

## **Lifetime sexual violence and childbirth expectations – A Norwegian population-based cohort study.**

**Objective** This study aimed to explore the association between lifetime sexual violence and expectations about childbirth.

**Design** Norwegian population-based cohort study.

**Setting** Women presenting for routine ultrasound examinations were recruited to the Norwegian Mother and Child Cohort Study between 1999 and 2008.

**Population** 78,660 pregnant women.

**Methods** Sexual violence and expectations about childbirth were self-reported during pregnancy using postal questionnaires. Risk estimations were performed using multivariable logistic regression analysis and stratified by parity.

**Main Outcome Measures** Fear of childbirth, the thoughts about pain relief, worries about the baby's health and looking forward to the arrival of the baby.

**Findings** Of 78,660 women, 18.4% reported a history of sexual violence and 0.9% were exposed to sexual violence within the last 12 months, including during the current pregnancy. We found that nulliparous women who reported previous or recent sexual violence had a decrease in the odds of looking forward to the arrival of the baby with an AOR of 0.8 (95% CI 0.7-0.9) and 0.4 (95% CI 0.3-0.6), respectively, compared to non-abused women. The same pattern was observed among multiparous women and they were more likely to report worries about the baby's health. Severe sexual violence (rape) was associated with concerns about childbirth, especially for nulliparous women that were more likely to express fear of birth, a hope for a pain-free birth, a desire for caesarean section and worries about the baby's health than non-exposed women.

**Conclusions** Women with a lifetime exposure to sexual violence, both past experiences and within the last 12 months, were less likely to look forward to the arrival of the baby than non-exposed women, and they were more likely to worry about the baby's health. Women with experiences of severe sexual violence (rape) had more concerns about childbirth than women without this experience. This finding shows that exploring women's attitudes toward childbirth may work as an approach when examining exposure to violence.

**Key words** Sexual violence, pregnancy, fear of childbirth, expectations, MoBa

### **Highlights:**

- Women exposed to lifetime sexual violence were less likely to look forward to the arrival of the baby than non-exposed women.
- Exposed women were also more likely to worry about the baby's health.
- Both nulli- and multiparous women who had experienced severe sexual violence (rape) were more likely to express worries towards childbirth, like fear of birth, a wish for a caesarean section or a wish for a pain-free birth than women without this experience.

### **Introduction**

Sexual violence against women is a major public health problem that can cause physical and psychological harm to women and lead to pregnancy complications (Boy and Salihu, 2004; Campbell, 2002; Ellsberg et al., 2008; Leserman, 2005; Sarkar, 2008), which can also affect parenting (Garcia-Moreno et al., 2013) and the well-being of the children (Rivara et al.,

2007). Sexual violence is highly prevalent, and the World Health Organization (WHO) states that 35% of women worldwide have been exposed to physical and/or sexual violence during their lifetime (Garcia-Moreno et al., 2013). Studies within this field often include women that have been exposed to different types of abuse, both as a child and adult and co-occurrence of violence and re-victimisation are common (Ellsberg et al., 2008). This makes it challenging to investigate consequences of all type of violence, including sexual violence (Garcia-Moreno et al., 2013, Ellsberg et al., 2008). Women are also vulnerable to violence during pregnancy and the prevalence of physical and/or sexual violence during pregnancy ranges from 3.4 to 11% in high-income countries (Campbell et al., 2004). Given this high prevalence, it is likely that a considerable proportion of pregnant woman have been exposed to sexual violence at some point during their lifetime.

Pregnancy is a period when past and ongoing violent experiences can affect both the woman's maternity care experiences and outcome (Seng et al., 2010). It is known that a history of sexual violence can interfere with the bonding process and have a profound effect on a woman's ability to relate to her baby and affect the quality of parenting (Buist, 1998; Lieberman et al., 2005). Memories of violence may for some women resurface during pregnancy or it may be the first time they are aware of previous exposure to sexual violence (Courtois and Courtois, 1992; Leeners et al., 2013). Studies show that women rarely disclose past or ongoing abuse (E. Montgomery et al., 2015; Thoresen, 2014), and screening for violence during pregnancy has been discussed as an action to increase disclosure in order to prevent adverse consequences and help women who live in an abusive relationship (McFarlane et al., 1992; WHO, 2013). The WHO recommends screening in settings such as antenatal care when sufficient guidelines exist and accurate help may be provided for exposed women (WHO, 2013). Women do not necessarily answer direct questions about violence, and

open communication and a genuine interest in women as individuals are required (E. Montgomery et al., 2015). This genuine concern should include interest in women's thoughts and hopes about childbirth. It is likely that abused women have unmet mental and psychological needs that will affect their expectations about birth. Negative feelings towards childbirth are considered important for the outcome, both during birth and postpartum (Waldenstrom et al., 2006).

Studies that have examined the effect of lifetime sexual violence on women's expectations of childbirth are few, except for studies on the fear of birth in which studies have shown an association with sexual violence (Heimstad et al., 2006; Lukasse et al., 2010; Schroll et al., 2011). The main exposures have traditionally been childhood abuse (Heimstad et al., 2006; Lukasse et al., 2006) or both physical and sexual violence (Schroll et al., 2011). Among several questions in the Norwegian Mother and Child Cohort Study (MoBa), pregnant women were asked specific questions about exposure to sexual violence and also a set of questions about their expectations about childbirth. We hypothesised that women who were exposed to sexual violence would express more worries towards childbirth than non-exposed. The aim of this study was to investigate whether women with a lifetime exposure to sexual violence have different thoughts regarding childbirth, pain relief and the arrival of the baby than non-exposed women.

