Prior Pregnancy Loss:
Mental Health During and After Subsequent Pregnancies

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2016

MSc in Clinical Psychology

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Confidential, closed access until 03.06.2019
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Foreword and acknowledgements

This study is a project for the final thesis in clinical psychology at Reykjavik University and is a requirement for the MSc degree. The work was done over three semesters and started in the spring semester of 2015 with preparation, setting up a research plan, writing a draft for a literature review and forming the hypotheses. In the autumn of 2015, the procedure of the study was constructed and the draft for the chapter on methods was written. In the spring semester 2016 the data was analyzed and the results examined. A draft for the chapter on results and discussion was written and after that, the manuscript for the paper was written and completed in May 2016. This study is a secondary analysis of data from an Icelandic study on the mental health of women during and after pregnancy gathered in the period of 2006 to 2012, conducted by psychologist Linda Bára Lýðsdóttir, who also was my supervisor.

Pregnancy loss is the most common complication in pregnancy and is fairly prevalent. Many women experience grief after a pregnancy loss and their mental health is adversely impacted. Studies have shown that heightened symptoms of anxiety and depression are common after a pregnancy loss. Not as much is known about the mental health of these women when they become pregnant again, but studies indicate an increased risk of anxiety and depressive symptoms. The aim of the study was to investigate whether women with a history of pregnancy loss have higher levels of depression (measured by EPDS and DASS) and anxiety (measured by DASS) during and after subsequent pregnancies than women without a history of loss. Another aim of the study was to find out if women in the loss group were more likely to be diagnosed with a mental disorder than the comparison group during pregnancy or after childbirth. It was also examined if women with a history of pregnancy loss were more likely than women in the comparison group to be admitted to a hospital or to need physiotherapy during pregnancy.

I would like to thank Linda Bára Lýðsdóttir for her help and guidance during the course of the project. I would also like to thank Jón Friðrik Sigurðsson for his support and encouragement through these semesters. I thank my fellow students for sharing with me the joy and sorrows of being a student. Least but not last I thank my family, especially my daughter and two sons for their patience and understanding.

Abstract

Limited studies have been conducted on mental health outcomes of pregnant women with a history of pregnancy loss, but there are indications of increased risk of symptoms of anxiety and depression. The main aim of the study is to investigate whether women with a history of pregnancy loss are more likely to experience depression and anxiety both during and after subsequent pregnancies than pregnant women without that history. This was done by comparing the groups concerning different diagnoses during and after pregnancy, and by looking at severity of symptoms. Finally, problems related to physical health were also studied and compared between the two groups. Of the initial 2523 participants, 650 pregnant women were interviewed after being screened positive for depression and/or anxiety pre- and/or postnatally, or randomly selected from the screen negative group. Women with a history of early pregnancy loss were compared to women without a history of pregnancy loss and their scores on EPDS and DASS were compared. Women with a history of pregnancy loss had more anxiety symptoms in pregnancy at week 16 than the comparison group. At week 25 the research group had more depressive symptoms than the comparison group. No differences were found between the groups after childbirth. Women with a history of pregnancy loss were three times more likely to be diagnosed with hypochondriasis in pregnancy than women in the comparison group.

Pregnancy loss is the most common complication in pregnancy and studies indicate that around 10-20% of all clinically detected pregnancies end with pregnancy loss (Andersen, Wohlfahrt, Christens, Olsen, & Melbye, 2000; Rai & Regan, 2006). The term miscarriage is also used for pregnancy loss but the medical term is spontaneous abortion and is defined as a loss of a fetus before 22 weeks of gestation or loss of a fetus that weighs under 500 gr. and has no signs of life (WHO, 2001). In the weeks and months after a loss of a fetus, 10-50% of women experience some form of mental health problems (Lok & Neugebauer, 2007). The most common psychological consequences are grief, anxiety and depression and the symptoms often persist for six months up to a year after the loss, and some women have long lasting psychological morbidity (Lok & Neugebauer, 2007).

