



Quality of couple relationship among first-time mothers and partners, during pregnancy and the first six months of parenthood



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Introduction

Transition to parenthood has been described as one of the most radical changes that takes place in most people's lives [1]. The transition involves both physiological, psychological and social adjustments for the parental couple [2]. Even though parenthood can be an opportunity for growth for the parents, it can also be experienced as stressful [3,4]. Previous research [5–8], including a meta-analysis [9], have found that couple relationship quality is significantly lower after the transition to parenthood. The decline in relationship quality has been explained through different factors, such as: the changing roles from partners to parents; the increase in family stress [10] and marital conflict; less positive spousal interaction and a demanding task to combine childcare, household and workplace [11,12]. However, some parental couples report high relationship quality during the transition to parenthood [13,14]. Irrespective of whether the parents experience their relationship quality as stable or not, it is clear that childbirth and transition to parenthood is a sensitive period of the parents' lives.

The transition experienced by couples from partners to parents usually requires coping strategies [15] and the parental couples' ability to meet these challenges may be connected to their couple relationship quality. Nevertheless, an individual's ability to cope with stressors in life has previously been explained through his/hers Sense of Coherence [16]. A person's Sense of Coherence consists of three dimensions: *Comprehensibility* is about the person's sense of having her/his own life understandable and ordered; *Manageability* deals with the person's resources and skills to manage stressors in life, and *Meaningfulness* is about the person's overall sense that life is filled with meaning and purpose [16–18]. Together these three dimensions form a person's global orientation towards life in general. Strong Sense of Coherence is associated with resources to cope with various kinds of stressful life events or situations. Previously, it has been described that a person's Sense of Coherence is stable in adulthood as long as no radical life

events occur [18]. Sense of Coherence has also been explained as a continuously changing process throughout life [19]. During childbirth and the first years of parenthood, for instance, Sense of Coherence is changing [20,21]. However, there is a limited knowledge about the association between parents' Sense of Coherence and quality of couple relationship, during pregnancy and transition to parenthood.

In addition, social support has been described as an essential component for strengthening positive outcomes in families experiencing transitional life events, such as childbearing and child rearing [22,23]. Social support is offered within one's social network (e.g. family, friends and significant others) [24–26] and has been shown to reduce feelings of anxiety and stress among mothers during pregnancy and transition to motherhood [25,27]. Such support has also been shown to strengthen first-time mothers' relationship with partner and contribute to feelings of calmness and security about childbirth and parenting [28]. However, there is limited knowledge about parents' benefits from social support during pregnancy and transition to parenthood. Subsequently, further exploration of parents' perceived quality of couple relationship in relation to both their Sense of Coherence and perceived social support is needed. Therefore, the aim of the present study was to evaluate factors associated with quality of couple relationship, among first-time mothers and partners during pregnancy and the first six months of parenthood.

Methods

This study was a prospective longitudinal cohort study conducted in a county in south-western Sweden, with approximately 280,000 inhabitants. The county consists of urban, suburban and rural districts and is therefore representative of the general Swedish population. The county hospital labour ward has around 2700 births per year.

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Table 1
Measures included at the different times throughout the study.

	Q1 Gestational week 25	Q2 First week after birth	Q3 Six months after birth
Quality of Dyadic Relationship (QDR36) Dimensions: Consensus; Cohesion; Satisfaction; Sensuality and Sexuality. Score range 5–30. The higher the score, the higher perceived quality of dyadic relationship	X	X	X
Sense of Coherence (SOC-13) Dimensions: Comprehensibility; Manageability and Meaningfulness. Score range 13–91. The higher the score, the higher Sense of Coherence	X	X	X
The Multidimensional Scale of Perceived Social Support (MSPSS) Dimensions: Family; Friends and Significant others. Score range 12–84. The higher the score, the higher perceived social support	X	X	X
Feelings for Childbirth Score range 4–28. The higher the score, the more positive feelings for childbirth	X		
Partner's Feelings for Childbirth Score range 4–28. The higher the score, the more positive feelings for childbirth, among the respondent's partner. According to the respondent's perception	X		
Feelings for Parenthood Score range 4–28. The higher the score, the more positive feelings for parenthood	X		
Partner's Feelings for Parenthood Score range 4–28. The higher the score, the more positive feelings for parenthood, among the respondent's partner. According to the respondent's perception	X		

Participants and procedure

For the present study, expectant first-time mothers and partners who fulfilled the following criteria were asked of participation: (1) singleton pregnancy; (2) intention to give birth at the county hospital in the geographical area of the study and (3) ability to understand and speak Swedish. The expectant parents were recruited by midwives at antenatal units during a prenatal assessment in gestational week 25. The recruitment took place during September 2014 to January 2016.

Instruments

Data was collected with repeated questionnaires (Q) at: Gestational week 25 (Q1); First week after birth (Q2) and Six months after birth (Q3). The questionnaires (Q1, Q2 and Q3) included several different measurements (Table 1), as described in the following.