## **Methods**

Our study examined this question in the Norwegian Mother and Child Cohort Study (MoBa), a prospective population-based pregnancy cohort study conducted by the Norwegian Institute of Public Health (Magnus et al., 2006). The study was conceptualised in the 1990s, and the

main aim of the study was to find causes of disease (Magnus et al., 2006). The MoBa study is a large epidemiological study designed to investigate many correlations and a large number of research questions have been and still are examined (Magnus et al., 2006). Participants were recruited in Norway from 1999-2008, and 40.6% of the invited women consented to participate. The participants in this study received a postal invitation with their routine ultrasound appointment. The women answered extensive questionnaires regarding demographic factors, general health, reproductive history and maternal health during pregnancy. We used questionnaire 1 (Q1), completed at approximately gestational week 17, and questionnaire 3 (Q3), completed at week 30. Data from the MoBa study were linked with data from the Medical Birth Registry of Norway (MBRN), a registry that keeps record of all deliveries in Norway with data based on a standardised form completed by midwives shortly after delivery (Irgens, 2000). This study is based on version VI of the quality-assured data files released for research in 2011. The MoBa study is described in detail elsewhere (Magnus et al., 2006), and additional information about the study can be found at the following web address: <http://www.fhi.no/studier/den-norske-mor-og-barn-undersokelsen>.

Figure 1 describes the inclusion and exclusion criteria and process for this study. The study sample consisted of 78,660 women.

### *Exposure*

The exposure variable was collected from Q1. In this questionnaire, the women were asked if they had ever been pressured or forced into sexual activities. The answer options included the following: 1) No, never; 2) Yes, pressured; 3) Yes, forced with violence; and 4) Raped. A positive answer was defined as having experienced sexual violence. The answer options were recoded into mild, moderate and severe sexual violence. Women with more than one positive

answer were classified according to the most severe level reported. We used this terminology because it corresponds to other studies that have used validated instruments to study the prevalence of violence (Garcia-Moreno et al., 2013) and the Norwegian wording in the MoBa questionnaire suggests an increasing severity in the answer options that we wanted to examine. We recognise that all three answer options may be considered severe by the person who experienced the violence. Women could also indicate the timing of the violence for the following time periods: 1) during this pregnancy; 2) during the six months prior to this pregnancy; or 3) earlier. Approximately 1700 women who responded to the first version of Q1 had the option to answer ‘earlier’ and ‘during the last 12 months’. Because of this option, we created the variables ‘previous’ and ‘recent sexual violence’, with the latter including sexual violence that occurred during the last 12 months, including the current pregnancy. A study unit in MoBa is a pregnancy, and a study unit in our study is a woman; therefore, we excluded pregnancies in women who participated more than once. This ensured that the exposure was counted only once for each woman.

### *Outcomes*

The outcomes were taken from Q3 in which women were asked to evaluate the following questions:

I am really dreading giving birth
If I could choose I would prefer to have a caesarean section (CS)
I want to have enough medication so the birth will be painless
I will have an epidural regardless of what the midwife says
I worry all the time that the baby will not be healthy or normal
I am really looking forward to the baby coming

The answer options were on a six-point scale from “agree completely” to “disagree completely”. “Agree completely” and “agree” were classified as supportive of the statement in the questions. We have called agreement with the statement “I am really dreading giving birth” fear of childbirth.

### *Covariates*

Maternal age, parity, socio-economic status and civil status were considered a priori as possible confounding factors and were adjusted for in our analysis. The majority of adjusting variables were taken from the MoBa study. From Q1, age was categorised into 5 groups: younger than 19 years, 20–25 years, 26–31 years, 32–37 years or 38 years and older. As a proxy for socio-economic status, we used the woman’s education in years (categorised into 4 groups): primary (<12 years), secondary (12 years), higher  $\leq 4$  years (13–16 years and) and higher >4 years ( $\geq 17$  years). Parity was dichotomised into nulli- and multiparous women. We also adjusted for mental distress because it is considered to be associated with the exposure (Devries et al., 2013) and it may affect a woman’s feelings towards childbirth. Mental distress was measured using 5 items (SCL-5) from the Hopkins symptoms checklist (SCL-25) with a cut-off at  $\geq 2.0$  points, as suggested by Strand (Strand et al., 2003) and obtained from Q3. The short-version is shown to correlate with the original instrument (Strand et al., 2003; Tams and Moum, 1993) that has proved to have satisfactory validity as a measure of psychological distress (Glass et al., 1978). In addition, we examined the effect of pre-pregnancy risk factors because this would be a known factor throughout the pregnancy that could cause concern. Pre-pregnancy risk factors were taken from the MBRN and consisted of diabetes, epilepsy and pre-pregnancy hypertension. We also examined the effect of a previous CS among multiparous women. If a woman had a previous CS, it was recorded in the MBRN. We did

not have the possibility to adjust for prior forceps or vacuum extraction because this is not recorded in MoBa or MBRN.