Toffol, Koponen and Partonen (2013) reviewed two population-based studies on the effect of pregnancy loss on mental health. Their results showed more depressive symptoms and higher prevalence of diagnoses of depression among the loss group than the group with no history of loss. Lok, Yip, Lee, Sahota, & Chung (2010) found that in the weeks and months after a pregnancy loss, the women with that experience showed significantly more symptoms of depression than women with no such experience. The symptoms were highest immediately after the loss but gradually lessened over time, and the groups were comparable one year after the loss. A prospective study on the mental health of women following pregnancy loss showed that women who had experienced pregnancy loss were more likely to have psychological symptoms than women without such a history (Janssen, Cuisinier, Hoogduin & de Graauw, 1996). They had significantly higher levels of depression, anxiety, somatization and obsessive-compulsive behavior than the comparison group up to 6 months after the loss. After that, the symptoms gradually started to decrease and 12 and 18 months after the loss the differences between the two groups were not significant any longer. The researchers concluded that majority of women recover within a year after pregnancy loss but

that it is nevertheless a stressful life event and can severely affect their mental health especially in the first six months after pregnancy loss. Studies have shown that at least 40-60% of women conceive again within a year after having lost the fetus (Hughes, Turton & Evans, 1999; Love, Bhattacharya, Smith, & Bhattacharya, 2010). It can therefore be expected that some women with a history of pregnancy loss will start a new pregnancy still having symptoms of depression and anxiety as a consequence of their pregnancy loss.

Results from a large Australian longitudinal study on women's health showed that women with a history of pregnancy loss were more likely than women with no history of pregnancy loss to experience sadness, low mood and excessive worry in subsequent pregnancies but not in the postpartum period after live birth (Chojenta et al., 2014). In a literature review of studies on anxiety in pregnancies following pregnancy loss, strong indications of heightened anxiety symptoms compared to the last pregnancy before the loss, were reported (Geller, Kerns & Klier, 2004). The authors pointed out however that limited research had been conducted, and some of the studies included in the review did not have a comparison group, used different definitions of pregnancy loss, or used varied measurement tools. Armstrong (2004) found that women with a history of pregnancy loss had more pregnancy-specific anxieties in the first trimester of a subsequent pregnancy than a comparison group with no such history. In a recently published study, pregnant women with the experience prior loss had increased symptoms of anxiety, stress and depression (McCarthy et al., 2015). The symptoms were generally higher early in pregnancy than later, and those with a history of more than one loss had more symptoms than those with a history of one pregnancy loss. Gong et al. (2013) studied the mental health of women during pregnancies after pregnancy loss. Their results showed that women with a loss experience who had an interpregnancy level of less than six months had 2.7 fold higher risk of anxiety

and 2.5 fold higher risk of depression in their first trimester compared with primigravidae. Women with an interpregnancy interval of 7-12 months had a 2.5 fold higher risk of depression than women without a history of pregnancy loss.

In some studies, a differentiation has been made between state and trait anxiety. State anxiety is anxiety that is specific to a situation or event and is a temporary condition, unlike trait anxiety that is better described as a more lasting construct similar to a personality trait. Fertl, Bergner, Beyer, Klapp and Rauchfuss (2009) investigated anxiety at the first, second and third trimester of pregnancy after a prior loss and once at postpartum. The results showed that among the loss group, pregnancy-related fear and state anxiety were most elevated during the first trimester but reduced significantly after that. In the first trimester, pregnancy-related fear was significantly higher for women who had gone through prior pregnancy loss than for women who had not, but no significant difference was found between the groups for state anxiety. Bergner, Beyer, Klapp and Rauchfuss (2008) measured trait and state anxiety as well as pregnancy- specific anxiety in the first trimester of a subsequent pregnancy. They found that women with a history of pregnancy loss showed more trait anxiety than women without such history, which contradicts what some other studies have found. The researchers concluded that sampling bias, i.e. unusually high percentage of anxious women, may have caused this results. No difference was found in depressive symptoms.

Franche and Mikail (1999) examined woman´s belief about the reasons for pregnancy loss and the effects of their beliefs on psychological adjustment in subsequent pregnancies. Even though this research included not only women with a history of pregnancy loss but also women who had experienced late neonatal death the results are worth noting. Differences between the loss group and comparison groups were not found in state and trait anxiety, but the loss group showed more pregnancy-specific anxiety than the comparison group. Their anxiety was associated with self-criticism, sense of responsibility and the belief that their

behavior affected the health of the fetus. The comparison group experienced less self-criticism than the loss group and did not view their own behavior as affecting the health of the fetus, but rather the behavior of the health care professionals.