To assess quality of couple relationship at Q1, Q2 and Q3 QDR36 was used [29], which consists of 36 items forming a Likert scale from 1 to 6. The items are divided into five dimensions: *Dyadic Consensus* concerning family finances, decision making, household work, etc.; *Dyadic Cohesion* relates to common stimulating exchange of ideas, laughter or discussions, etc.; *Dyadic Satisfaction* includes variables about how often a divorce/separation has been considered, how often it work well between the couple, etc.; *Dyadic Sensuality* concerns how often the couple are hugging or kissing each other, etc.; *Dyadic Sexuality* contains variables that relate to sexual desire, and partners' attention of sexual needs etc. The quality of couple relationship was assessed by an index, which was the sum of the mean values from the five dimensions. Score range 5–30. The higher the score, the stronger perceived quality of couple relationship. QDR36 has been thoroughly described, tested and validated with its psychometric properties [29] (Table 1).

To assess the parents' Sense of Coherence at Q1, Q2 and Q3, SOC-13 was used. SOC-13 consists of 13 items divided into three dimensions: *Comprehensibility*; *Manageability* and *Meaningfulness*. Each item is scored on a Likert scale ranging from 1 to 7 [16,18]. Index is calculated by summing the results for all items, possible score range is between 13 and 91, the higher the score the higher the Sense of Coherence [16]. A validation study on SOC-13 used on pregnant women has been carried out earlier [30] and the Swedish version has been used for a long time [31] (Table 1).

The Multidimensional Scale of Perceived Social Support (MSPSS) was used to assess perceived social support [32] at Q1, Q2 and Q3. MSPSS includes twelve items which cover three dimensions: *Family*;

Friends and Significant others. Each item is rated on a seven-point Likert-type response format, ranging 1–7. Total score is calculated by summing the results for all items, possible score range 12–84, the higher the score the higher the perceived social support. A validation study on pregnant women has been carried out previously [33]. The Swedish version of MSPSS is validated among women with hirsutism and nursing students [34] (Table 1).

For the present study, questions were developed to assess the parents' feelings for childbirth (four questions) and parenthood (four questions) at Q1. The questions concern the expectant parents' feelings of expectation, joyfulness, preparation and security for childbirth and parenthood respectively. Each question was rated on a Likert scale from 1 to 7 (1 = very strongly disagree; 7 = very strongly agree). The feelings for childbirth were assessed using an index that was the sum of the results for all four questions. The feelings for parenthood were assessed equally. The possible score range was between 4 and 28 respectively, the higher the score the more positive feelings for childbirth or parenthood (Table 1). Furthermore, questions were developed to assess the expectant parent's perception about her/his partner's feelings for childbirth and parenthood. These questions were equal as for feelings for childbirth/parenthood, and indexes were calculated equally (Table 1). The following items: *Feelings for childbirth*; *Feelings for parenthood*; *Partner's feelings for childbirth* and *Partner's feelings for parenthood*, were designed for the present study and tested in two pilot-studies, as described in the following.

Pilot studies

To test participant information, composition of the questionnaires used for Q1, Q2 and Q3 and experiences of responding to the questionnaires two pilot studies were conducted before the present study, during 2014. In the first pilot study, 16 parents (both expectant and current parents) participated and answered the questionnaires in paper format. In the second pilot study 22 parents (both expectant and current parents) participated and answered the questionnaires using the web based computer system entitled Education Survey Automation Suite (EvaSys). The participants varied in terms of age, sociodemographic aspects and experiences of pregnancy and childbirth. During both pilot studies, some participants (three participants included in the first pilot study and two participants included in the second pilot study), described their experiences of responding to the questionnaires. The results of the pilot studies showed that participant information and composition of the questionnaires were for the most part understandable and manageable to the participants. After the pilot studies,

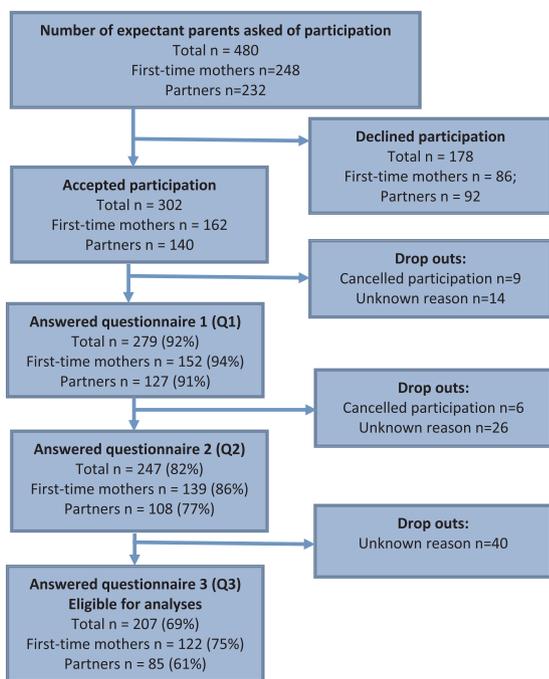


Fig. 1. Flowchart of longitudinal study, with response rate presented in n and (%): Q1 = Gestational week 25, year 2014–2015; Q2 = First week after childbirth; Q3 = Six months after childbirth.

minor changes were carried out to incorporate participant information within the questionnaires. These changes were carried out before data collection for the present study.

Data collection

Data was collected with web-based questionnaires (Q1, Q2 and Q3) using the EvaSys computer system. Q1 was sent to the participants via email in gestational week 25. The participants had the possibility to answer Q2 at the postnatal unit at the hospital, after birth. For those participants who did not answer Q2 in the hospital, the questionnaire was sent via email during the first week after birth. Q3 was sent via email six months after birth. For those participants who did not answer the questionnaires, up to three reminders were sent at each of the three time points (Q1, Q2 and Q3). The response rate for the questionnaires is presented in Fig. 1.