### *Statistical analysis*

Frequency analysis was used to quantify the proportion of the different levels of sexual violence and the prevalence of the different outcomes. Cross-tabulations and Pearson's chi-square tests were used to study percentages and assess differences in characteristics for the different severities of sexual violence. The associations between exposure variables and the outcomes were estimated as crude and adjusted odds ratios (OR) using logistic regression analyses with 95% confidence intervals (CI). All analyses were adjusted for maternal age, education, civil status, pre-pregnancy risk factors and mental distress. We stratified all the regression analyses for parity because it is likely that a prior birth influences the expectations a woman has for the upcoming birth. When we examined multiparous women's wish for a CS, we controlled for a previous CS. When we examined the timing of the sexual violence, we compared women who were exposed to recent sexual violence (within the last 12 months) and those exposed to previous sexual violence to non-abused women.

The prevalence of missing data was generally less than 5%. Because of this prevalence, no imputing methods for missing data were used (Veierød et al., 2012), except for the missing data for the SCL-5 (3.2%), which were replaced by the series mean. The results of the logistic regression analyses remained approximately the same when performed with the complete exclusion of missing data compared with using the imputed missing data for SCL-5. All covariates were initially tested for correlation, and all Pearson's correlation coefficients were below the generally accepted cut-off of  $<0.4$  for use as a covariate in the regression analyses



(Field, 2009). The comparison group for all analyses was women not reporting any sexual violence. All analyses were performed with the statistical package SPSS for WINDOWS (SPSS Inc., Chicago, IL, USA) version 21. P-values <0.05 were considered statistically significant.

#### *Details of ethics approval*

The study was approved by The Regional Committee for Medical Research Ethics 28.03.1996 (Ref.SAFH 95/313 RTL) and by the Norwegian Data Inspectorate. Informed consent was obtained from each MoBa participant upon recruitment.

### **Findings**

The overall prevalence of sexual violence was 18.4% in our study. A total of 694 women (0.9%) were exposed to sexual violence during the last 12 months, including the current pregnancy. Among the 78 660 women enrolled, 12% reported a history of mild sexual violence, 2.8% moderate and 3.6% severe. Women with a history of sexual violence were significantly younger, more often single and they were more likely to have a primary school education. Additionally, these women were more likely to report mental distress.

Characteristics and different outcomes are presented in Table 1 according to the severity of the violence. A dose response relationship is shown, as the prevalence of the different outcomes increased with the severity of the violence. For example, a higher proportion of women who were exposed to severe sexual violence reported fear of childbirth compared to those who were exposed to mild sexual violence (Table 1). The same pattern is observed with previous and recent exposure to sexual violence, the prevalence of women reporting the different outcomes is in general higher among women exposed to previous sexual violence

compared to non-exposed and higher among those exposed to recent sexual violence compared to non-exposed and those exposed to previous sexual violence (table 2).

We examined the timing of the violence, and we looked at previous sexual violence and recent sexual violence compared to non-exposed women. We found that nulliparous women, regardless of when the sexual violence had occurred, had a higher OR of wanting a CS than did non-exposed women and they were more likely to report fear of childbirth. More nulliparous women exposed to previous sexual violence also reported worries about the baby's health than did the non-abused women. There were no differences for the other thoughts and wishes about childbirth except a decrease in the odds of looking forward to the arrival of the baby for both previous and recent sexual violence with 20% and 60%, respectively (Table 2). Multiparous women, both those who reported previous and those who reported recent sexual violence, more often reported worries about the baby's health and had a decrease in the odds of looking forward to the arrival of the baby. The decrease was 70% among those who reported recent sexual violence (Table 2).

When we looked at the different levels of severity of the violence, we found that nulliparous women who were exposed to severe sexual violence (rape) more often reported concerns regarding childbirth than did non-exposed women (Table 3). In unadjusted analyses, we observed an approximately two-fold increase in the odds of reporting fear of childbirth, wanting a pain-free birth, wanting an epidural regardless of what the midwife says, the wish for a CS and worries about the baby's health. When we adjusted for age, civil status, education, mental distress and pre-pregnancy risk factors, the ORs were attenuated but still significant for nulliparous women exposed to severe sexual violence. Multiparous women

who were exposed to severe sexual violence expressed a similar pattern regarding concerns toward childbirth as shown among nulliparous women, but the ORs were generally lower (Table 3). The association between severe sexual violence and the fear of childbirth and a wish to have a pain-free birth lost its significance when we controlled for age, civil status, education, mental distress and pre-pregnancy risk factors. For the outcome “a wish for CS”, we additionally controlled for a previous CS among the multiparous women, and the OR remained significant in the adjusted analysis. Multiparous women who reported mild and moderate sexual violence had a decrease in the odds of looking forward to the baby in both unadjusted and adjusted analyses (Table 3).

## **Discussion**

In this study, we found that women with a lifetime exposure to sexual violence, regardless of the timing, were less likely to look forward to the arrival of the baby than non-exposed women. Additionally, they more frequently reported worries about the baby’s health. Furthermore, we found that both nulli- and multiparous women who had experienced severe sexual violence (rape) more often had concerns about childbirth than women without this experience.

We have examined a set of expectations toward childbirth, and among these, the fear of childbirth is the most investigated outcome in connection with sexual violence. Several studies have reported an association between the fear of birth and sexual violence (Heimstad et al., 2006; Lukasse et al., 2010; Schroll et al., 2011). Lukasse et al. showed an association between childhood abuse and the fear of childbirth among nulliparous women in a study of 2365 pregnant women at five obstetrical departments in Norway (Lukasse et al., 2010). A

Danish multicentre study by Schroll et al. found an association between a lifetime experience of sexual violence and fear of birth after delivery in a sample of 2638 obstetrically low-risk nulliparous women (Schroll et al., 2011). Our study supports these findings.

