The Relationship Between Women´s Mental Health During Pregnancy and Social Support, Relationship Quality, Attachment and Compliance.

Sara Ósk Kristjánsdóttir

Lokaverkefni til BS-gráðu
Sálfræðideild
Heilbrigðisvísindasvið
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Lokaverkefni til BS-gráðu í sálfræði
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Abstract

Women’s mental health during pregnancy has received increased attention from researchers in recent years. Common mental disorders during pregnancy have been associated with adverse consequences including poor birth outcomes and developmental delays of the unborn baby. The aim of this study was to identify women suffering from common mental disorders during pregnancy and examine differences in social support, relationship quality, romantic attachment and compliance between pregnant women diagnosed and pregnant women not diagnosed with common mental disorders. Sociodemographic differences between the two groups of women were also examined. Participants were 2411 pregnant women in Iceland. All women were screened for depression and/or anxiety during pregnancy. Those who screened positive, as well as a randomly selected control group, were invited to attend a clinical diagnostic interview. Of the 2411 pregnant women participating, 13.3% screened positive for depression and/or anxiety symptoms, 9.4% received a diagnosis, 3.6% were diagnosed with major depression, 7.2% were diagnosed with anxiety disorders, 1.7% were diagnosed with mood disorders other than major depression, 1.9% were diagnosed with somatoform disorder and 0.3% were diagnosed with eating disorders. Pregnant women who were diagnosed with common mental disorders during pregnancy were significantly more likely to have lower levels of education, perceive their financial status as poorer, have received or be receiving mental health treatment, be taking medication, be unmarried or living alone and finally more likely to smoke. Diagnosed women also reported lower levels of social support, lower relationship quality, higher scores on the Anxious and Avoidance dimensions of romantic attachment and more compliance than pregnant women not diagnosed with common mental disorders. This study provides important information regarding the prevalence of common mental disorders during pregnancy in Icelandic women. Identifying risk factors and significant differences regarding social support, relationship quality, romantic attachment and compliance provides valuable information for health care professionals treating women during pregnancy.
Depression has become one of the leading health concerns in the world today. Major depressive disorder (MDD) has been estimated as the third most common psychiatric disorder (Kessler, Chiu, Demler and Walters, 2005) with a lifetime prevalence as high as 19.2% and 12-month prevalence of 8.3% (Kessler et al. 2010). Gender differences in depression have been well documented. Many studies have shown that women are up to twice as likely to experience depression as men (Kessler et al., 2010). Van de Velde, Bracke and Levecque (2010) studied the prevalence of MDD in 23 European countries and found higher levels of depression among women in all 23 countries. A recent longitudinal design study showed that women experienced more major depressive episodes than men and that the episodes tended to last longer. The result also confirmed earlier research outcomes as women were nearly twice as likely to be diagnosed with MDD (Essau, Lewinsohn, Seeley and Sasaqawa, 2010). There is an increase in depressive symptoms during women’s childbearing years. A peak in onset has been found between the ages of 18 and 44 years (Burke, Burke, Rae and Reiger, 1991; Weissman and Olafsson, 1995). During this particular time women tend to make significant changes to their lives including taking on the role of motherhood. In recent years, research concerning pregnancy, birth and the postpartum period has increased in order to explain this peak in depressive symptoms. The majority of the research has focused on depression in the postpartum period while depression and other common mental disorders during pregnancy have received substantially less attention from researchers.

Three meta-analyses have been conducted to identify psychosocial risk factors for postpartum depression. O’Hara and Swain (1996) included 59 studies in their meta-analysis. Beck conducted one in 1996 and an update including 40 new studies to add to the existing 44 in 2001 and Robertson, Grace, Wallington and Stewart (2004) added 10000 women in new studies to the 12000 that were included in the previous meta-analyses. Depression during pregnancy was the strongest risk factor for postpartum depression in all three meta-analyses, as well as anxiety during pregnancy. This conclusion must emphasize the importance of researching depression as well as anxiety and other mental disorders during pregnancy and identifying and offer treatment to those women who suffer from them. This becomes even more evident in light of the potential consequences depression during pregnancy and other mental disorders can have on the unborn baby. Depression during pregnancy has shown a significant association to low birth weight and preterm birth (Grote et al., 2010) while both
depression and anxiety during pregnancy has been linked to developmental delays in children (Brouwers, van Baar and Pop, 2001; Dave, Heron, Evans and Emond, 2008).