Statistical analysis

For the statistical registration and analyses of the data, the Statistical Package for the Social Sciences (SPSS) version 22 was used. Descriptive statistics were carried out in order to present socio-demographics for the participants (Table 2). Index and dimensions for measurements included were calculated (Tables 2 and 3).

To consider the distribution of different variables (QDR36; SOC-13 and MSPSS), we made histograms. The histograms showed that some of the variables were not normally distributed (MSPSS at Q1; MSPSS at Q2; MSPSS at Q3 and SOC-13 change between Q1 and Q3). Therefore, the non-parametric Friedman’s test was used to compare participants’ perceived couple relationship quality, social support and Sense of Coherence at different time points. Comparisons were made between Q1 and Q2, Q2 and Q3 and between Q1 and Q3. This was done separately for first-time mothers and partners. After a statistically significant Friedman’s test, the Wilcoxon Signed Rank test for post hoc testing was performed. Within Table 4, results from the Wilcoxon Signed Rank test are presented. Effect size was presented as η^2 (Eta-squared) (Table 4). Cohens’s guidelines were used to interpret clinical change, and the

Table 2 Overview of characteristics and measurements at different times throughout the study.

Gestational week 25 (Q1)		
Characteristics	First-time mothers (n = 122)	Partners (n = 85)
Age (yrs.), Mean (SD), Range	27.8 (4.2), 19–40	30.1 (5.9), 20–55
Country of birth, n (%)		
Sweden	115 (94)	83 (98)
Norway, Finland, Denmark, Island	2 (2)	0 (0)
Europe	2 (2)	1 (1)
Other country outside Europe	3 (2)	1 (1)
Education, n (%)		
Compulsory school	2 (2)	1 (1)
High school	45 (37)	59 (69)
University	75 (61)	25 (29)
Education (yrs.), Mean (SD), Range	14.2 (2.4), 9–21	13.3 (2.1), 9–20
Non-response, n (%)	1 (1)	3 (4)
Civil status, n (%)		
Married	23 (19)	20 (24)
Cohabiting	97 (79)	63 (74)
Not living together	1 (1)	2 (2)
Couple relationship, (yrs.), Mean (SD), Range	4.7 (3.2), 1–19	4.9 (3.1), 1–18
Non-response, n (%)	0 (0)	2 (2)
Expecting first child, n (%)		
Yes	122 (100)	79 (93)
No	0 (0)	6 (7)
Measurements		
Feelings for childbirth, Mean (SD), Range		
Feelings for childbirth	22.3 (3.2), 12–28	23.3 (3.0), 12–28
Non-response, n (%)	3 (2)	1 (1)
Partner’s feelings for childbirth	22.4 (3.4), 14–28	23.3 (3.4), 10–28
Non-response, n (%)	3 (2)	1 (1)
Feelings for parenthood, Mean (SD), Range		
Feelings for parenthood	24.8 (2.5), 15–28	24.7 (2.8), 16–28
Non-response, n (%)	1 (1)	0 (0)
Partner’s feelings for parenthood	24.4 (3.0), 16–28	25.6 (2.1), 19–28
Non-response, n (%)	1 (1)	0 (0)
Six months after childbirth (Q3)		
Characteristics	First-time mothers (n = 122)	Partners (n = 85)
Employment, n (%)		
Employed outside home	2 (2)	61 (72)
On parental leave	108 (89)	2 (2)
Student	1 (1)	5 (6)
Unemployed	0 (0)	1 (1)
Other	4 (3)	6 (7)
Non-response	7 (6)	10 (12)
Perceived economy, n (%)		
Very good	8 (7)	7 (8)
Good	40 (33)	40 (47)
Sufficient	62 (51)	24 (28)
Strained	5 (4)	4 (5)
Non-response	7 (6)	10 (12)

Measurements:
 Feelings for childbirth/Partner’s feelings for childbirth: range 4–28.
 Feelings for parenthood/Partner’s feelings for parenthood: range 4–28.

effect was defined as small ($\eta^2 > 0.01$), medium ($\eta^2 > 0.06$), or large ($\eta^2 > 0.14$) [35]. Calculations of effect size were carried out for: change in index (QDR36; SOC-13 and MSPSS) between Q1 and Q2, Q2 and Q3 and between Q1 and Q3, and; change in dimensions (QDR36; SOC-13 and MSPSS) between Q1 and Q3.

In order to compare differences between first-time mothers’ and partners’ perceived couple relationship quality, social support and Sense of Coherence at Q1, Q2 and Q3; the Kruskal-Wallis equality of populations rank test was carried out [36]. After a statistically significant Kruskal-Wallis test, the Dunn non-parametric comparison for post hoc testing was performed. The level of significance was defined as

Table 3
Overview of index and dimensions at different times throughout the study.