We have found a strong association between sexual violence and whether women looked forward to the arrival of the baby. The odds of looking forward to the baby's arrival decreased when women had been exposed to sexual violence. This trend was observed regardless of parity and timing of the violence. The association was especially strong among those who reported recent sexual abuse with a 60% and 70% decrease in the odds among nulli- and multiparous women, respectively. This finding has, to our knowledge, not previously been described in population-based studies. A previous study (Eide et al., 2010) of 58,139 pregnancies from the MoBa cohort showed an association between childhood abuse and later worries about the baby's health, and this finding is supported by our study. These worries, and especially the fact that women who reported recent sexual violence had a considerable decrease in the odds of looking forward to the arrival of the baby, may have consequences for the transition into motherhood and may affect the bonding process. It is likely that some of these women lived in an abusive relationship when they participated in the MoBa study. It is shown that exposure to violence during pregnancy has a significant impact on women's parenting abilities and can compromise their children's development (Simkin and Klaus, 2004; Taft et al., 2012). Our study does not provide information regarding the perpetrator of the violence, and only 0.9% reported recent sexual violence, which may include sexual violence during the current pregnancy. Few studies have examined sexual violence only among pregnant women, but the studies that report the highest prevalence of violence have measured exposure several times during pregnancy (Campbell et al., 2004). In our study,

sexual violence was assessed at approximate gestational week 17, and events after that have been missed.

There are studies that have found an association between CS and the use of pain relief and sexual violence (Nerum et al., 2012; Van der Hulst et al., 2006). In our previous study, with a sample of 74,058 women from the MoBa cohort, we found an association between both planned and emergency CS and sexual violence (Henriksen et al., 2014). We also found that exposed nulliparous women had epidurals more often than did non-exposed women (Henriksen et al., 2014). In the previous study in which the outcomes were collected from the Medical Birth Register of Norway, 4.9% of the women had a planned CS and 8.6% had an emergency CS. In our current study, a higher percentage of the abused women wished for a CS in gestational week 30. Among women exposed to mild, moderate and severe sexual violence, 5.2, 6.4 and 8.4%, respectively, wished for a CS. Both a wish for a CS and a wish for pain relief can be a coping mechanism for abused women because it may give them a feeling of control. Control is suggested as an important coping mechanism for women who have been exposed to sexual violence (Montgomery, 2013).

### *Strength and limitations*

A major strength in our study was the large sample size that gave robust results and allowed adjustment for confounding factors and other covariates. The validity of the data in the MoBa study has in earlier research been described as sufficient for large-scale epidemiologic studies (Furu et al., 2011; Kvalvik et al., 2012). In addition, selection bias in relation to the exposure is unlikely because the women who consented to participate were not expecting questions on sexual violence. Only 703 women declined to answer the questions on sexual violence in our

sample of nearly 80,000 women. However, we acknowledge some limitations, especially the low response rate. We lack information on the women who did not participate, and selection bias is a cause for concern. Nilsen et al. found that women younger than 25 years, smokers, women living alone and women with two or more previous births were under-represented in the MoBa study (Nilsen et al., 2009). Despite the under-representation of some groups, the study concluded that estimates of exposure-outcome associations were not biased due to self-selection (Nilsen et al., 2009). Another limitation to this study was the lack of a validated instrument for measuring the exposure (information bias). The current recommendation on how to obtain valid data on violence against women is the use of stand-alone specialised surveys (Garcia-Moreno et al., 2013). Violence modules as used in MoBa may achieve a lower disclosure rate. Our prevalence of 18.4% for sexual violence is comparable to other studies (Hilden et al., 2004; Leserman, 2005; Lukasse et al., 2014). If there is underreporting of sexual violence due to information bias or selection bias, it may have caused a misclassification that have probably diminished the associations between sexual violence and the different outcomes in our study.

Because of the study design, with already existing data, we were able to control for a-priory confounding factors and covariates. We decided on maternal age, education (as a proxy for socio-economic status), civil status, pre-pregnancy risk factors and mental distress. Age is considered a true confounding factor (Rothman 2012), Socio-economic factors and civil-status are considered predictors of both sexual violence and adverse pregnancy outcome (Brownridge et al, 2011; Kramer et al., 2000). Mental distress may be on the causal pathway between sexual violence and childbirths expectations, but we chose to control for this because a bi-directional relationship between mental distress and sexual violence is described (Devries et al., 2013). There may be other covariates not accounted for in this material, for example a

previous birth experience that can have an effect on the different outcomes. We have only been able to adjust for a previous CS, not a positive or negative former experience and we have stratified for parity because of this. In addition, there may be other or current life stressors that can cause worries towards childbirth.

Because of the large sample size, small differences will reach statistical significance and the strength of the association varies in our study with AOR from 1.3-1.7 and 0.3-0.7. This has to be taken into consideration when clinical importance is considered. Regardless of this, our prevalence estimates shows that all outcomes are prevalent (Table 1 and 2) and more prevalent among those exposed to violence.

### *Conclusion and Implications*

Women who reported sexual violence in this study had a significant decrease in the odds of looking forward to the arrival of the baby, and they more often expressed concerns about childbirth and the baby's health than women without such experiences. These are new findings from a population-based study that add to the long list of adverse consequences caused by a history of sexual violence. Although women have been reported as open to discuss exposure to sexual violence with health care providers, this is not the usual practice, mainly because clinicians are reluctant to ask about violence (Rodriguez et al., 2001).

