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ORIGINAL RESEARCH – QUANTITATIVE

Factors influencing maternal distress among Dutch women with a healthy pregnancy

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ABSTRACT

Background: Maternal distress is a public health concern. Assessment of emotional wellbeing is not integrated in Dutch antenatal care. Midwives need to understand the influencing factors in order to identify women who are more vulnerable to experience maternal distress.
Objective: To examine levels of maternal distress during pregnancy and to determine the relationship between maternal distress and aetiological factors.
Methods: A cross-sectional study including 458 Dutch-speaking women with uncomplicated pregnancies during all trimesters of pregnancy. Data were collected with questionnaires between 10 September and 6 November 2012. Demographic characteristics and personal details were obtained. Maternal distress was measured with the Edinburgh Depression Scale (EDS), State-Trait Anxiety Inventory (STAI), and Pregnancy-Related Anxiety Questionnaire (PRAQ). Behaviour was measured with Coping Operations Preference Enquiry-Easy (COPE-Easy). Descriptive statistics and multiple linear regression analysis were used.
Results: Just over 20 percent of the women in our sample (21.8%) had a heightened score on one or more of the EDS, STAI or PRAQ. History of psychological problems ($B = 1.071$; $p = .001$), having young children ($B = 2.998$; $p = .001$), daily stressors ($B = 1.304$; $p = <.001$), avoidant coping ($B = 1.047$, $p = <.001$), somatisation ($B = .484$; $p = .004$), and negative feelings towards the forthcoming birth ($B = .636$; $p = <.001$) showed a significant positive relationship with maternal distress. Self-disclosure ($B = -.863$; $p = .004$) and acceptance of the situation ($B = -.542$; $p = .008$) showed a significant negative relationship with maternal distress.
Conclusion: Maternal distress occurs among women with a healthy pregnancy and is significantly influenced by a variety of factors. Midwives need to recognise the factors that make women more vulnerable to develop and experience maternal distress in order to give adequate advice about how to best cope with this condition.

1. Introduction

Maternal distress refers to a spectrum of psychological, emotional and behavioural symptoms during pregnancy, birth and the postnatal period.[1] Levels of maternal distress vary, ranging along a continuum. This continuum extends from daily worries and limited psychosocial disharmony, to major symptoms of emotional tension and mental strains with a considerable unbalanced psychosocial functioning.[2–4] Depression, stress and anxiety are the most commonly mentioned constructs of maternal distress[1,2,4,5] and they often co-occur.[4,6,7]

There is increasing evidence that maternal distress among otherwise healthy pregnant women can be a predictor for negative birth outcomes, including low birth weight and prematurity.[8,9] Additionally, adverse short and long-term post partum mental health effects have been reported for both mother and child,

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including post-partum depression and post-traumatic stress,[6,10–13] psychiatric morbidity,[14] and impaired child behavioural, cognitive and emotional development.[15–17] With rates of maternal distress varying between 10% and 41%, the detrimental health effects of the condition have been recognised as a worldwide public health concern.[18] Prevalence rates of maternal distress among Dutch women vary between 2.3% and 33.3%, depending on the constructs of maternal distress being measured (i.e. depression, anxiety).[8,10,19–21]

Dutch government policy directs that women with healthy pregnancies receive midwife-led antenatal care. As a result, more than 80% of pregnant women in the Netherlands begin their care with a midwife.[22,23] Given the relatively high rate of maternal distress, midwives must be alert for the presence or development of (psychosocial) risk factors or complications.[24]

The Dutch Steering Committee for Pregnancy and Birth[25] expressed concern about the prevalence and the adverse affects of maternal distress for maternal and child health, seeing prevention and reduction of maternal distress as a critical goal of maternity care services. In order to provide adequate care, maternity healthcare providers need to be aware of the factors that relate to the prevalence of maternal distress. In response to the concerns of the steering committee the Project 'Promoting Healthy Pregnancy (2011–2015)' was established. The four-year project aims to develop an antenatal midwife-led intervention to contribute to the reduction of maternal distress. Part of the intervention includes the change of midwives' behaviour with regard to the antenatal management of maternal distress, as earlier research has shown that in particular the majority of Dutch midwives do not routinely screen for maternal distress.[26] Other studies confirm that midwives' antenatal assessment of psychological and mental wellbeing and risk factors are not integrated in existing antenatal practice.[27,28] This deficiency in the assessment of maternal distress limits the identification of women who are experiencing maternal distress and women who are more vulnerable to develop maternal distress. This complicates further support and care.