	Q1 Gestational week 25		Q2 First week after birth		Q3 Six months after birth	
	First-time mothers M (SD), MD, range	Partners M (SD), MD, range	First-time mothers M (SD), MD, range	Partners M (SD), MD, range	First-time mothers M (SD), MD, range	Partners M (SD), MD, range
QDR36 index	24.5 (2.3), 25.0, 18.6–28.5	24.5 (1.9), 24.5, 20.6–28.9	25.4 (2.0), 25.7, 19.3–29.0	25.0 (1.9), 25.2, 21.3–29.4	24.1 (2.4), 24.4, 16.2–29.1	23.4 (2.6), 23.9, 15.1–29.0
<i>Dimensions</i>						
Consensus	5.2 (0.5), 5.2	5.1 (0.5), 5.1	5.4 (0.4), 5.5	5.2 (0.7), 5.3	5.2 (0.5), 5.2	5.1 (0.5), 5.1
Cohesion	4.9 (0.7), 5.0	4.9 (0.7), 5.0	5.2 (0.7), 5.5	5.2 (0.7), 5.3	4.8 (0.9), 5.0	4.7 (0.8), 5.0
Satisfaction	5.1 (0.5), 5.3	5.1 (0.5), 5.2	5.3 (0.4), 5.4	5.2 (0.4), 5.3	5.0 (0.6), 5.1	5.0 (0.6), 5.2
Sensuality	5.5 (0.6), 5.8	5.5 (0.6), 5.6	5.5 (0.6), 5.6	5.3 (0.6), 5.6	5.1 (0.8), 5.2	5.0 (0.9), 5.2
Sexuality	4.1 (0.7), 4.2	4.1 (0.7), 4.0	4.0 (0.7), 4.0	4.0 (0.6), 4.0	3.9 (0.7), 4.0	3.8 (0.8), 3.8
SOC-13 index	66.0 (12.3), 68.0, 32–91	69.8 (10.7), 71.0, 40–89	71.7 (11.5), 74.5, 37–89	72.9 (10.0), 73.0, 43–90	70.7 (12.2), 74.0, 34–90	71.4 (12.0), 75.0, 40–91
<i>Dimensions</i>						
Comprehensibility	24.2 (5.7), 25.0	26.2 (4.9), 27.0	26.2 (5.5), 28.0	27.0 (4.7), 27.0	25.9 (5.7), 27.5	26.6 (5.6), 28.0
Manageability	19.6 (4.4), 20.0	21.6 (3.6), 22.5	21.6 (4.0), 22.0	22.6 (3.3), 23.0	21.3 (4.3), 23.0	22.2 (3.4), 23.0
Meaningfulness	22.3 (3.6), 23.0	22.0 (3.7), 23.0	23.8 (3.5), 25.0	23.2 (3.3), 24.0	23.4 (3.7), 24.0	22.7 (3.4), 24.0
MSPSS index	74.2 (10.2), 77.0, 35–84	71.1 (10.9), 74.0, 29–84	79.4 (6.8), 82.0, 55–84	76.6 (8.4), 80.0, 52–84	74.5 (10.0), 77.0, 41–84	70.6 (11.3), 72.0, 38–84
<i>Dimensions</i>						
Family	24.2 (5.0), 26.0	23.5 (4.5), 25.0	26.3 (3.2), 28.0	25.7 (3.2), 27.5	24.3 (4.5), 26.0	24.3 (4.0), 26.0
Friends	23.5 (4.6), 24.0	22.6 (4.5), 24.0	25.6 (3.5), 28.0	23.9 (4.7), 26.0	23.6 (4.6), 25.0	21.9 (4.9), 23.0
Significant others	26.5 (3.0), 28.0	25.0 (3.8), 26.0	27.6 (1.4), 28.0	27.6 (3.2), 28.0	26.6 (2.5), 28.0	24.6 (4.0), 27.0

Score range:

QDR36-index: theoretical range 5–30, dimensions: range 1–6.

SOC-13-index: theoretical range 13–91, dimensions: Comprehensibility range 5–35; Manageability range 4–28, Meaningfulness range 4–28.

MSPSS-index: theoretical range 12–84, dimensions: range 4–28.

M = mean; SD = standard deviation; MD = median.

$p < 0.05$.

To evaluate which were the strongest associated factors with first-time mothers' and partners' perceived quality of couple relationship six months after birth, multiple linear regression analyses were used [37]. The analysis was performed in different steps, using index for QDR36 at Q3 (that was normally distributed) as a dependent variable. Background and independent variables were theoretically decided from

previous research results. For SOC-13 and MSPSS, both index at Q1 and the change in index between Q1 and Q3 were used as independent variables. This was done to evaluate whether it was the Q1 (baseline) level of the index (SOC-13 and/or MSPSS at Q1), the change in index between Q1 and Q3, or both Q1 level and change in index that were associated with parents' perceived quality of couple relationship, six months after childbirth. Another intent with performing the multiple

Table 4
Change over time in index and dimensions throughout the study.