Antenatal care, during which women have the opportunity to develop an ongoing relationship with one care provider, for example a midwife, may be a window of opportunity to ask about violence. Women may feel safe enough in this setting to disclose previous or ongoing exposure to violence. Some countries, such as the UK and Norway, recommend asking all

pregnant women about prior and ongoing experiences of violence (NICE 2014; Helsedirektoratet 2014). This is supported by the World Health Organisation (WHO 2013) and a systematic review from O'Riley et.al (O'Riley et.al., 2013). Whether women should be asked about violence in a primary health care setting in general is debated and not recommended in a recent Cochrane review from 2013 (Taft et al., 2013). There is still a lack of evidence on how to appropriate intervene regarding violence (Taft et al.,2034; Jahanfar et al., 2013). A Cochrane review from 2013, that explored interventions for preventing or reducing domestic violence against pregnant women, concluded that there is insufficient evidence of effective interventions, but that a psychological therapy intervention may help reduce violence (Jahanfar et al., 2013).

Examining what women think about childbirth, including fear of birth that is a well-known concept for midwives, but also thoughts about pain relief and how women look forward to the arrival of the baby, may be a good approach to examine violence exposure and may serve as an aid to identify vulnerable women. It is important that health care providers understand the relationship between sexual violence and women's childbirth expectations to be able to respond appropriately when they meet women with a history of sexual violence.

### **Competing interests**

The authors declare that there are no conflicts of interest.

### **References**

Boy, A., Salihu, H. M. 2004. Intimate partner violence and birth outcomes: a systematic review. *Int.J.Fertil.Womens Med.* 49, 159-164.



- Brownridge, D. A., Taillieu, T. L., Tyler, K. A., Tiwari, A., Ko, L. C., Santos, S. C., 2011. Pregnancy and intimate partner violence: risk factors, severity, and health effects. *Violence Against Women*. 17, 858-881.
- Buist, A. 1998. Childhood abuse, postpartum depression and parenting difficulties: a literature review of associations. *Aust N Z J Psychiatry*. 32, 370-378.
- Campbell, J., García-Moreno, C., Sharps, P. 2004. Abuse During Pregnancy in Industrialized and Developing Countries. *Violence Against Women*, 10, 770-789
- Campbell, J. C. 2002. Health consequences of intimate partner violence. *Lancet*, 359, 1331-1336.
- Courtois, C. A., Courtois, R. C. 1992. Pregnancy and childbirth as triggers for abuse memories: implications for care. *Birth*, 19, 222-223.
- Devries, K. M., Mak, J. Y., Bacchus, L. J., Child, J. C., Falder, G., Petzold, M., Watts, C. H. 2013. Intimate partner violence and incident depressive symptoms and suicide attempts: a systematic review of longitudinal studies. *PLoS.Med.* 10, e1001439.
- Eide, J., Hovengen, R., Nordhagen, R. 2010. Childhood abuse and later worries about the baby's health in pregnancy. *Acta Obstet Gynecol Scand*, 89, 1523-1531.
- Ellsberg, M., Jansen, H. A., Heise, L., Watts, C. H., Garcia-Moreno, C. 2008. Intimate partner violence and women's physical and mental health in the WHO multi-country study on women's health and domestic violence: an observational study. *Lancet*. 371, 1165-1172.
- Field, A. 2009. *Discovering statistics using SPSS* SAGE, Los Angeles.
- Furu, K., Karlstad, O., Skurtveit, S., Haberg, S. E., Nafstad, P., London, S. J., Nystad, W. 2011. High validity of mother-reported use of antiasthmatics among children: a comparison with a population-based prescription database. *J.Clin.Epidemiol.*, 64, 878-884.
- Garcia-Moreno, C., Pallitto, C., Devries, K., Stöckl, H., Abrahams, N. 2013. Global and regional estimates of violence against women: prevalence and health effects of intimate partner violence and non-partner sexual violence. Geneva.
- Glass, R. M., Allan, A. T., Uhlenhuth, E. H., Kimball, C. P., Borinstein, D. I., 1978. Psychiatric screening in a medical clinic. An evaluation of a self-report inventory. *Arch Gen Psychiatry*. 35, 1189-1195.
- Heimstad, R., Dahloe, R., Laache, I., Skogvoll, E., Schei, B. 2006. Fear of childbirth and history of abuse: implications for pregnancy and delivery. *Acta Obstet Gynecol Scand*. 85, 435-440.
- Helsedirektoratet 2014. Nasjonal faglig retningslinje for svangerskapsomsorgen – hvordan avdekke vold. Oslo: Helsedirektoratet [Norwegian].
- Henriksen, L., Schei, B., Vangen, S., Lukasse, M. 2014. Sexual violence and mode of delivery: a population-based cohort study. *BJOG*. 121, 1237-1244.
- Hilden, M., Schei, B., Swahnberg, K., Halmesmaki, E., Langhoff-Roos, J., Offerdal, K., Wijma, B. 2004. A history of sexual abuse and health: a Nordic multicentre study. *BJOG*. 111(10), 1121-1127.
- Irgens, L. M. (2000). The Medical Birth Registry of Norway. Epidemiological research and surveillance throughout 30 years. *Acta Obstet.Gynecol.Scand*. 79, 435-439.
- Kvalvik, L. G., Nilsen, R. M., Skjaerven, R., Vollset, S. E., Midttun, O., Ueland, P. M., Haug, K. 2012. Self-reported smoking status and plasma cotinine concentrations among pregnant women in the Norwegian Mother and Child Cohort Study. *Pediatr.Res.* 72, 101-107.