It is clear that pregnant women with a prior experience of pregnancy loss are a vulnerable group in need of support especially when they are dealing with long lasting psychological consequences of the loss. Studies indicate that prenatal anxiety and depression have a negative effect on pregnancy outcomes and are connected to a small infant birth weight and greater incidence of premature delivery (Diego et al., 2009; Maina et al., 2008). It is vital to gather enough information about the symptoms these women experience to find out what kind of support or therapy would best meet this group. Pregnant women with prior pregnancy loss, may for instance need different treatment, when faced with mental health problems than women without prior pregnancy loss.

In this study symptoms of anxiety and depression were studied and compared both pre- and postnatally, between women with a history of loss and pregnant women with no such history. Diagnoses of various mental disorders were also assessed and compared between the groups both pre- and postnatally. We hypothesize that women with a history of pregnancy loss, experience more symptoms of depression and anxiety and are more likely to be diagnosed with a mental disorder in subsequent pregnancy than women with no such history.

Method

Participants

In this research, data from an Icelandic study on the mental health of pregnant women gathered in the period of 2006 to 2012, were used. All eligible women receiving care in antenatal clinics at Primary Health Care Centers mainly in the capital area, were invited to take part. The inclusion criteria were to be at least 16 years old, to be pregnant and to speak and write Icelandic. Excluded from the study were those with a history of schizophrenia,

acute psychosis or those with impaired cognitive functioning assessed by the health care staff. If a woman went through a pregnancy loss, a stillbirth or if her baby died at birth her data was withdrawn from the study. Of the 2523 women who participated in the original study, 650 pregnant women were interviewed after being screened positive for depression and/or anxiety or randomly selected from the screen negative group. Thereof 450 women were in the screen positive group and 200 in the screen negative group. The age of the participants ranged from 17 to 47 years with a mean age of 29.02 years (SD = 5.23).

Measures

The Depression Anxiety and Stress Scales (DASS; Lovibond & Lovibond, 1995) is a screening list divided into three subscales, depression-, anxiety-, and stress-scale with 14 items in each subscale. Scores in each subscale range from 0-42 and higher scores indicate more severe symptoms. The reliability of the subscales is good (depression: $\alpha = 0.91$-0.96; anxiety: $\alpha = 0.84$-0.89; and stress: $\alpha = 0.90$-0.93; Brown, Chorpita, Korotitsch & Barlow, 1997; Lovibond & Lovibond, 1995). The reliability of the Icelandic translation has also been shown to be good ($\alpha = 0.97$ for depression; $\alpha = 0.92$ for anxiety; and $\alpha = 0.95$ for stress; Ingimarsson, B., 2010). The cut off score for the subscale for depression was ≥ 10 and the cut off score for anxiety was ≥ 8 but these scores indicate a mild state of the condition (Lovibond & Lovibond, 1995).

The Edinburgh Postnatal Depression Scale (EPDS) is a 10 item self-report questionnaire developed to screen for post-partum depression (Cox, Holden & Sagovsky, 1987). Total scores range from 0-30 with higher scores indicating more signs of depression. The scale includes the most common symptoms of depression but excludes physical symptoms like being tired which is very common around pregnancy and childbirth. The English version of the scale has been validated both for depression in pregnancy and in the

postpartum period and has good psychometric properties (Gibson, McKenzie-McHarg, Shakespeare, Price & Gray, 2009; Murray & Cox, 1990). The Icelandic version of the scale has been shown to have good psychometric properties with reliability $\alpha = 0.8$ (Thome, 2003). The cut off score of ≥ 12 has been suggested and used in previous studies (Bunevicius, Kuminskas, Pop, Pedersen, & Bunevicius, 2009; Gibson et al., 2009) and was therefore chosen for this study.

Questionnaires were designed by researchers and midwives at the maternity unit to gather information about socio-demographic data, recent pregnancy, and traumas and stressful life events in adulthood. Included in *the questionnaire about socio-demographic variables* are questions about age, marital status, employment, education, parity and financial status. *In the questionnaire about the recent pregnancy*, the women were asked if they needed physiotherapy in the first and/or last weeks of pregnancy and if they were admitted to a hospital during pregnancy. These questions were used to examine probable associations between a history of pregnancy loss and physical complications during subsequent pregnancies. *The questionnaire on traumas and stressful life events* in adulthood was used to ask if the participants had experienced a pregnancy loss. All the women that came to the diagnostic interview during and/or after childbirth answered the question about pregnancy loss.