	Change between Q1 and Q2				Change between Q2 and Q3				Change between Q1 and Q3			
	First-time mothers		Partners		First-time mothers		Partners		First-time mothers		Partners	
	p-value	η^2	p-value	η^2	p-value	η^2	p-value	η^2	p-value	η^2	p-value	η^2
QDR36 index	0.132	0.035 [†]	0.085	0.066 ^{**}	< 0.001 ^{***}	0.411 ^{***}	< 0.001 ^{***}	0.528 ^{***}	0.001 ^{***}	0.144 ^{***}	< 0.001 ^{***}	0.365 ^{***}
<i>Dimensions</i>												
Consensus	§	§	§	§	§	§	§	§	0.792	0.001	0.363	0.012 [*]
Cohesion	§	§	§	§	§	§	§	§	0.072	0.029 [†]	0.019 [*]	0.076 ^{**}
Satisfaction	§	§	§	§	§	§	§	§	0.010 ^{**}	0.076 ^{**}	0.042 [*]	0.072 ^{**}
Sensuality	§	§	§	§	§	§	§	§	< 0.001 ^{***}	0.283 ^{***}	< 0.001 ^{***}	0.358 ^{***}
Sexuality	§	§	§	§	§	§	§	§	0.059	0.035 [†]	0.002 ^{**}	0.144 ^{***}
SOC-13 index	< 0.001 ^{***}	0.308 ^{***}	0.001 ^{**}	0.130 ^{**}	0.771	0.001	0.191	0.025 [*]	< 0.001 ^{***}	0.239 ^{***}	0.010 ^{**}	0.092 ^{**}
<i>Dimensions</i>												
Comprehensibility	§	§	§	§	§	§	§	§	< 0.001 ^{***}	0.139 ^{**}	0.172	0.026 [*]
Manageability	§	§	§	§	§	§	§	§	< 0.001 ^{***}	0.222 ^{***}	0.029 [*]	0.066 ^{**}
Meaningfulness	§	§	§	§	§	§	§	§	0.001 ^{**}	0.095 ^{**}	0.025 [*]	0.068 ^{**}
MSPSS index	< 0.001 ^{***}	0.346 ^{***}	< 0.001 ^{***}	0.416 ^{***}	< 0.001 ^{***}	0.302 ^{***}	< 0.001 ^{***}	0.437 ^{***}	0.214	0.014 [*]	0.536	0.005
<i>Dimensions</i>												
Family	§	§	§	§	§	§	§	§	0.508	0.015 [†]	0.484	0.036 [*]
Friends	§	§	§	§	§	§	§	§	0.206	0.014 [*]	0.108	0.035 [*]
Significant others	§	§	§	§	§	§	§	§	0.572	0.003	0.295	0.015 [†]

Results from non-parametric test (Wilcoxon Signed Rank test) and effect size calculation η^2 = Eta-squared [35].

p-values: ^{*} $p < 0.05$, ^{**} $p < 0.01$, ^{***} $p < 0.001$.

η^2 interpretation sensu Cohen [35]: ^{*} > 0.01 small effect, ^{**} > 0.06 medium effect; ^{***} > 0.14 large effect.

§: not calculated.

regression analysis in steps was to reduce the number of independent variables analyzed simultaneously. The different steps in the multiple linear regression analysis, were performed as follows: *Step 1* included only background variables entered simultaneously, to evaluate their associations with QDR36 at Q3. The background variables: age; education and length of couple relationship were originally included but excluded since they were not significant. Cohabiting/not, employed/not and perceived economy were kept; *Step 2* includes each of the other independent variables separately, controlling for background variables; *Step 3* included the independent variables that were significant for either first-time mothers or partners at step 2, controlling for background variables. The variables were included in blocks that were theoretically decided (*Block 1* included variables concerning feelings for childbirth; *Block 2* included variables concerning feelings for parenthood, and *Block 3* included variables concerning support and coping); *Step 4* included all variables that were significant at Step 3 and background variables, entered simultaneously. P-values less than 0.05 were regarded as statistically significant.

Non-respondents

Participants who did not respond to all three questionnaires were excluded from analysis. To evaluate differences between respondents (participants who responded to all three questionnaires) and non-respondents (parents who responded to one or two questionnaires), separate analyses were carried out for first-time mothers and partners respectively: *Kruskal-Wallis equality of populations rank tests* were used for ordinal variables and χ^2 -test for discrete variables. The Dunn non-parametric comparison for post hoc testing was performed after a statistically significant Kruskal-Wallis test.

Ethical considerations

The Regional Ethical Review Board in Gothenburg, Sweden approved the study (Dnr: 197–14; Dnr T: 623–14). The participants were given information about the study, told that they could withdraw their participation at any time and subsequently filled in a consent form.

Results

In total, 302 expectant first-time mothers (n = 162) and partners (n = 140) accepted to participate in the present study. Those 207 participants who responded to all three questionnaires were eligible for analysis (first-time mothers n = 122; partners n = 85) (Fig. 1). Descriptive statistics are presented in Table 2.

Change over time in perceived quality of couple relationship (QDR36)

Results from the Wilcoxon Signed Rank test showed that the perceived quality of couple relationship did not change significantly between pregnancy (Q1) and first week after childbirth (Q2) (Tables 3 and 4, Fig. 2). There was a decrease in both first-time mothers' (p = 0.001) and partners' (p < 0.001) perceived quality of couple relationship between pregnancy (Q1) and six months after birth (Q3). There was

also a decrease between first week after childbirth (Q2) and six months after childbirth (Q3), among both first-time mothers (p < 0.001) and partners (p < 0.001). Both the decrease between Q1 and Q3 (first-time mothers: $\eta^2 = 0.144$; partners: $\eta^2 = 0.365$) and between Q2 and Q3 (first-time mothers: $\eta^2 = 0.411$; partners: $\eta^2 = 0.528$) showed large effect size (Table 4).