We conducted this study as part of the project Promoting Healthy Pregnancy, in order to bridge the gap in midwives' understanding about the factors that are related to maternal distress. We need to better understand the specific factors that can help identify women who are more susceptible to experience maternal distress during pregnancy.[29] Various studies have looked at factors that influence maternal distress among women with healthy pregnancies from different perspectives, such as personal characteristics,[30–32] history,[12,13,30,32–38] and circumstances,[12,13,30–39] coping styles,[2,12,38–40,43] income,[12,34] social support,[12,13,30,35] and positive and negative enhancing factors for maternal distress.[13,30,31,37,38,40,42–44] Studies have addressed different constructs of maternal distress like antenatal depression,[12,30,32–35,39,41] childbirth related fear,[13,31,42,43] anxiety,[32,36,37,40] and antenatal stress.[37,38,44] This present study maps all possible factors that influence maternal distress and approaches maternal distress as a multi-dimensional concept that includes different psychological symptoms and constructs.

For the purpose of this study we want to examine the occurrence of maternal distress in a population of Dutch women with healthy pregnancies and to identify the explicit factors among this population that might serve as a proxy for midwives to recognise women during antenatal care who are more vulnerable to experience maternal distress. In order to fulfil this purpose, we sought answers to the following questions:

- What are the levels of maternal distress reported by women with a healthy pregnancy?
- What are the aetiological factors influencing the occurrence of maternal distress among these women?

2. Methods

2.1. Design and sample procedure

We conducted a cross-sectional study including a sample of Dutch-speaking pregnant women with uncomplicated pregnancies during any trimester of pregnancy, receiving midwife-led primary care. We included women who were pregnant with a singleton infant and who did not require obstetric-led care as a result of existing or likely complications. Women in secondary and tertiary care were excluded.

The 140 midwife-led primary care practices that offer placements for the students of the Faculty of Midwifery Education & Studies, Maastricht were approached and informed about the content of the study. 31 midwifery practices agreed to recruit a minimum of 30 pregnant women during a routine antenatal appointment between 3 and 28 September 2012. All women in their caseload that attended the clinics during this period were invited to participate. Explanation of the study was also provided via a poster at the recruiting practices. 950 women expressed interest in the study. They were given additional information by telephone and were invited to fill out a questionnaire. Pregnant women chose suitable times for these telephone calls. 766 women agreed verbally to participate and received a consent form by post including a stamped return envelope. 540 women signed and returned the consent form and, depending on the woman's preference, subsequently received a digital or paper questionnaire or a telephone interview done by a student midwife. After two weeks a reminder was sent by mail or email. To raise the response rate, participants could opt to take part in a raffle of mother and baby skincare gift packages.

Data were collected between 10 September and 6 November 2012. The research ethics committee METC-Atrium-Orbis-Zuyd, reviewed and approved the research protocol and confirmed that ethical approval was not necessary according to Dutch guidelines.[45]

2.2. Measures

2.2.1. Maternal distress

We approached maternal distress as a multi-dimensional concept, indicated by symptoms of different psychological constructs identified by measurement instruments with established cut-off points. We therefore chose to sum different individual measures, to provide a more complete and clear picture.[46] Compiling scores of different measurement instruments measured at the same time provides more stable data.[46] In this study we used Dutch versions of the *Edinburgh Depression* Scale,[47] *State- Trait Anxiety* Inventory,[48] and the *Pregnancy-Related Anxiety Questionnaire*.[49]

