$.

Discussion

The focus of our study was to describe women's self-rated childbirth self-efficacy during the third trimester of pregnancy and how the construct of childbirth self-efficacy relates to other factors

concerning well-being during pregnancy and childbirth, obstetric interventions and birth outcomes. The results confirmed our hypothesis, that women reporting high levels of self-efficacy had significantly higher levels of positive aspects of well-being, in this study measured such as, vigour, sense of coherence and social

Table 4

Outcome variables of births in women according to reported childbirth self-efficacy in accordance with low and high childbirth self-efficacy.

Variable	All women n=406	Low childbirth self-efficacy n=106 (24.4%)	High childbirth self-efficacy n=96 (22.3%)	p-Value
At admission to the labour ward				
Time duration from labor onset until admittance in labour ward (mean, ± SD)	n=305 9.01 ± 12.98	n=78 10.27 ± 19.99	n=75 9.27 ± 8.62	0.690(t)
Min–max (hours)	0–176			
Cervix dilatation when admittance to labour ward (cm)	n=375 3.49 ± 2.46 0–11	n=97 3.19 ± 2.32	n= 88 3.52 ± 2.55	0.347(t)
Admittance to hospital due to contraction, in non-established labour, ($cx \leq 3$ cm), n (%)	160(39.4)	41/50%)	41(50%)	0.658
Obstetric interventions during labour				
Epidural as pain relief, n (%)	169 (41.6)	51 (63.7)	29 (36.2)	**0.012***
Narcotics as pain relief, n (%)	62 (15.3)	17 (56.7)	13 (43.3)	0.743
Amniotomy, n (%)	167 (41.1)	52 (59.1)	36 (40.9)	0.115
Episiotomy n (%)	47 (11.6)	18 (69.2)	8 (30.8)	0.105
Augmentation with oxytocin, n (%)	202 (49.8)	53 (54.2)	44 (45.8)	0.703
Sphincter tears, n (%)	16 (3.9)	3 (42.9)	4 (57.1)	0.710(f)
Mode of delivery				
Vacuum extraction and emergency CS, n (%)	89 (21.9)	27 (58.7)	19 (41.3)	0.406
Birth outcomes				
Prolonged labour,n (%)	58 (14.3)	15 (51.7)	14 (48.3)	1.000
Manual removal of placenta, n (%)	8 (2.0)	5 (100)	0 (0)	0.089
Haemorrhage > 600 ml, n (%)	64 (15.8)	17 (63.0)	10 (37.0)	0.335
Apgar score at one minute < 7, n (%)	17 (4.2)	7 (58.3)	5 (41.7)	0.905
Length of stay at labour ward	n=403 13.88 ± 17.06	n=105 14.36 ± 17.56	n=95 12.04 ± 12.39	0.278
Min–max (hours)	0–150			

Comparison at 1st and 3rd quartiles for childbirth self-efficacy. Differences between groups were tested by t-test for continuous variables (t) and χ^2 and Fischer's test (f) for categorical variables. Values are significant at *$p < 0.05$.

support. In contrast, low childbirth efficacy was related to both fear of childbirth and previous mental illness. There were no differences in birth outcomes. The only significant difference in

Table 5

Logistic regression predicting likelihood of reporting high and low childbirth self-efficacy.

n=202	Low self-efficacy n=106	High self-efficacy n=96	OR	CI	p
Previous mental illness No/yes	73/33	81/15	0.22	0.07–0.72	0.012**
Sisters birth story No/yes	83/23	61/35	3.03	1.14–8.01	0.026*
W-EDQ	88	99	0.89	0.86–0.89	0.001**
MSSS	96	104	0.96	0.74–1.25	0.756
SOC	96	105	0.98	0.93–1.04	0.521
POMS/tension	96	106	1.02	0.89–1.17	0.770
POMS/depression	96	106	0.87	0.89–1.15	0.891
POMS/anger	96	106	1.13	1.01–1.17	0.039*
POMS/vigour	96	105	1.09	1.00–1.19	0.046*
POMS/fatigue	96	106	0.95	0.84–1.07	0.359
POMS/confusion	96	106	1.02	0.89–1.16	0.766

Comparison at 1st and 3rd quartiles for childbirth self-efficacy.
Values are significant at *$p < 0.05$; **$p < 0.01$.

regard to interventions was the use of epidural analgesia during labour.

It was not surprising to find the relationship between vigour and self-efficacy as vigour represents a positive affect and feeling of high energy (Mcnair, 1971).

Likewise, sense of coherence and social support are known factors to buffer stress when dealing with stressful situations (Sjöström et al., 2004). Metaphorically speaking, self-efficacy theory has been included under the salutogenic umbrella, by Lindstrom and Eriksson (2005). This salutogenic umbrella embraces concepts that have been seen as assets and strengths for the individual that could reduce stress and promote the movement towards health.