For the five dimensions of QDR36, there was a decrease between Q1 and Q3 for: partners' cohesion (p = 0.019); first-time mothers' and partners' satisfaction (first-time mothers: p = 0.010; partners: p = 0.042); first-time mothers' and partners' sensuality (first-time mothers: p < 0.001; partners: p < 0.001), and partners' sexuality (p = 0.002) (Table 4). This indicates that first-time mothers' perceived couple relationship satisfaction and sensuality decrease between pregnancy and six months after childbirth. Likewise, partners' cohesion, satisfaction, sensuality, and sexuality decreased (Table 4). When comparing first-time mothers' QDR36 index with partners' QDR36 index at Q1, Q2 and Q3 respectively, results from the Dunn non-parametric comparison for post hoc testing showed no statistically significant differences.

Change over time in Sense of Coherence (SOC-13)

Results from the Wilcoxon Signed Rank test showed that both first-time mothers (p < 0.001) and partners (p = 0.001) reported higher Sense of Coherence first week after childbirth (Q2) compared to the pregnancy (Q1) (Tables 3 and 4, Fig. 2). They also reported higher Sense of Coherence six months after childbirth (Q3) compared to the pregnancy (Q1) (first-time mothers: p < 0.001; partners: p = 0.010) (Tables 3 and 4, Fig. 2). For the change in Sense of Coherence between Q1 and Q2 (first-time mothers: $\eta^2 = 0.308$; partners: $\eta^2 = 0.130$), as well as between Q1 and Q3 (first-time mothers: $\eta^2 = 0.239$; partners: $\eta^2 = 0.092$), results showed large effect size for first-time mothers and medium effect size for partners (Table 4). When comparing differences between first-time mothers and partners in regard to their Sense of Coherence at Q1, Q2 and Q3; the results showed that partners' Sense of Coherence was higher during pregnancy, compared to first-time mothers' (p = 0.039).

For the three dimensions, the results showed the following changes between Q1 and Q3: first-time mothers' higher comprehensibility at Q3 (p < 0.001); first-time mothers' and partners' higher manageability at Q3 (first-time mothers: p < 0.001; partners: p = 0.029); first-time mothers' and partners' higher meaningfulness at Q3 (first-time mothers: p = 0.001; partners: p = 0.025) (Table 4). This indicates that first-time mothers' comprehensibility, manageability and meaningfulness increase between pregnancy and six months after childbirth. Likewise, partners' manageability and meaningfulness increase.

Change over time in perceived social support (MSPSS)

Results from the Wilcoxon Signed Rank test showed that the change over time for perceived social support increased between pregnancy (Q1) and first week after childbirth (Q2), among both first-time mothers (p < 0.001) and partners (p < 0.001) (Tables 3 and 4, Fig. 2). Thereafter, perceived social support decreased between first week after



Fig. 2. Index change (mean values) related to first-time mothers' and partners' perceived Quality of Dyadic Relationship (QDR36), Sense of Coherence (SOC-13) and perceived Social Support (MSPSS) at Q1, Q2 and Q3.

childbirth (Q2) and six months after childbirth (Q3) (first-time mothers: $p < 0.001$; partners: $p < 0.001$) (Tables 3 and 4, Fig. 2). For both first-time mothers and partners, the increase between Q1 and Q2 (first-time mothers: $\eta^2 = 0.346$; partners: $\eta^2 = 0.416$), as well as the decrease between Q2 and Q3 (first-time mothers: $\eta^2 = 0.302$; partners: $\eta^2 = 0.437$) showed large effect size (Table 4). When comparing first-time mothers' and partners' perceived social support at Q1, Q2 and Q3 using the Dunn non-parametric comparison for post hoc testing; the results showed significant higher perceived social support among first-time mothers (compared to partners) both during pregnancy, first week after childbirth and six months after childbirth (Q1: $p = 0.017$; Q2: $p = 0.012$; Q3: $p = 0.014$).

Results from the Wilcoxon Signed Rank test showed no significant difference between Q1 and Q3 for the three separate dimensions: Family; Friends and Significant others (Table 4).

Factors associated with perceived quality of couple relationship (QDR36) six months after childbirth

Results showed that within the fourth and last step for the multiple linear regression analysis, among first-time mothers four factors had statistically significant associations to better perceived couple relationship quality six months after childbirth (Table 5): (1) Partners with higher positive feelings for parenthood at gestational week 25 ($p = 0.021$); (2) Higher perceived social support at gestational week 25 ($p = 0.037$); (3) Higher Sense of Coherence at gestational week 25 ($p = 0.013$) and (4) More positive change in Sense of Coherence between gestational week 25 and six months after childbirth ($p = 0.002$). Among partners, one factor was statistically significant: More positive change in perceived social support between gestational week 25 and six months after childbirth ($p = 0.005$) (Table 5).

Non-respondents

Parents who did not respond to all three questionnaires were excluded from analysis (first-time mothers $n = 40$; partners $n = 55$). When comparing respondents with non-respondents the results showed that; non-respondent first-time mothers reported higher Sense of Coherence six months after birth (MD = 77.0) compared to respondent first-time mothers (MD = 73) ($p = 0.048$), and non-respondent partners reported higher perceived quality of couple relationship six months after birth (MD = 25.1) compared to respondent partners (MD = 23.4) ($p = 0.029$). This indicates that first-time mothers with higher Sense of Coherence and partners with higher perceived quality of couple relationship six months after childbirth, tend to not respond to repeated questionnaires during childbirth and the first six months of parenthood.