2.2.2. Edinburgh depression scale (EDS)

We used the EDS (α = .78), a 10-item questionnaire developed to screen for the likelihood of antenatal depression.[50] The Dutch EDS has a similar standardized Cronbach's alpha of α = .82.[47] We asked participants to reflect on their feelings and thoughts of the last seven days. Responses are scored 0, 1, 2 or 3 in seriousness of symptoms. The total score ranges from 0 to 30. In this study we measured depression using a validated cut-off score of 10 or more for women in the first trimester and 11 or more for women in the

second and third trimester. Cut-off scores were based on a Dutch validation study of the EDS among pregnant women in the Netherlands. These cut-off scores appear adequate and yield sensitivity, specificity and positive predictive value per trimester.[51]

2.2.3. State-Trait anxiety inventory (STAI)

To identify feelings of anxiety we employed the Trait scale (α = .89) of the STAI.[52] The Dutch STAI has a similar standardized Cronbach's alpha of α = .91.[48] Trait-anxiety is viewed as proneness to anxiety, a relatively stable personality characteristic. The Trait scale shows high concurrent validity in the pregnant validation sample.[53] We asked participants to describe how they generally felt during the past year. The Trait scale contains 20 items and uses a 4-point rating scale to measure anxiety (*1 'not at all'; 4 'very'*). Scores vary between 20 and 80. Women with scores of 41 and higher are perceived to have high levels of anxiety. This cut-off point has been validated in pregnant Dutch women.[48]

2.2.4. Pregnancy-related anxiety questionnaire (PRAQ)

We measured pregnancy-related anxiety with the 10- item PRAQ.[49] The questionnaire consists of three subscales measuring: fear of giving birth, fear of bearing a physically or mentally handicapped child and concern about their own appearance (α = .78; α = .82; α = .84). The Dutch PRAQ has similar standardized Cronbach's alphas of α = .81, .87, .80 respectively.[54] The PRAQ uses a 5-point rating scale to measure fear and worries (*1 'not at all'; 5 'very'*). We adapted question 8 *"I am scared of labour and birth because I have never experienced this"* for multiparous women by putting 'never' between brackets. We asked women to choose the most appropriate answer about feelings during their current pregnancy. Scores vary between 10 and 50. Based on an earlier Dutch study[8] we used the 90th percentile of the PRAQ total scores to identify women scoring high on pregnancy-related anxiety. The PRAQ total scores show predictive validity.[54]

2.2.5. A multi-dimensional approach

To justify our multi-dimensional approach we measured the degree of relationship between the anxiety (STAI), depression (EDS) and pregnancy-related anxiety (PRAQ) scores with Pearson's correlation coefficient (one-tailed): Anxiety and depression r = .743, p = <.001; anxiety and pregnancy-related anxiety r = .432, p = <.001; depression and pregnancy-related anxiety r = .361, p = <.001. We subsequently did three preliminary separate multiple linear regression analyses with anxiety, depression and pregnancy-related anxiety as dependent variables respectively. We used ten coping styles (described below) as independent variables. Each separate analysis showed the same significant independent variables confirming our multi-dimensional approach. We summed the STAI, EDS and PRAQ scores and used this score as our dependent variable, defining it as maternal distress.

2.3. Factors related to maternal distress

To map the factors related to maternal distress, we examined the literature for factors related to the prevalence of depression, anxiety, (di)stress and childbirth related fear during pregnancy. Our focus was on studies including women with healthy pregnancies and studies including samples with similar demographic characteristics as Dutch pregnant women.[23,55–57] Studies were eligible if they examined any construct belonging to the spectrum of maternal distress (e.g. *depression, anxiety*). To guide this review of the literature we used the PRECEDE-PROCEED planning model.[58,59] This eight-phase model for the development of health promotion interventions offers a framework to analyse health factors related to the prevalence of maternal distress. The first component of the model (*PRECEDE, phase* 1–4) focuses on the diagnostic and needs assessment. The second component (*PROCEED, phase* 5–8) includes implementation and evaluation of the intervention.

We focussed on phase 3 of the PRECEDE component: Aetiological assessment of maternal distress (personal characteristics, history, and personal circumstances, behavioural and environmental factors).