**Depression during pregnancy**

Depression during pregnancy is diagnosed using the same criteria as for major depression. The DSM-5 includes a peripartum onset specifier which can be applied to episodes of major depression if onset of symptoms occurs during pregnancy or during the 4 weeks following delivery (American Psychiatric Association, 2013). The criteria necessary to be diagnosed with major depressive disorder are listed in Table 1.

**Table 1. Diagnostic criteria for major depressive disorder in the DSM-5**

<table>
<thead>
<tr>
<th>A.</th>
<th>Five (or more) of the following symptoms have been present during the same 2-week period and represent a change from previous functioning; at least one of the symptoms is either (1) depressed mood or (2) loss of interest or pleasure.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Depressed mood most of the day, nearly every day</td>
</tr>
<tr>
<td>2.</td>
<td>Markedly diminished interest or pleasure in all, or almost all, activities most of the day, nearly every day</td>
</tr>
<tr>
<td>3.</td>
<td>Significant weight loss when not dieting or weight gain or decrease or increase in appetite nearly every day</td>
</tr>
<tr>
<td>4.</td>
<td>Insomnia or hypersomnia nearly every day</td>
</tr>
<tr>
<td>5.</td>
<td>Psychomotor agitation or retardation nearly every day</td>
</tr>
<tr>
<td>6.</td>
<td>Fatigue or loss of energy nearly every day</td>
</tr>
<tr>
<td>7.</td>
<td>Feelings of worthlessness or excessive or inappropriate guilt nearly every day</td>
</tr>
<tr>
<td>8.</td>
<td>Diminished ability to think or concentrate, or indecisiveness, nearly every day</td>
</tr>
<tr>
<td>9.</td>
<td>Recurrent thoughts of death, recurrent suicidal ideation without a specific plan, or a suicide attempt or a specific plan for committing suicide</td>
</tr>
<tr>
<td>B.</td>
<td>The symptoms cause clinically significant distress or impairment in social, occupational or other important areas of functioning</td>
</tr>
<tr>
<td>C.</td>
<td>The symptoms are not due to the direct physiological effects of a substance, or a general medical condition</td>
</tr>
<tr>
<td>D.</td>
<td>The occurrence of the major depressive episode is not better explained by schizoaffective disorder, schizophrenia, schizophreniform disorder, delusional disorder, or other specified and unspecified schizophrenia spectrum and other psychotic disorders</td>
</tr>
<tr>
<td>E.</td>
<td>There has never been a manic episode or a hypomanic episode</td>
</tr>
</tbody>
</table>

Given that some of the diagnostic criteria for major depression are the same as common symptoms following pregnancy, some women suffering from depression do not receive a diagnosis while other women suffering from normal pregnancy related symptoms are
diagnosed with major depression (Kelly, Russo and Katon, 2001). These symptoms could for example be weight gain and an increase in appetite as well as sleeping more, being more tired or having less energy than usual.

Identifying depression in pregnant women

The methods generally used to identify and assess depressed pregnant women are either screening for depressive symptoms or clinical diagnostic interviews conducted by health care professionals. Screening involves identifying individuals who, based on their self-report of symptoms, might be at risk of suffering from a condition or disease. Screening lists are therefore used when trying to identify women suffering from depressive symptoms during pregnancy. The list most commonly used is the Edinburgh Postnatal Depression Scale (EPDS). Although this self-report scale was originally developed to screen for depression at postpartum, it has also been validated for prenatal depression, showing good reliability (Bergink et al., 2011; Bunevicius, Kusminskas, Pedersen and Bunevicius, 2009; Murray and Cox, 1990). Estimated prevalence reported by the EPDS and other screening lists can differ. Bennett et al. (2004) found that the Beck Depression Inventory (BDI) self-report scale identified a larger number of pregnant women with depressive symptoms than the EPDS. The BDI includes more items regarding physical symptoms which might be similar to normal pregnancy related symptoms. This could therefore lead to an overestimation of women potentially suffering from depression. Another variable that could be contributing to different prevalence estimates among screening lists is that studies using the same lists are in some cases using different cut-off scores.