Discussion

For the present study, the aim was to evaluate factors associated with quality of couple relationship, among first-time mothers and partners during pregnancy and the first six months of parenthood. The results revealed that social support was an associated factor with both first-time mothers' and partners' higher quality of couple relationship, six months after childbirth. Previously, social support has been described as non-associated with quality of couple relationship among parents [38]. On the other hand, social support has also been suggested as an essential component for strengthening positive outcomes in families experiencing transition to parenthood [23], as well as to strengthen couple relationship among parents [28]. However, the results of the present study show that the first-time mothers perceived higher social support compared to the partners, both during pregnancy, first week after childbirth and six months after childbirth. The fact that the first-time mothers perceived more social support during pregnancy (compared to partners), could be because her physiological pregnancy

changes made others (family, friends and significant others) more attentive to her situation. Furthermore, most of the first-time mothers included in the present study were on parental leave six months after childbirth. Therefore, they were probably the main caretakers of the baby which might have made them feel more comfortable about asking for support from their social network (compared to partners). Consequently, this might explain the results that the first-time mothers perceived more social support than partners.

The present study demonstrated that the first-time mothers who stated a higher Sense of Coherence both during pregnancy and at six months after childbirth did report higher perceived quality of couple relationship. This is in line with earlier research [8,20,29,38]. Previously, it has been described that high Sense of Coherence can help parental couples conceptualize the world as meaningful, comprehensible and manageable. This may be important for the way parents perceive and cope with the challenges that come with childbirth and parenthood [39]. Besides this, a strong Sense of Coherence is related to better family functioning overall. This may be because of the parental couple's shared mutual goals in bringing up a child, as well as shared motivation to mobilize available resources to deal with parenthood [8]. However, the results of the present study showed that the partners' Sense of Coherence was not significantly associated with their quality of couple relationship six months after birth. This might be explained by lack of power due to the limited number of partners eligible for analysis. The results may also be influenced by the fact that Swedish mothers, to a larger extent than partners, are on parental leave the first months after childbirth to take care of the baby, while the partners are employed outside home. It may be the case that partners' Sense of Coherence plays a greater role when the baby grows and becomes more independent of the mother [21,38]. Therefore, Sense of Coherence in relation to partners' perceived quality of couple relationship needs further exploration. Nevertheless, both first-time mothers' and partners' Sense of Coherence increased between gestational week 25 and six months after childbirth. Similar results have previously been shown [8,20,30]. Subsequently, this indicates that childbirth and transition to parenthood have positive effects on first-time mothers' and partners' abilities to cope with life as comprehensible, manageable and meaningful.

Nevertheless, the results that associated factors seemed to differ between first-time mothers' and partners' higher perceived quality of couple relationship is interesting. This may indicate that first-time mothers and partners possess different needs during the transition to parenthood. For instance, first-time mothers who perceived their partner with more positive feelings for parenthood during pregnancy, perceived higher quality of couple relationship six months after childbirth. This result contributes with valuable knowledge for health professionals who meet expectant first-time mothers and partners. Hence professional support during pregnancy has earlier been shown to: include partners in preparations for parenthood [40]; facilitate first-time mothers' and partners' couple relationship [41–43]; increase parental knowledge and entail better preparation for childbirth [40,44] and infant care [45]. In this regard, it is vital that the partner's role is included in the professional support. Fathers who take an active role during birth seem to better support the mother [46] and experience their first meeting with their baby more positively [47]. Co-mothers (parent from same-sex relationship, i.e. lesbian partner) who are being recognized by professionals in midwifery care, feel appreciated for their qualities [48]. Obviously, parents' individual needs should be included in professional support, regardless of the parent's role or gender. However, the results of the multiple linear regression analysis within the present study, showed that more associations were significant for first-time mothers' (compared to partners') higher perceived quality of couple relationship. When considering this result, it is valuable to bear in mind that the sample size for first-time mothers ($n = 122$) was larger than for partners ($n = 85$). The larger number of significant associations among mothers could be due to larger number of observations and

Table 5
Covariates of perceived quality of couple relationship (QDR36) six months after childbirth (Q3). Results from multiple linear regressions, performed in steps (mothers n = 122; partners n = 85).

	Step 1 (one model)				Step 2 (12 models)				Step 3 (three model)				Step 4 (one model)			
	First-time mothers		Partners		First-time mothers		Partners		First-time mothers		Partners		First-time mothers		Partners	
	β	p-value	β	p-value	β	p-value	β	p-value	β	p-value	β	p-value	β	p-value	β	p-value
Cohabiting with partner, Q1 ¹ (ref. not living together)	1.87	.434	-4.63	.010*	\$	\$	\$	\$	\$	\$	\$	\$	3.06	.172	-1.89	.306
Employment, Q3	-4.28	.013*	.90	.219	\$	\$	\$	\$	\$	\$	\$	\$	-1.96	.250	.94	.159
Perceived economy, Q3	.33	.313	.92	.021*	\$	\$	\$	\$	\$	\$	\$	\$	-1.10	.750	.26	.526
Age, (yrs.) ²			.02	.702			-.07	.180								
Education, (yrs.) ²			.13	.182			.01	.953								
Couple relationship, (yrs.) ²			-.05	.485			.01	.983								
Expecting first child					.93	.410										
Feeling for childbirth, Q1			.22	.004**			.08	.480								
Partner's feeling for childbirth, Q1			.18	.008**			.02	.830								
									Block 1							
									0.16	.065	.09	.497				
									.12	.123	-.01	.902				
Feeling for parenthood, Q1			.30	.004**			.02	.893								
Partner's feeling for parenthood, Q1			.28	.000***			.10	.513								
									.14	.283	-.04	.775				
									.21	.034*	.13	.486	.19	.021*	.01	.941
									Block 2							
									.06	.004**	.07	.055	.06	.013*	.06	.064
SOC-13, Q1			.09	.000***			.10	.001**	.08	.003**	.06	.119	.08	.002**	.06	.124
SOC-13 change, Q1-Q3			.09	.000***			.10	.015*	.08	.003**	.06	.119	.08	.002**	.06	.124
MSPSS, Q1			.10	.000***			.07	.005**	.09	.001**	.05	.101	.06	.037*	.05	.087
MSPSS change, Q1-Q3			.12	.002**			.15	.000***	.07	.055	.11	.011*	.07	.085	.12	.005**