Our literature review showed several factors that make women with healthy pregnancies susceptible to the occurrence of maternal distress (Table 1). Items in the questionnaire were developed from factors identified in PRECEDE phase 3. We phrased *'history of psychological problems'* as 'suffering from (un)diagnosed complaints and symptoms of depression, anxiety, stress, and burnout'. *'Family with (history of) psychological problems'* was defined as 'mother or sister(s) with (a history of) psychological problems.[60] *'Somatization'* was perceived as 'physical complaints with a psychological origin'.[4] *'Rapport'* with the midwife was phrased as 'non-judgemental attitude of midwife, the midwife's interest in, attention for and listening to the woman'.[42,44]

To measure the behavioural factor *coping style* that emerged from PRECEDE phase 3, we used the adapted version of the *Coping Operations Preference Enquiry-Easy* (*COPE-Easy*).[61] The COPE-Easy has been used in Dutch populations to measure health-related quality of life in relation to coping with life events[62,63] and consists of 32 questions incorporating 15 distinct coping strategies. These strategies are grouped into three main coping styles: active problem focused coping, avoidant coping, and seeking social support (α = .85; α = .66; α = .80). The COPE-Easy also includes subscales measuring four different coping styles: use of medication, smoking and drinking; seeking support in religion; use of humour and acceptance of the situation. We asked participants to think of a personal difficult event that had occurred during the past year (including pregnancy) and how they had coped with that situation. The COPE-Easy uses a 4-point rating scale to measure coping (*1 'not at all'; 4 'very'*). Scores range between 32 and 128,

Table 1
Factors related to the occurrence of maternal distress according to PRECEDE phase 3 among women with a healthy pregnancy.

PRECEDE phase 3	Factors related to occurrence of maternal distress
Aetiological assessment	
Personal characteristics	• Maternal young(er) age[30]
	• Increased number of children[31,32,39]
Personal history	• History of psychological problems[13,32–35]
	• History of psychological problems in a woman's family[12,33]
	• History of miscarriage(s)[20,32,36,37]
	• Life events one year prior to or during pregnancy[12,30,38]
	• Negative previous birth experience[13,30,31,37,38,42]
Personal circumstances	• Having young children[30,31]
	• Being single[30,32,35]
	• Language other than the country of habituation[30,32]
	• Working status[30]
	• Low(er) level of income[12,34]
	• Experiencing domestic violence[33,34]
	• Experiencing daily stressors[33,39]
	• High pre-pregnancy weight[32]
	• Negative feelings towards forthcoming birth[31,32,39,40,43]
	• Knowledge of maternal distress[43]
Behavioural factors	• Negative coping styles[2,12,13,38–40,43]
Environmental factors	• Limited/no existing (social/partner) support mechanism(s)[12,13,30,35]
	• Unsupportive midwife[43,44]
	• Unavailable/limited (peer) networks[13,30,34,43,44]
	• Rapport with midwife[42,44]

with a higher score indicating more use of that specific coping strategy. Coping behaviour styles that were not included in the COPE-Easy but had emerged from the literature such as self-disclosure,[13,39,43] somatization[38] and help seeking,[43] were operationalised in our questionnaire.

A 7-point Likert scale (1–7) was used for items other than those from existing instruments, with the extremes labelled in a positive direction 'completely disagree' – 'completely agree'. Items concerning feelings towards forthcoming birth were in the opposite direction, thus the negative experiences had the highest scores. To ensure validity, the questionnaire was pre-tested by a random sample of pregnant women, not participating in the study ($n = 7$) using cognitive interviewing.[64] They applied the following criteria: (i) the focus of items, (ii) comprehensibility, and (iii) time to complete. Pre-testing resulted in the rephrasing of ambiguous and poorly worded questions. The questionnaire took 15 min (range 10–20 min) to complete. The questionnaire is available in Dutch upon request from the first author.