- Kramer, M. S., Seguin, L., Lydon, J., Goulet, L., 2000. Socio-economic disparities in pregnancy outcome: why do the poor fare so poorly? *Paediatr Perinat Epidemiol.* 14, 194-210.
- Leeners, B., Stiller, R., Block, E., Gorres, G., Rath, W., Tschudin, S. 2013. Prenatal care in adult women exposed to childhood sexual abuse. *J Perinat Med.* 41, 365-374.
- Leserman, J. 2005. Sexual abuse history: prevalence, health effects, mediators, and psychological treatment. *Psychosom.Med.* 67, 906-915.
- Lieberman, A. F., Van Horn, P., Ippen, C. G. 2005. Toward evidence-based treatment: child-parent psychotherapy with preschoolers exposed to marital violence. *J Am Acad Child Adolesc Psychiatry.* 44, 1241-1248.
- Lukasse, M., Schroll, A. M., Ryding, E. L., Campbell, J., Karro, H., Kristjansdottir, H., Schei, B. 2014. Prevalence of emotional, physical and sexual abuse among pregnant women in six European countries. *Acta Obstet Gynecol Scand.* 93, 669-677.
- Lukasse, M., Vangen, S., Oian, P., Kumle, M., Ryding, E. L., Schei, B. 2010. Childhood abuse and fear of childbirth--a population-based study. *Birth.* 37, 267-274.
- Magnus, P., Irgens, L. M., Haug, K., Nystad, W., Skjaerven, R., Stoltenberg, C. 2006. Cohort profile: the Norwegian Mother and Child Cohort Study (MoBa). *Int.J.Epidemiol.* 35, 1146-1150.
- McFarlane, J., Parker, B., Soeken, K., Bullock, L. 1992. Assessing for abuse during pregnancy. Severity and frequency of injuries and associated entry into prenatal care. *JAMA.*, 267, 3176-3178.
- Montgomery, E. 2013. Feeling Safe: A Metasynthesis of the Maternity Care Needs of Women Who Were Sexually Abused in Childhood. *Birth.*, 40, 88-95.
- Montgomery, E., Pope, C., Rogers, J. 2015. A feminist narrative study of the maternity care experiences of women who were sexually abused in childhood. *Midwifery*, 31, 54-60.
- Nerum, H., Halvorsen, L., Straume, B., Sorlie, T., Oian, P. 2013. Different labour outcomes in primiparous women that have been subjected to childhood sexual abuse or rape in adulthood: a case-control study in a clinical cohort. *BJOG.* 120, 487-495.
- NICE. 2014. Domestic violence and abuse: How health services, social care and the organizations they work with can respond effectively. London
- Nilsen, R. M., Vollset, S. E., Gjessing, H. K., Skjaerven, R., Melve, K. K., Schreuder, P., Magnus, P. 2009. Self-selection and bias in a large prospective pregnancy cohort in Norway. *Paediatr.Perinat.Epidemiol.* 23, 597-608.
- O'Reilly, R., Beale, B., Gillies, D., 2010. Screening and Intervention for Domestic Violence During Pregnancy Care: A Systematic Review. *Trauma, Violence, & Abuse.* 11, 190-201.
- Rivara, F. P., Anderson, M. L., Fishman, P., Bonomi, A. E., Reid, R. J., Carrell, D., Thompson, R. S. 2007. Intimate partner violence and health care costs and utilization for children living in the home. *Pediatrics*, 120, 1270-1277.
- Rodriguez, M. A., Sheldon, W. R., Bauer, H. M., & Perez-Stable, E. J. 2001. The factors associated with disclosure of intimate partner abuse to clinicians. *J Fam Pract*, 50, 338-344.
- Rothman, K. J. 2012. *Epidemiology: an introduction.* Oxford: Oxford University Press.
- Sarkar, N. N. 2008. The impact of intimate partner violence on women's reproductive health and pregnancy outcome. *J.Obstet.Gynaecol.* 28, 266-271.