Furthermore, there was also an inverse correlation between low self-efficacy and high ratings of fear of childbirth confirming previous studies (Lowe, 2000; Sieber et al., 2006; Salomonsson et al., 2013a). Promoting self-efficacy beliefs during pregnancy might act as an anxiety reducer and our suggestion is that we need to tackle the problem on two fronts, both by reducing anxiety and by strengthening and promoting childbirth self-efficacy. Strategies designated to increase women's childbirth self-efficacy should include at least one of the four sources that influence self-efficacy. The first and most effective source to strengthening self-efficacy is through a sense of mastery experience. The second source is by vicarious experiences, seeing role-models that are successful. The third source is through social persuasion. Finally, the fourth source to increase self-efficacy is by reducing somatic and emotional stress responses (Bandura, 1977). An interesting finding in the present study is the importance of vicarious others as a source for self-efficacy. A predictor for rating a high childbirth self-efficacy was if the woman had heard her sister's birth story. This is in accordance to Bandura's theory, which tells that people who are similar to oneself act as important role models (Bandura,

1977). Taheri et al. (2014) also found that self-efficacy could be strengthened by letting women with normal deliveries tell their stories to pregnant women. Perhaps this knowledge could be picked up and be used by antenatal educators? Strengthening the woman's own capacity can also be achieved by reducing stress reactions during pregnancy as has been suggested by Fisher et al. (2012). In this qualitative study the researchers tried to reduce physical reactions and minimise stress by using mindfulness training. Fisher et al. (2012) reported that mindfulness training made the women '*awakened of their existing potential, competence and ability*'. We can thus assume that the intervention increased the women's self-efficacy but this was not measured as it was a qualitative study.

The results of the logistic regression analysis (Table 5) showed that women's previous mental illness carried an increased risk for rating low on the childbirth self-efficacy scale. These findings are in agreement with Salomonsson et al. (2011) who showed that the women with the lowest self-efficacy had sought more help due to mental health problems than those with high self-efficacy. Today, we do not ask women about their self-efficacy at the antenatal clinic but we ask them about previous mental illness. It may be helpful to keep in mind that the question about previous mental illness could serve as an indicator also for low childbirth self-efficacy.

Another interesting finding in the present study was that women who reported high self-efficacy had less epidural analgesia compared to women with low self-efficacy. Previous studies have shown that women who report high childbirth self-efficacy experience have less intense labour pain (Stockman and Altmailer, 2001; Callister et al., 2001). Our finding is interesting, as to our knowledge, no other study has shown correlations between childbirth self-efficacy and the use of pain relief/choice of pain relief method during labour (Beebe et al., 2007; Berentson-Shaw et al., 2009; Stockman and Altmailer, 2001). Labour pain and pain relief is an important issue for women, although, epidural analgesia is an effective pain relief it is also an intervention that is associated with an increase in adverse complications such as prolonged second stage, instrumental delivery and urine retention (Anim-Somuah et al., 2011). This study highlights the interplay between different aspects of well-being and childbirth self-efficacy. Knowledge that can be used in various ways to boost up the woman's own assets and enable and reinforce the peak of self-efficacy before birth, which has been suggested to be highest in the third trimester (Sieber et al., 2006;Leap et al., 2010).

This study was limited because of the cross-sectional design, which means that we cannot explain the direction of association found. Secondly, the sample is from only one part in Sweden. To address this concern we tried to illuminate the entire county including women with diverse socio-economic conditions and residence for the sample. But the findings indicate that the sample included more prosperous women than average resulting in skewed curves and low ratings of the POMS subscales for depression, anger, tension, fatigue and confusion. Further, almost all women in the sample were living with a partner whom they also rated as supportive and thus, there were high scores on the MSSS. Therefore, the results must be interpreted with this limitation kept in mind.

The internal consistency for MSSS was also quite low, α 0.59 which is less than what is considered reliable (Nunally and Bernstein, 1998). An earlier study in Sweden among teenage mothers did not exhibit the same problem (Wahn and Nissen, 2008). The slightly low Cronbach's alphas value in our study is probably an indicator for the skewed distribution in combination with a small number of items (Streiner, 2003). But the instrument is not psychometrically tested within the Swedish culture, so we can only conclude that this should be done for future studies.

Conclusion and implication

Overall, the findings of the present study provide an important knowledge of the construct of childbirth self-efficacy. Self-efficacy is a positive dimension that interplays with other aspects and contributes to well-being during pregnancy and thereby, acts as an asset in the context of childbirth. Hence, more research should be encouraged to identify the causal relationships between childbirth self-efficacy and fear of childbirth. Further studies including valid and reliable measurement tools as CBSEI are needed when mapping the area and when intervention studies are performed. More studies showing the effects of self-efficacy on labour outcome are needed.

Conflict of interest

The authors declare that they have no conflict of interest.

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