The overestimation of women potentially suffering from depression is one of the problems screening lists face. In some studies, a considerable portion of women screened positive for depression during pregnancy are not diagnosed with depression and even diagnosed with other mental disorders (Lydsdottir et al., (in press); Brouwers et al., 2011; Lydsdottir et al., (in press); Wisner et al., 2013). This emphasizes the importance of the other method, clinical diagnostic interviews, where each individual is assessed on whether he/she meets diagnostic criteria. Only by conducting a clinical diagnostic interview can we be sure that the women screened positive for depression actually are suffering from clinical depression.

Lydsdottir et al. (in press) found that of 153 pregnant women (from the same longitudinal study as the current one) who were screened positive with the EPDS and attended diagnostic interviews, 31,4% were diagnosed with major depression and often had a comorbid mental disorder. As much as 60,8% met diagnostic criteria for an anxiety disorder of which 33,6 %
were diagnosed with an anxiety disorder alone. Given that more than half of the positively
screened women were diagnosed with anxiety and that other studies have found that the
EPDS not only identifies women suffering from depressive symptoms, but is sensitive for
symptoms of anxiety (Rowe, Fisher and Loh, 2008), suggests that anxiety might be prominent
health concern among childbearing women.

Anxiety during pregnancy
Anxiety disorders are among the most common mental disorders, with a 12-month prevalence
as high as 18.1% (Kessler et al., 2005). Both physiological and emotional symptoms are
associated with anxiety disorders. Some of the physiological symptoms are heart palpitation,
muscle tension, dizziness, restlessness and perspiration. The main emotional symptoms are
fear and apprehension (Fauman, 2002). Everybody experiences symptoms of anxiety but for
those suffering from clinical anxiety; symptoms are more intense, more frequent and last for a
longer period of time. Some individuals even feel the need to perform particular behaviors or
avoid situations to minimize their anxiety (Fauman, 2002).

Pregnancy can be a stressful time and there are numerous reasons why women might feel
more anxious during that particular time in their lives. Many women are worried about the
pregnancy and the health of their baby, some are dreading the delivery, while others might be
stressed because of the financial burden that follows becoming a parent. Many studies have
identified anxiety during pregnancy as a significant risk factor for postpartum depression
(Beck, 2001; Robertson et al., 2004). Sutter- Dallay, Giaconne-Marresche, Glatigny-Dallay
and Verdoux (2009) reported that women diagnosed with an anxiety disorder during
pregnancy were three times more likely to become depressed at postpartum. Even anxiety
symptoms, not meeting diagnostic criteria, during pregnancy has been found to be associated
with severe postpartum depression (Moss, Skeuteris, Wertheim, Paxton and Milgrom, 2004).
Heron, O’Connor, Evans, Golding, Clover and the ALSPAC study team (2004) studied
anxiety and depression among 8.323 pregnant women. Of those experiencing anxiety
symptoms during pregnancy, 64% continued experiencing anxiety at postpartum. According
to these studies, anxiety during pregnancy increases the risk of ongoing anxiety as well as
depression in the postpartum period. Therefore, identifying pregnant women suffering from
anxiety and treating them appropriately becomes very important.
Prevalence of depression and anxiety during pregnancy