Mini International Neuropsychiatric Interview-plus (MINI; Sheehan, et al., 1997) is a diagnostic interview which was designed to diagnose mental disorders according to the diagnostic criteria of DSM-IV. Diagnoses of the following disorders were used in this study: Major depression, obsessive-compulsive disorder, posttraumatic stress disorder, general anxiety disorder, and hypochondriasis. The MINI has a good test-retest reliability ($k = 0.76$-0.93) and inter-observer reliability is also good ($k = 0.88$-1.0) (Lecrubier, et al., 1997).

The interview was administered by clinicians experienced in distinguishing mental symptoms from pregnancy- related symptoms. Inter-rater reliability between the two main raters was high (Kappa = 0.86 ($p < 0.001$), 95% CI = 0.75 – 0.97; Lydsdottir, et al., 2014).

Procedure

The study is a longitudinal study that follows the women during the pregnancy period and up to five months postnatally. Pregnant women were approached by the midwives or nurses when coming for prenatal examination at weeks 12 -14 and invited to participate in the study. They received information about the study and those willing to take part signed an informed consent that they handed in at week 16. The participants were screened with the DASS and EPDS for anxiety and depression three times (at week 16, 25 and 36) during pregnancy and 9 weeks after giving birth. They also answered the questionnaires 5 months after childbirth. If women were screened positive for depression and/or anxiety at any of the screening points, they were contacted and asked to participate in a psychiatric diagnostic interview once during pregnancy and once postnatally. A random sample from the women who were screened negative, was selected to form a control group and they were also contacted and invited to the psychiatric diagnostic interviews. The interviews took place either in the homes of the participants, at the primary care centers or at the Landspitali hospital two to four weeks after being screened. At weeks 12 to 14 postpartum the women who participated in prenatal interviews were contacted and asked to participate in a second diagnostic interview. In both the pre- and postnatal interviews all the women were assessed with the MINI Plus.

Ethical approval for the study was obtained from the Icelandic National Bioethics Committee (ref no. 05-107-S1) and the Icelandic Data Protection Authority (ref no. S2589). All the women that agreed to participate, signed an informed consent. If the participants needed psychiatric treatment, they were referred to the Mental Health Services at Landspitali-The National University Hospital of Iceland.

Statistical analysis

To infer about associations between socio-demographic characteristics and pregnancy loss or no pregnancy loss, the ratio of women in each condition was computed and a chi-square test was conducted to tell if the differences were significant. Comparisons of symptoms severity between the groups were carried out on each measurement point with independent samples *t*-tests to investigate if the differences between the groups in symptoms of anxiety, depression and stress were significant. Odds ratios were computed to evaluate if the loss group was at higher risk of having complications related to physical health and to be at higher risk of being diagnosed with mental disorder than the group without a history of loss. SPSS (Statistical Package for the Social Sciences, version 21) was used to analyze the data.

Results

Of the 2523 women who answered screening questionnaires at gestation week 16, 25 and 36, and 9 weeks postpartum, 650 were interviewed. Of them, 201 (31%) had a history of pregnancy loss. No significant age difference was found ($t(642) = 1.87$, $p = 0.06$ *between* women with ($M = 29.60$, $SD = 5.49$) and without ($M = 28.77$, $SD = 5.09$) a history of loss. Further socio-demographic characteristics of the participants can be seen in Table 1. There was a significant difference between the groups concerning marital status ($p = 0.019$), parity ($p = 0.026$) and education ($p = 0.007$). In the loss group, 86.1% were married or lived with a partner while 92% of women with no history of pregnancy loss did. The ratio of women in

the loss group that had children was 71% compared to 62.7% of the women that did not have the loss experience. The ratio of women in the loss group that had an education of elementary level or less was 26.7% while 16.2% of the no loss group had the same education level. A total of 44.1% of women in the loss group were educated at university level or equivalent compared to 52.9% of women with no history of loss. There was no significant difference found between women with and without a history of pregnancy loss in terms of employment or how they viewed their financial status.

Table 1. Socio-demographic characteristics of women with and without a history of pregnancy loss. The *N* columns represent the number of women with the specific characteristics, and the *percentage* column represents the ratio.