2.4. Analysis

Sample size calculation with statistical significance set at $p = .05$ (95% CI) showed that we required a minimum of 383 participants in order to make inferences about pregnant women receiving midwife-led care from the sample. With an expected response rate of 40%, 920 respondents were invited to participate. To enter the aetiological factors ($n = 30$) that emerged from the literature in a multiple linear regression analysis, we needed a minimum sample of 300 participants.[65]

We calculated descriptive statistics for the personal characteristics, personal history and personal circumstances. Crude data were used for descriptive analysis. When fewer than 10% of the values for an item were missing, missing values were imputed with sample means. Mean sum scores were calculated for items belonging to the same psychological construct and for items belonging to different coping styles. Normality of distribution was confirmed using visual interpretation of histograms and Q–Q plots. We calculated Cronbach's alpha (α) to measure internal consistency of the existing questionnaire items and in each case the results were acceptable, $\alpha > .60$.[65]

Multiple linear regression analysis was used to examine the relationship between the dependent variable (maternal distress) and the multiple independent variables.[65] Maternal distress was the summed score of the total of the EDS, STAI and PRAQ scores. The aetiological independent variables are shown in Table 4. Data entry and analysis were performed using the Statistical Package for the Social Sciences (SPSS) version 19.0.

3. Results

540 women received a questionnaire; 418 were digitally distributed, 117 were distributed by mail and 5 women opted for a telephone questionnaire. The response rate of the women who consented was 88% ($n = 474$). Sixteen questionnaires were excluded (12 women had given birth and 4 women had incorrect due dates), which left 458 (85%) questionnaires for our analyses.

3.1. Characteristics of the respondents

The mean age of the respondents was 31 years. The mean gestational period was 28 weeks: 17 women (3.7%) were in the first trimester of pregnancy, 177 (38.6%) in the second trimester and 264 (57.6%) in the third trimester of pregnancy. Half of the women (48.3%) were nulliparous women and half (51.7%) were multiparous women. A large majority of the women (436, 95.2%) were born in the Netherlands. A relatively large number of women (26.2%) had a history of personal psychological problems (see Table 2).

3.2. Maternal distress

More than 20 percent of the women in our sample showed heightened scores on one or more of the EDS, STAI or PRAQ (Table 3).

3.3. Multiple linear regression analyses

Multiple linear regression analysis was performed with maternal distress as the dependent variable. Analysis shows (in a descending order of strength of association) that a (family) history of psychological problems, having young children, daily stressors, negative feelings towards the forthcoming birth, avoidant coping, and somatisation, have a significant positive relationship with the occurrence of maternal distress. Self-disclosure and acceptance of the situation have a significant negative relationship with the occurrence of maternal distress.

4. Discussion

Our study showed that more than twenty percent of the participants had heightened maternal distress as expressed by symptoms of depression, trait anxiety and/or pregnancy-related anxiety. Trait anxiety was most common with the highest average score followed by successively lower scores for pregnancy-related anxiety (which was subdivided in fear of giving birth, fear of bearing a physically or mentally handicapped child, and concerns about own appearance), and by depressive symptoms.

The amount of variation in maternal distress that is explained by the regression model was high ($R^2 = .629$). The variables most clearly associated with maternal distress were a personal and family history of psychological problems and having young children. The more positive the forthcoming birth was anticipated, the more the occurrence of maternal distress decreased. Self-disclosure and acceptance of the situation were positive coping styles, while avoidance of the situation and somatisation were negative coping styles for maternal distress.

The overall levels of depression and anxiety in our study were similar to those found in other Dutch studies with low risk women of Dutch ethnicity, measured at all trimesters of pregnancy.[51,66] We chose the 90th percentile as cut off score for heightened levels of pregnancy-related anxiety. This percentile captures very high scores but omits the moderate and high scores.[67] This reduces the possibility of false positive reports of maternal distress, but makes likely an underreport of pregnancy-related anxiety and thus an underreport of maternal distress. Our study showed a higher number of women with a personal history of psychological problems compared to other studies among Dutch women with healthy pregnancies.[5,18] The number of women with a family history of psychological problems is similar to other studies.[18] Our higher number of participants with a personal history of psychological problems could be explained by the fact that we enquired about psychological problems in general terms and not necessarily for diagnosed conditions. We asked women if they had suffered from psychological problems, leaving room for participants to report subjective problems.