- Schroll, A. M., Tabor, A., Kjaergaard, H. 2011. Physical and sexual lifetime violence: prevalence and influence on fear of childbirth before, during and after delivery. *J.Psychosom.Obstet.Gynaecol.* 32, 19-26.
- Seng, J. S., Rauch, S. A., Resnick, H., Reed, C. D., King, A., Low, L. K., Liberzon, I. 2010. Exploring posttraumatic stress disorder symptom profile among pregnant women. *J.Psychosom.Obstet.Gynaecol.* 31, 176-187.
- Simkin, P., & Klaus, P. H. (2004). *When survivors give birth: understanding and healing the effects of early sexual abuse on childbearing women.* Wash.: Classic Day, Seattle.
- Strand, B. H., Dalgard, O. S., Tambs, K., Rognerud, M. 2003. Measuring the mental health status of the Norwegian population: a comparison of the instruments SCL-25, SCL-10, SCL-5 and MHI-5 (SF-36). *Nord.J.Psychiatry.* 57, 113-118.
- Taft, A. J., Small, R., Humphreys, C., Hegarty, K., Walter, R., Adams, C., & Agius, P. 2012. Enhanced maternal and child health nurse care for women experiencing intimate partner/family violence: protocol for MOVE, a cluster randomised trial of screening and referral in primary health care. *BMC Public Health.* 12, 811.
- Taft, A., O'Doherty, L., Hegarty, K., Ramsay, J., Davidson, L., Feder, G. (2013). Screening women for intimate partner violence in healthcare settings. *Cochrane Database Syst Rev*, 4, CD007007.
- Tambs, K., Moum, T., 1993. How well can a few questionnaire items indicate anxiety and depression? *Acta Psychiatr.Scand.* 87, 364-367.
- Thoresen, S. H., Ole Kristian (red.). (2014). *Vold og voldtekt i Norge. En nasjonal forekomststudie av vold i et livsløpsperspektiv.*[Norwegian] NKVTS, Oslo:.
- Van der Hulst, L. A., Bonsel, G. J., Eskes, M., Birnie, E., van, T. E., Bleker, O. P. 2006. Bad experience, good birthing: Dutch low-risk pregnant women with a history of sexual abuse. *J.Psychosom.Obstet.Gynaecol.* 27, 59-66.
- Veierød, M. B., Lydersen, S., Laake, P. 2012. *Medical statistics: in clinical and epidemiological research.* Gyldendal akademisk, Oslo:.
- Waldenstrom, U., Hildingsson, I., Ryding, E. L. 2006. Antenatal fear of childbirth and its association with subsequent caesarean section and experience of childbirth. *BJOG.* 113, 638-646.
- WHO. 2013. *Responding to intimate partner violence and sexual violence against women: WHO clinical and policy guidelines.* Geneva.

Table 1. Characteristics and outcome of women without and with a mild, moderate or severe history of sexual violence in the Mother and Child Cohort study, N = 78 660 (column %)

	No sexual violence	Mild sexual violence	Moderate sexual violence	Severe sexual violence
	n = 64 192 (81.6%) %	n = 9 444 (12 %) %	n = 2 219 (2.8 %) %	n = 2 805 (3.6%) %
<b>Age*</b>				
<19	1.1	1.9	2.5	6.1
20–25	16.6	18.7	18.7	26.7
26–31	48.8	43.3	42.3	38.5
32–37	29.2	30.8	30.7	23.7
≥38	4.2	5.3	5.7	4.9
<b>Parity*</b>				
Nulliparous	55.4	53.1	51.4	55.4
Multiparous	44.6	46.9	48.6	44.6
<b>Education*</b>				
Primary	1.9	3.3	5.7	9.7
Secondary	34.4	40.4	45.8	54.3
Higher ≤4 years	40.6	36.4	30.7	24.3
Higher >4 years	23.1	19.9	17.8	11.7
<b>Civil status*</b>				
Married/cohabitant	97.3	94.2	92.3	88.9
Other	2.7	5.8	7.7	11.1
<b>Pre pregnancy risk factors*</b>				
Mental distress*	5.1	12.2	14.5	20.9
Fear of childbirth?*	18.3	22.1	23.7	28.8
Hope for a pain-free birth*	7.9	8.5	9.3	11.9
Epidural regardless*	9.8	10.6	11.6	15.0
Desire for caesarean section?*	4.5	5.2	6.4	8.4
Worries about the health of the baby*	11.0	13.7	16.2	20.2
Looking forward to baby*	97.2	95.8	95.3	95.8

\* P<0.001 using Pearson X<sup>2</sup>

<sup>a</sup> P=0.05

Table 2. Odds ratios (and 95 % confidence intervals) for thoughts and wishes about birth for previous and recent sexual violence, stratified by parity

Nullipara	No violence n = 35 570		Previous sexual violence n = 7 280		Recent sexual violence n = 330		
	%	%	OR	AOR <sup>a</sup>	%	OR	AOR <sup>a</sup>
Fear of childbirth	16.4	21.8	1.4 (2.3-2.5)	1.2 (1.1-1.3)	29.7	2.2 (1.7-2.7)	1.4 (1.1-1.8)
Hope for a pain-free birth	7.4	8.8	1.2 (1.1-1.3)	1.0 (0.9-1.1)	12.1	1.7 (1.2-2.4)	1.0 (0.7-1.5)
Epidural regardless	9.1	10.8	1.2 (1.1-1.3)	1.0 (0.9-1.1)	10.6	1.2 (0.8-1.7)	0.8 (0.5-1.1)
Desire for caesarean section	3.2	4.6	1.5 (1.3-1.7)	1.2 (1.0-1.4) <sup>b</sup>	7.9	2.6 (1.8-3.9)	1.7 (1.1-2.5)
Worries about baby's health	11.2	16.0	1.5 (1.4-1.6)	1.2 (1.1-1.3)	23.6	2.4 (1.9-3.1)	1.3 (0.9-1.7)
Looking forward to baby	97.1	96.0	0.7 (0.6-0.8)	0.8 (0.7-0.9)	90.9	0.3 (0.2-0.4)	0.4 (0.3-0.6)
Multipara	No violence n = 28 622		Previous sexual violence n = 6 394		Recent sexual violence n = 363		
	%	%	OR	AOR <sup>a</sup>	%	OR	AOR <sup>a</sup>
Fear of childbirth	20.6	25.4	1.3 (1.2-1.4)	1.1 (1.0-1.2) <sup>b</sup>	25.8	1.3 (1.1-1.7)	1.2 (0.9-1.6)
Hope for a pain-free birth	8.6	9.6	1.1 (1.0-1.2) <sup>b</sup>	1.0 (0.9-1.1)	12.1	1.5 (1.1-2.0)	1.3 (1.0-1.8)
Epidural regardless	10.7	12.6	1.2 (1.1-1.3)	1.1 (1.0-1.2)	12.4	1.2 (0.9-1.6)	1.2 (0.8-1.5)
Desire for caesarean section	6.2	7.4	1.2 (1.1-1.4)	1.0 (0.9-1.1)	7.2	1.3 (0.9-1.9)	1.0 (0.7-1.6)
Worries about baby's health	10.7	14.1	1.4 (1.3-1.5)	1.1 (1.0-1.2) <sup>b</sup>	16.8	1.7 (2.3-2.2)	1.4 (1.1-1.9)
Looking forward to baby	97.2	96.0	0.7 (0.6-0.8)	0.8 (0.7-0.9)	90.7	0.3 (0.2-0.4)	0.3 (0.2-0.5)