	Loss				No loss					
	Yes		No		Yes		No			
	N	%	N	%	N	%	N	%	X^2	*P*
Married/living with partner	173	86.1	28	13.9	413	92.0	36	8.0	5.47	0.019
Employed	104	53.9	89	46.1	251	58.1	181	41.9	0.97	0.326
Finances, good/very good	164	83.2	33	16.8	396	88.6	51	11.4	3.44	0.064
Parity, have children	140	71.8	55	28.2	274	62.7	163	37.3	4.94	0.026
Education										
Elementary or less	52	26.7	–	–	72	16.2	–	–		
High school/Vocational	57	29.2	–	–	137	30.8	–	–	9.84	0.007
University or equivalent	86	44.1	–	–	235	52.9	–	–		

Differences between the groups on symptom severity

Anxiety symptoms. Independent samples *t*-test was done when analyzing anxiety scores on the DASS anxiety scale between the two groups. Overall women with a history of pregnancy loss scored higher on all measurement points of pregnancy as can been seen in Figure 1. The difference between women with a history of loss (M = 6.35, SD = 6.41) and women without a history of loss (M = 5.31, SD = 5.40) was significant at 16th week of gestation ($t(324.5) = 1.98$, $p = 0.049$, d = 0.22). No significant difference was found on DASS anxiety scores between the groups at gestation week 25 (p = 0,07) and 36 (p = 0,2) nor 9 weeks ($p = 0.539$) and 5 months ($p = 0.246$) after delivery. Figure 1 also shows that anxiety scores are highest in the first and second trimester of pregnancy and then gradually decrease for both groups.

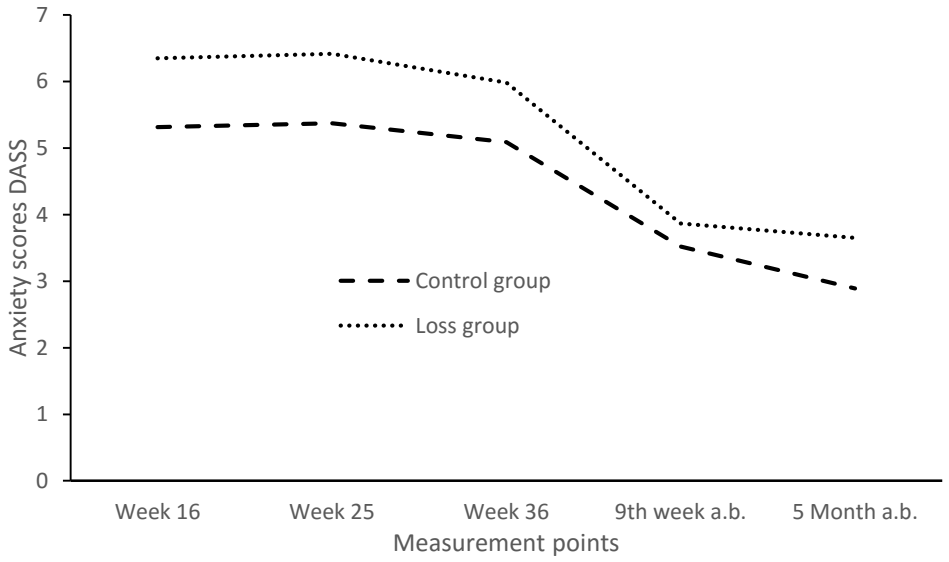

Figure 1. Anxiety scores on DASS at different time points for women with and without a history of pregnancy loss.

Depressive symptoms. As can be seen in Figure 2 depression scores on the DASS depression scale are highest in both groups in the first trimester of pregnancy and decrease

after that for both groups but less for the loss group. Both groups have the lowest scores in the third trimester. The difference between the loss group (M = 6.34, SD = 6.54) and the group with no history of pregnancy loss (M = 5.20, SD = 6.03), was significant at the 25th week of gestation, (t(538) = 1.964, p = 0.050, d = 0.17). There was no significant difference between the groups on DASS depression scores at gestation week 16 and 36 or at the first or second measurement point after childbirth. Note the steep rise of the depression scores for the loss group from 9 weeks to 5 months after childbirth even though the difference was not significant. Figure 3 shows that depression scores on EPDS are relatively stable, and the difference between the groups is small. The scores are highest during the first trimester but decrease gradually until 9 weeks postpartum where they are lowest and then start increasing again for both groups, but more for the loss group than the comparison group. The results from the *t*-tests showed no significant difference between the groups on EPDS depression scores at gestation week 16, week 25, week 36, or at 9 weeks postpartum or 5 months postpartum.