Having negative feelings about the forthcoming birth was related to the occurrence of maternal distress of the participants. It is plausible that a previous birth experience can play a role. The literature shows that one in 10 women in the Netherlands has a traumatic birth experience,[69] and one in 6 women has a negative recall of her birth experience.[70] Addressing feelings with regard to a forthcoming birth during

Table 2
Characteristics of participants ($N = 458$).

Characteristic	Mean (SD ±, range)	*N* (%)	Dutch population
Age	30.62 (±3.9, 21–45)		30.6[23]
Gestational period in weeks	28.27 (±8.28, 9–43)		
No children		221 (48.3)	44.9%[23]
1 child		176 (38.4)	35.9%[23]
2 children		50 (10.9)	19.2% (P2 +)[23]
3 children		9 (2)	
4 children		2 (.4)	
History of miscarriage(s)		97 (21.3)	
Life events in year prior to/during pregnancy		126 (27.7)	
Current domestic violence		17 (3.7)	
With partner		454 (99.1)	90%[56]
Single		4 (.9)	10%[56]
Respondent born in the Netherlands		436 (95.2)	74%[23]
Respondent born in other Western country[56]		12 (2.6)	4.9%[23]
Respondent born in non-Western country[56]		10 (2.2)	21.1%[23]
Mother respondent born in the Netherlands		431 (94.1)	
Mother respondent born in other Western country[56]		14 (3.1)	
Mother respondent born in non-Western country[56]		13 (2.8)	
Father respondent born in the Netherlands		430 (93.9)	
Father respondent born in other Western country[56]		14 (3.1)	
Father respondent born in non-Western country[56]		14 (3.1)	
Income above average (€33.000/annum)		342 (75.2)	62%[57]
Income below average (€33.000/annum)		112 (24.6)	
Working (paid job)		405 (89)	
Low level of education		30 (7)	
Medium level of education		156 (34.3)	
High level of education		269 (59.1)	
Weight prior to pregnancy	69.48 (± 13.24, 41–125)		
Smoking during pregnancy	2.13 sig./day (± 8.67)	86 (18.9)	
Drinking during pregnancy	.01 units/week (±.08)	2 (.4)	
Drugs during pregnancy	None	None	
History of psychological problems		119 (26.2)	
History of treatment for psychological problems		78 (17.1)	
Current medication use (prescribed) for psychological problems		7 (1.5)	
Family with (history of) psychological problems		59 (13)	
Own history of psychological problems + family with (history of) psychological problems		26 (5.7)	

antenatal care ultimately belong to the midwife's scope of practice. Addressing such feelings reflects the midwife's unique supportive role with regard to the process and emotions concerning labour and birth. This enhances the central concepts of the midwife's role: exchanging information, developing trust and interpersonal and supportive interaction.

Having children was a significant predictor for maternal distress. Women with multiple roles; being a mother, a partner, an employee are found to be more vulnerable for maternal distress as this is related to more stressors in a woman's life.[68] This was consistent with the characteristics of our sample and the significant variable daily stressors for maternal distress. Avoidance,[71,72] and somatisation[4] are recognised to be associated with heightened levels of maternal distress; this was consistent with our findings. Women in our study adopted different coping styles. Education and income may increase the number and kind of coping options,[70] which could have been relevant to our sample containing on average a high number of well-educated and rather affluent women.

Table 3
Maternal distress measured by depression (EDS), trait anxiety (STAI) and pregnancy & birth related anxiety (PRAQ) ($N = 458$).