<sup>a</sup>= controlled for: Age, education, civil status, pre pregnancy risk factors and mental distress

<sup>b</sup>=p-value <0.05

<sup>c</sup>= additionally controlled for a previous caesarean section

Table 3. Odds ratios (and 95 % confidence intervals) for thoughts and wishes about birth for different levels of sexual violence, stratified by parity

Nullipara	No violence n = 35 570		Mild sexual violence n = 5 016		Moderate sexual violence n = 1141			Severe sexual violence n = 1553		
	%	%	OR	AOR <sup>a</sup>	%	OR	AOR <sup>a</sup>	%	OR	AOR <sup>a</sup>
Fear of childbirth	16.4	20.4	1.3 (1.2-1.4)	1.1 (1.1-1.2)	19.5	1.2 (1.1-1.4)	1.0 (0.8-1.2)	29.4	2.1 (1.9-2.4)	1.5 (1.3-1.7)
Hope for a pain-free birth	7.4	7.8	1.1 (0.9-1.2)	0.9 (0.8-1.0)	8.7	1.2 (1.0-1.5)	1.0 (0.8-1.2)	12.9	1.8 (1.6-2.2)	1.3 (1.1-1.5)
Epidural regardless	9.1	9.9	1.0 (1.0-1.2)	1.0 (0.9-1.1)	9.1	1.0 (0.8-1.2)	0.8 (0.6-1.5)	14.8	1.7 (1.5-2.0)	1.3 (1.1-1.5)
Desire for caesarean section	3.2	4.2	1.3 (1.1-1.6)	1.1 (1.0-1.3)	4.6	1.5 (1.1-1.9)	1.1 (0.8-1.5)	7.0	2.3 (1.9-2.8)	1.5 (1.2-1.9)
Worries about baby's health	11.2	14.7	1.4 (1.3-1.5)	1.1 (1.0-1.2)	16.2	1.5 (1.3-1.8)	1.1 (0.9-1.3)	21.7	2.2 (1.9-2.5)	1.4 (1.2-1.6)
Looking forward to baby	97.1	95.7	0.7 (0.6-0.8)	0.8 (0.6-0.9)	95.6	0.6 (0.5-0.9)	0.7 (0.6-1.0)	96.3	0.7 (0.5-0.9)	0.9 (0.7-1.2)
Multipara	No violence n = 28 622		Mild sexual violence n = 4 428		Moderate sexual violence n = 1 078			Severe sexual violence n = 1 252		
	%	%	OR	AOR <sup>a</sup>	%	OR	AOR <sup>a</sup>	%	OR	AOR <sup>a</sup>
Fear of childbirth	20.6	24.1	1.2 (1.1-1.3)	1.1 (1.0-1.2) <sup>b</sup>	28.1	1.5 (1.3-1.7)	1.2 (1.1-1.4)	28.1	1.5 (1.3-1.7)	1.1 (1.0-1.3)
Hope for a a pain-free birth	8.6	9.3	1.1 (1.0-1.2)	1.0 (0.9-1.1)	9.9	1.2 (1.0-1.4)	0.9 (0.8-1.2)	10.7	1.3 (1.1-1.5)	1.0 (0.8-1.2)
Epidural regardless	10.7	11.5	1.1 (1.0-1.2)	1.0 (0.9-1.3)	14.3	1.4 (1.2-1.7)	1.2 (1.0-1.5) <sup>b</sup>	15.2	1.5 (1.3-1.7)	1.2 (1.0-1.5) <sup>b</sup>
Desire for caesarean section	6.2	6.4	1.0 (0.9-1.2)	1.0 (0.8-1.1) <sup>c</sup>	8.4	1.4 (1.1-1.7)	1.1 (0.8-1.4) <sup>c</sup>	10.2	1.7 (1.4-2.1)	1.3 (1.0-1.5) <sup>b,c</sup>
Worries about baby's health	10.7	12.6	1.2 (1.1-1.3)	1.0 (0.9-1.2)	16.2	1.6 (1.4-1.9)	1.2 (1.1-1.4)	18.3	1.9 (1.6-2.2)	1.2 (1.1-1.5)
Looking forward to baby	97.2	96.0	0.7 (0.6-0.8)	0.8 (0.6-0.9)	95.0	0.5 (0.4-0.7)	0.7 (0.6-0.9)	95.4	0.6 (0.5-0.8)	0.8 (0.6-1.0)

<sup>a</sup>= controlled for: Age, education, civil status, pre pregnancy risk factors and mental distress

<sup>b</sup>=p-value <0.05

<sup>c</sup>= additionally controlled for a previous caesarean section