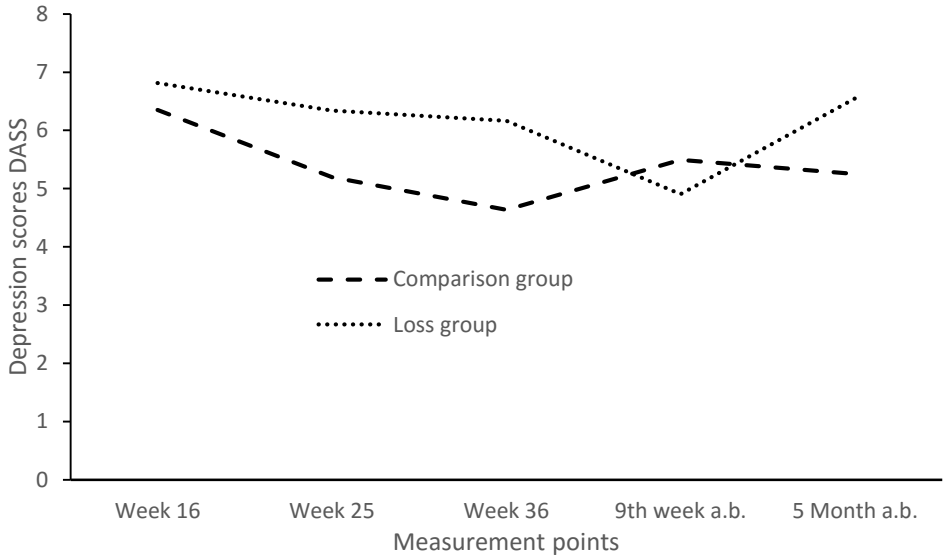

Figure 2. Depression scores on DASS for the two groups, women with a history of pregnancy loss and women with no history of pregnancy loss.

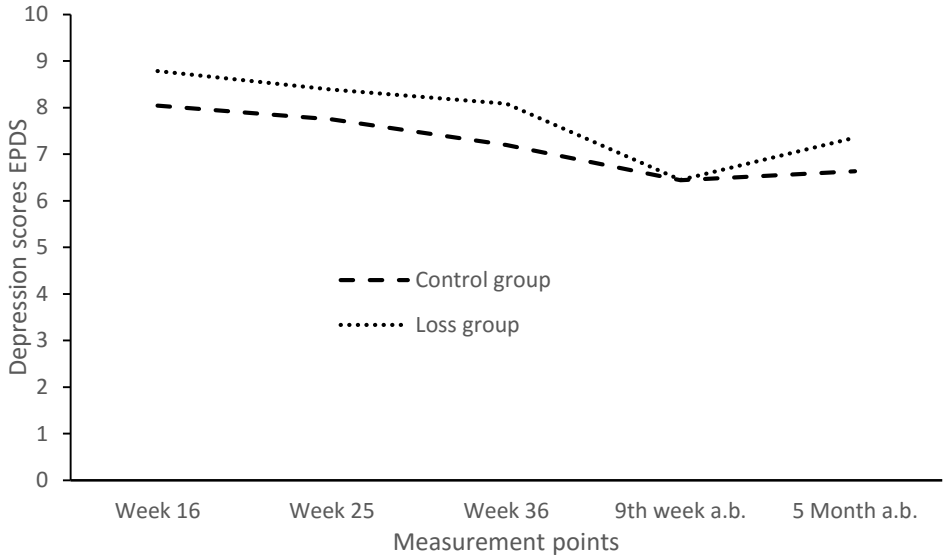

Figure 3. Depression scores on EPDS during and after pregnancy for women with and without a history of pregnancy loss.

Stress symptoms. The loss group had also higher stress scores on the DASS stress scale at gestation week 25 (M = 12.54, SD = 8.04) than the control group (M = 10.66, SD = 7.76, $t(539) = 2.553$, $p = 0.011$, d = 0.22). No difference was found between the groups on week 16 and 36 of gestation and on the two measurement points after delivery.

Health related problems during pregnancy

Of the 129 women who had experienced pregnancy loss and came to the diagnostic interview at postpartum, 7.0% were admitted to a hospital during the first weeks of pregnancy while 3.1% of the 288 women in the comparison group were admitted in the same period. The difference between the groups regarding the risk of being admitted was not significant but not far from it (see Table 2).

Table 2. Number of women that needed admission to a hospital or physiotherapy during pregnancy.