P-values: *p < 0.05; **p < 0.01; ***p < 0.001.

§ included in the analyses, but not present since the values change between models.

¹ A variable with two categories: cohabiting and not living together.

² Linear representation.

better statistical power. Therefore, the differences between first-time mothers' and partners' perceived quality of couple relationship during the transition to parenthood needs further exploration.

According to the results of the present study both first-time mothers and partners perceived a decrease in their quality of couple relationship between pregnancy and the first six months after childbirth, which has been shown before [8]. It is previously known that the demands of new parenthood are accompanied with an increase in family stress, lack of intimacy, insufficient communication [11] and a demanding task to combine childcare, household duties and the workplace [12]. Subsequently, the decrease in relationship quality could be a testimony to the challenges that parental couples seem to encounter during transition to parenthood. Therefore, the results from the present study that transition to parenthood entailed a decline in relationship satisfaction but an increase in Sense of Coherence among the parents are interesting. This may indicate that childbirth and transition to parenthood have a positive effect on parents' abilities to make sense of meaning. Since the increase in Sense of Coherence may reflect that parents, while facing a new reality with some strain and decrease in relationship satisfaction, are also provided with (or constructing) a new sense of meaning, purpose and direction in life – i.e. fostering a new human being. Subsequently, childbirth and transition to parenthood is a complex phenomenon. These major life events should be experienced with access to support for the parents, according to the results of the present study. Professionals can use this knowledge when supporting parents during childbirth and transition to parenthood. Earlier, it has been revealed that when expectant first-time mothers and partners mutually receive professional support, it could facilitate their better communicative abilities togetherness and understanding for each other [41–43]. Professionals could also facilitate social connections for the parents, via antenatal education classes for example [41,42,49]. Besides this, professionals can strive to strengthen the parents in their abilities to cope as a parental couple and with life as comprehensible, manageable and meaningful.

It is valuable to note that the informants for the present study represented a lower mean age (first-time mothers' mean age 27.8; partners' mean age 30.1), compared to Swedish first-time mothers' and first-time fathers' populations (first-time mothers' mean age 28.0; first-time fathers' mean age 31.5) [50]. This might have had an influence on the results. Besides this, non-Swedish speaking parents and mothers giving birth two or more times were excluded in the present study; this could be considered as a limitation. Furthermore, no power analysis was conducted, which could be considered as a limitation. However, previous research has claimed that sample size should be at least 10–15 individuals per independent variable when carrying out multiple regression analysis [51]. Which is in line with the analysis provided within the present study. Further, based on simulated data De Winter [52] argues that for bivariate analyses it is sufficient with five or even fewer observations. This corresponds to five (or fewer) observations per degree of freedom. In addition, similar results have been reported previously [29,38]; this further indicates satisfactory power of analysis for the present study and that the present sample size is appropriate for the number of variables included in the analyses.

However, the limitation of a follow-up design is the reduced number of participants to follow up. For the current study, a total loss of 31% was present (302 parents completed the first questionnaire, 207 parents were eligible for analysis). One explanation for the loss of participants could be that the parents might have prioritized taking care of the child instead of answering questionnaires. In addition, the results from analyses between respondents and non-respondents indicates that first-time mothers with higher Sense of Coherence and partners with higher perceived quality of couple relationship, tend to not respond to repeated questionnaires during childbirth and transition to parenthood. However, the longitudinal design of the study can be considered as a strength, since both first-time mothers and partners were approached and answered the same questions about quality of couple relationship,

social support, Sense of Coherence and feelings for childbirth and parenting.

Conclusion

First-time mothers' higher perceived quality of couple relationship six months after childbirth was associated with their: Partner's more positive Feelings for Parenthood; higher Perceived Social Support during Pregnancy; higher Sense of Coherence during Pregnancy; as well as their more positive Change in Sense of Coherence between Pregnancy and Six Months after Birth. Partners higher perceived quality of couple relationship was associated with their: more positive change in Perceived Social Support between Pregnancy and Six Months after Birth. Both the first-time mothers and partners perceived lower quality of couple relationship at six months after birth compared to during pregnancy. They also reported higher Sense of Coherence six months after birth, compared to during pregnancy. Consequently, this indicates that childbirth and transition to parenthood have positive impact on parents' abilities to cope with life even though their quality of couple relationship decrease during transition to parenthood.

Conflict of interest

The authors have no conflict of interest.

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Appendix A. Supplementary material

Supplementary data associated with this article can be found, in the online version, at <https://doi.org/10.1016/j.srhc.2018.07.001>.

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