Measure	Mean (SD ±, range)	*N* (%)
EDS (range 0–30)	4.69 (±3.20, 0–23)	
EDS score 10/11 or more		29 (6.3)
STAI (range 20–80)	28.8 (±9.33, 20–58)	
STAI score 41 or more		66 (14.4)
PRAQ total (range 10–50)	19.6 (±7.45, 10–46)	
PRAQ 1 (fear of giving birth) (range 3–15)	6.03 (±3.18, 3–15)	
PRAQ 2 (fear of bearing a handicapped child) (range 4–20)	8.73 (±3.97, 4–20)	
PRAQ 3 (concern own appearance) (range 3–15)	5.37 (±3.14, 3–15)	
PRAQ total scores >90th percentile		54 (11.8)
Maternal distress: women with heightened scores on one or more measure (0–80)[a]	27.59 (±8.9, 0–58)	102 (21.8)

[a] EDS ≥ 10/11 or STAI ≥ 41 or PRAQ > 90th percentile.

A strength of our study is incorporating all possible predicting factors for maternal distress, as this has never been studied before. Most studies focussed on risk factors for maternal distress concerning different aspects or fragments of a woman's personal history or her daily circumstances.[12,13,30–37] We reviewed the literature for influencing factors with regard to maternal distress and systematically categorised these in order to analyse them. To the best of our knowledge there are no studies that have used a multi-dimensional approach with regard to maternal distress. Our study showed that a woman can have heightened scores on more than one measure and that depression and the different constructs of anxiety are significantly correlated. A one-dimensional focus on a single psychological construct may overestimate its importance within the spectrum of maternal distress.[74] Asking women one or two single questions about how they feel, rather than administering questionnaires to assess different constructs, may have more clinical relevance.[46]

Our study does have limitations. Our sample contained mostly well-educated women with on average a good level of income. Most women were in a relationship and were born in the Netherlands. These characteristics do not perfectly reflect those

Table 4
Multiple linear regression analysis of aetiological factors of maternal distress.

Factors	*B*	*t*	*p*-value	95% CI for B	
				Lower Bound	Upper Bound
(Constant)	.759	3.129	.002	5.114	22.404
Personal characteristics					
Age	−.051	−.745	.457	−.184	.083
Number of children	−.028	−.506	.613	−.136	.080
Personal history					
(Family) history of psychological problems	1.071	3.455	.001*	.462	1.681
Life events during the last year	−.346	−.577	.564	−1.527	.834
Having young children	2.998	3.429	.001*	1.279	4.717
History of miscarriage(s)	1.081	1.640	.102	−.215	2.376
Previous birth experience	.121	1.156	.248	−.084	.326
Personal circumstances					
With partner	4.314	.770	.442	−6.697	15.325
Currently experiencing domestic violence	.976	.469	.640	−3.117	5.069
Ethnicity other than Dutch	−1.834	−1.538	.125	−4.178	.510
Working (paid job)	.629	.742	.459	−1.038	2.297
Level of income	.314	.496	.620	−.930	1.557
Weight prior to pregnancy	−.030	−1.507	.132	−.069	.009
Daily stressors	1.304	12.152	000*	1.093	1.515
Negative feelings towards forthcoming birth	.636	9.352	.000*	.502	.770
Knowledge maternal distress	−.101	−.723	.470	−.377	.174
Behaviour					
Self-disclosure	−.863	−2.920	.004*	−1.445	−.282
Problem (active) focused coping	.033	.100	.920	−.607	.672
Emotional (social support) focused coping	.071	.262	.793	−.463	.606
Avoidant coping	1.047	3.569	.000*	.470	1.623
(Increased) substance usage	.383	.876	.381	−.476	1.243
Seeking support in religion	−.173	−1.095	.274	−.483	.137
Use of humour	−.035	−.184	.854	−.404	.334
Acceptance of the situation	−.542	−2.679	.008*	−.940	−.144
Somatisation	.484	2.935	.004*	.160	.809
Help seeking	−.268	−1.108	.268	−.743	.207
Environmental factors					
Existing (social/partner) support mechanism(s)	.015	.268	.789	−.098	.129
Availability of supportive midwife	110	1.511	.132	−.033	.254
Availability of (peer) network	.016	.538	.591	−.043	.075
Rapport midwife	.012	.160	.873	−.138	−.162