	Loss		No loss		Statistics			
	N[a]	%[b]	N[c]	%[d]	OR	95% CI	X^2	*p*
Admitted, first weeks	129	7.0	287	3.1	2.32	0.89-5.89	3.17	0.075
Admitted, last weeks	129	13.2	289	11.4	1.18	0.63-2.20	0.26	0.609
Physiotherapy	129	24.8	288	22.9	1.11	0.68-1.80	0.18	0.674

[a] Number of women with pregnancy loss; [b] Percentage of women with pregnancy loss that were submitted; [c] Number of women not with pregnancy loss; [d] Percentage of women not with pregnancy loss that were submitted

The difference between the groups in the risk of being admitted in the last weeks of pregnancy was much smaller than in the beginning of pregnancy and was not significant as can be seen in Table 2. The ratio of the women that needed physiotherapy is relatively high for both groups (24.8% for the study group and 22.8% for the comparison group) but no significant difference was found.

The relationship between diagnoses and pregnancy loss

To test if those women with a history of pregnancy loss were more likely to be diagnosed with a mental disorder, the odds ratio was computed for the following diagnoses: hypochondriasis, major depressive disorder, obsessive-compulsive disorder, post-traumatic stress disorder and general anxiety disorder. Detailed results of the tests are reported in Table 3. The relationship between hypochondriasis and pregnancy loss was significant in the first interview, but no other significant relationship was found neither in the first nor second diagnostic interview.

Table 3. The relationship between diagnoses and pregnancy loss.

	Loss		No loss		Statistics			
	N[a]	%[b]	N[c]	%[d]	OR	95% CI	X^2	*p*
First diagnostic interview								
Depression	171	17.0	387	13.7	1.29	0.79-2.11	1.01	0.315
OCD	171	11.1	386	7.0	1.66	0.90-3.08	2.65	0.104
PTSD	171	1.2	389	1.3	0.91	0.18-4.73	0.01	0.910
General anxiety	171	17.5	388	16.5	1.08	0.67-1.74	0.09	0.760
Hypochondriasis	171	5.3	388	1.5	3.58	1.24-10.10	6.28	0.012
Second diagnostic interview								
Depression	130	13.1	288	17.0	0.73	0.41-1.33	1.33	0.307
OCD	130	11.5	290	7.2	1.67	0.83-3.38	2.16	0.146
PTSD	130	0.8	290	3.1	0.24	0.03-1.93	2.10	0.147
General anxiety	130	16.2	290	17.6	0.90	0.52-1.58	0.13	0.719
Hypochondriasis	130	0.8	290	2.1	0.38	0.04-3.08	0.93	0.336

[a] Number of women with pregnancy loss; [b] Percentage of women with pregnancy loss that were diagnosed; [c] Number of women not with pregnancy loss; [d] Percentage of women not with pregnancy loss that were diagnosed

In the first interview, the results showed that women who had a prior experience of pregnancy loss, were 3.58 times more likely to be diagnosed with hypochondriasis than women with no history of such loss. In the second interview no significant difference between the groups was found (OR = 0.38) suggesting that the diagnosis was a consequence of worries related to the pregnancy.

Discussion

This study supports our hypothesis that women with a history of pregnancy loss experience more anxiety and depressive symptoms in pregnancy compared to women with no history of pregnancy loss. Our results showed that women who had experienced a pregnancy loss showed more anxiety symptoms than women who had never experienced a pregnancy loss, in the first trimester of pregnancy or at gestation week 16. Although the difference in anxiety symptoms did not reach significance at other measurement points, it is worth noting

that at gestation week 25 the difference was not far from being significant. The loss group had significantly more depressive symptoms when measured with DASS depression scale than the comparison group at gestation week 25 but not at other measurement points although the difference was almost significant at week 36. Depression was also measured with EPDS, but no significant difference was found between the groups at any of the measurement points. These results indicate that women with a history of pregnancy loss are most vulnerable to anxiety and depression in the first and second trimester, and the risk of depression might also be heightened in the third trimester. When looking at the pregnancy period as a whole and the mental health of the women in general, the results show that the women in the loss group are more vulnerable to distress in pregnancy than women in the group without a history of loss especially early in pregnancy. These results are in accordance with other studies that have found the mental health of these women to be adversely affected e.g. with increased symptoms of anxiety (Fertl et al., 2009; Geller et al., 2004), depression (Franche & Mikail, 1999; McCarthy et al., 2015), sadness, low mood and excessive worry (Chojenta et al., 2014) and with the symptoms generally being higher early in pregnancy. Even though the mean scores for the loss group at these most vulnerable measurement points were under the cut-off scores used, they are heightened and show the need for ongoing screening in pregnancy. The cut-off score used on DASS-anxiety was ≥ 8 and the mean score for the loss group at gestation week 16 was 6.35 which shows anxiety under clinical levels but high enough to require special attention (see Figure 1). These high anxiety scores at this time point are in accordance with previous research (Armstrong, 2004; Fertl et al., 2009; McCarthy et al., 2015) which highlights the first trimester as a vulnerable period. In our research, pregnancy-related anxiety was not examined specifically as has been done in some studies which makes comparisons more complicated, but there are strong indications that pregnancy-related anxiety is highest in the first trimester of pregnancy for women with a history of pregnancy