* $p = <.05$ R^2 of all factors .629.

of the average Dutch pregnant population.[23,55–57] Generalisability of our findings to a broader population must be done carefully. Recruitment of our participants occurred in primary care midwifery practices in the Netherlands. Because of the selection within primary care midwifery practices, our findings cannot necessarily be generalised to women in obstetric settings as evidence suggests that women in obstetric care have higher levels of maternal distress.[19] Selection bias could have occurred in our recruitment of midwifery practices and participants. We approached 140 midwife-led practices for the study, and 31 practices agreed to participate. Practices that agreed to participate were perhaps more interested in maternal distress than practices that did not participate. It is known that the more interested midwives are in maternal distress, the more they engage in identifying and supporting women with maternal distress.[26] As women were approached regarding participation in the study by their own midwives, selection bias could have occurred. It is unknown exactly how many women were approached and if midwives consciously and categorically asked certain women to participate rather than others. Women's decision to participate in the study could have been triggered by self-recognition of maternal distress. Self-selection could have led to a higher prevalence of maternal distress but could not have affected the influencing factors for maternal distress. We have used self-reported screening instruments to examine the levels of maternal distress. We did not use diagnostic instruments for maternal distress, which implies that we identified only those women who are *more likely* to develop maternal distress but not necessarily *suffer* from maternal distress.[75,76] The number of women in our study *at risk* for maternal distress, do not necessarily represent women *diagnosed* with maternal distress.[73,74] Therefore our number of women with maternal distress could be higher, including women with physiological distress associated with adjustment to pregnancy and women with pathological distress with clinical relevance.[73] However, our heightened levels of maternal distress are within the range of global findings.[18]

4.1. Recommendations for research

We chose to adopt a multi-dimensional approach, compiling the scores of most of the known psychological constructs during pregnancy: depression, anxiety and pregnancy-related anxiety. Several researchers have called for multi-dimensional measures of maternal distress in light of the increasing evidence that women experiencing maternal distress report symptoms belonging to more than one construct, and that different constructs correlate.[6,73,77–79] Future research should build on our work examining and using validated instruments measuring different aspects of maternal distress. The EDS, for example, is validated to measure depression and anxiety simultaneously.[79] The 4 Dimensional Symptom Questionnaire for pregnancy (4DSQ) has been validated among Dutch pregnant healthy women to measure distress, anxiety, somatisation and depression at the same time,[4] but was not available at the time of our study. Our study used a

cross-sectional design and reliance on one source of information. The next step in the analysis of the factors that generate maternal distress is the use of a longitudinal design.

4.2. Recommendations for practice

The findings of our study highlight the need for midwives to familiarise themselves with women and their personal history and circumstances. Midwives need to reconsider that these issues impact women's emotional wellbeing during pregnancy.[25] In order to provide adequate care to vulnerable women, clinical practice guidelines should incorporate the thoughtful identification of women who are more vulnerable to present with or develop maternal distress during pregnancy.[12] In order to reduce maternal distress, feelings about the forthcoming birth require attention and should be discussed during care. Because of their specific knowledge, expertise, engagement with, and support for, the emotional health of women during pregnancy and birth. midwives are uniquely qualified to initiate those discussions.

Our study included women that are assumed to be in a fairly stable and comfortable position in life, based on having a relationship, a good level of education and income and a having a healthy pregnancy. However, evidence from Confidential Enquiry into Maternal and Child Health[80] illustrates that it is in particular this group of women that seems to be a very vulnerable group to develop maternal distress. As these 'everyday women' are part of midwives' caseloads, it is important that midwives are aware that vulnerable women are among those populations where least expected.

5. Conclusion

More than twenty percent of pregnant women with a healthy pregnancy showed heightened maternal distress scores. Maternal distress was predominantly associated with a variety of coping styles, a woman's personal history and her personal circumstances. We recommend that midwives use these factors in their assessment of each woman and remain aware throughout antenatal care that these issues are related to the occurrence or development of maternal distress. Midwives need to be aware of the importance of their role with regard to pregnant women and maternal distress.

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