loss (Armstrong, 2004; Fertl et al., 2009). It is common knowledge that the highest risk for pregnancy loss is in the first trimester of pregnancy which is reflected by the fact that many couples wait with announcing the pregnancy until after the 12th week of gestation. It is therefore most likely that most of the women in the loss group have experienced the pregnancy loss in these first weeks in the past and have both own experience and this knowledge of the risk in this period as a rationale for their pregnancy-related anxiety. It can be stated that pregnancy-related anxiety is not unfounded in this period because there is a real threat but some of the women develop anxiety at clinical levels which makes treatment important.

The cut off-score for DASS-depression was ≥ 10 and the mean score for the loss group at gestation week 25 was 6.34. Even though depressive symptoms are heightened, the scores are not very high. They are actually higher in the first trimester (M = 6.81) even though the difference between groups are not significant (see Figure 2).

In this study, it was also examined if women with a history of pregnancy loss were more likely than women in the comparison group to be diagnosed with a mental disorder in pregnancy or after childbirth. The results showed that women with a history of loss were more than three times more likely to be diagnosed with hypochondriasis in pregnancy than women in the comparison group. This difference was not observed after childbirth. Other diagnoses that were analyzed were major depressive disorder, obsessive-compulsive disorder, post-traumatic stress disorder and general anxiety disorder. No differences in risk of being diagnosed with any of these mental disorders were found between the groups, but the upper limit of the confidence intervals was high in all cases except for general anxiety disorder. This indicates that the variation in the loss group is high emphasizing the importance of screening for mental health problems among women with a history of pregnancy loss. Our results that the loss group was that much more likely to be diagnosed with hypochondriasis is

an important finding which is in harmony with the anxiety and especially the pregnancy-related anxiety that has been seen in other studies as mentioned before. Hypochondriasis is characterized by fear and worries over own health which persist despite medical reassurance (American Psychiatric Association, 2000). The term health anxiety is often used for the condition because of the anxiety involved. In this context, it is interesting to mention Salkovskis (1986) model of health anxiety where the tendency to misinterpret bodily symptoms and sensations as the sign of something being seriously wrong with own health, is proposed. According to the model, a vicious cycle is created, and the anxiety increases both bodily symptoms and hyper vigilance for the symptoms which again increases the anxiety. Health anxiety often begins with some experience with health complications either in self or others. Even though the anxiety and worries of the women in our study group might be more focused on the health of the fetus than own health, these things are connected, and this is something that needs to be studied further.

The data showed that the ratio of women in the loss group that were admitted to a hospital in the first weeks of pregnancy was more than twice as high as the ratio of women in the comparison group and even though the difference was not significant it could be taken as an indication of higher risk of being admitted to a hospital for women with a history of pregnancy loss. This speculation is supported by a significant difference in the diagnosis of hypochondriasis between the groups during pregnancy which could mean that women with a history of pregnancy loss have increased tendency to be overly focused on bodily symptoms which could lead to more likelihood of being admitted to a hospital during pregnancy.

There are several limitations in our study. Anxiety in pregnant women and especially in those with the experience of prior loss may be pregnancy-related and therefore difficult to detect with general screening tools like the DASS. Another limitation to be pointed out concerns a lack of more detailed questions about the pregnancy loss. Our questionnaires did

not include questions about pregnancy-specific anxieties nor how far along the women were in their pregnancy when they lost their fetus which would have been interesting to know.

Conclusion

The study results indicate that women with a history of pregnancy loss are more vulnerable in subsequent pregnancies regarding symptoms of anxiety and depression and might be more likely than women without such history to be diagnosed with hypochondriasis. This highlights the importance of good mental health care during pregnancy especially among women with a history of pregnancy loss.

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