Many studies and reviews, using either screening instruments or clinical interviews, have been conducted in order to estimate the prevalence of depression during pregnancy. In a French study, Tychey et al. (2005) found the prevalence of 19.1% when screening 277 women for depression in week 32 prenatal while only 11.1% were screened positive at 8 weeks postpartum. Josefsson, Berg, Nordin and Sydsjö (2001) found that of the 1558 Swedish women who completed answering screening lists in late pregnancy (35-36 weeks), 17% were screened positive for depression, 18% when screened 1-5 days postpartum and 13% 6-8 weeks and 6 months postpartum. In a large longitudinal study including 9028 English women, Evans, Heron, Francomb, Oke and Golding (2001) reported that 11.8% were screened positive for depression during week 18 prenatal, 13.6% at week 36 prenatal, 9.2% at 8 weeks postpartum and 8.1% at 8 months postpartum. Leigh and Milgrom (2008) screened 367 Australian women for depression and found the prevalence to be 16.9% during weeks 28-32 prenatal and 11.9% 10-12 weeks postpartum. All the studies mentioned above used screening instruments to estimate depression in the pre- and postnatal period. Results from these studies show that the prevalence of depression during pregnancy may be higher than, or at least equal to that in the postpartum. It has also been shown that screening instruments also identify women who are not suffering from depression (Lydsdottir, et al., in press). Therefore it is not surprising that studies using clinical interviews have reported lower prevalence estimates than studies using screening. Gotlib, Whiffen, Mount, Milne and Cordy (1989) examined the prevalence of depression among 360 pregnant women. Of the 360, 10% met diagnostic criteria for major depression during pregnancy and 6.8% in the postpartum. Half of those diagnosed at postpartum had met diagnostic criteria during pregnancy. Gaynes et al. (2005) conducted a meta-analysis to evaluate the rates of depression during pregnancy and the postpartum. Studies using screening instruments and clinical interviews were included. The mean prevalence of depression during pregnancy was 3.1-4.9% when results from clinical interviews were used and 8.5-11% when results from both clinical interviews and screening instruments were used. A similar trend was also seen in the postpartum, with the mean prevalence being 1-5.6% when results from clinical interviews were used and 6.5-12.9% when results from both methods were used. These results emphasize how difficult it can be to identify women who actually suffer from depression given the relatively lower number of positively screened women receiving a diagnosis. Those who do not receive a diagnosis for depression might even be suffering from other mental disorders (Lydsdottir et al., in press; Rowe et al., 2008; Wisner et al., 2013).
Anxiety during pregnancy has received substantially less attention from researchers. Studies reporting the prevalence of prenatal anxiety are few. Heron et al. (2004) is probably the most cited study and reports that out of 8,323 pregnant women, 14.6% screened positive for anxiety during week 18 prenatal. Another study examined the prevalence of anxiety among 300 Portuguese pregnant women and found 15% screened positive in the first trimester, 12.3% during the second trimester and 18.2% during the third. The prevalence estimates followed a U shaped pattern, with the prevalence being higher in the first and third trimester (Teixeira, Fiqueiredo, Conde, Pacheco and Costa, 2009).

Although estimating the prevalence of depression and anxiety among pregnant women yields different results, the overall outcomes and the potential adverse consequences depression and anxiety during pregnancy can have, do raise concern for the mental health of pregnant women.

**Consequences**

Identifying pregnant women suffering from depression or anxiety disorders is of great importance. Not only because women who experience depression and/or anxiety during pregnancy are more likely to suffer from depression at postpartum (Beck, 2001; O’Hara and Swain, 1996; Robertson et al., 2004), but also to protect the health of the expectant mother and the unborn baby. Bindorf, Madden, Portera and Leon (2001) found an association between increased reports of depression and anxiety and increased functional impairment in women in the early stages of pregnancy. Women suffering from common mental disorders during pregnancy have also been found to be significantly less likely to secure adequate prenatal care (Bonari et al., 2004; Kelley et al., 1999) and depressive symptoms in pregnancy have shown a significant association with adverse health behaviors with an increase of cigarette, alcohol and cocaine use (Zuckerman, Amaro, Bauckner and Cabral, 1989). There is an association between depressive symptoms and increased use of health care services as well as an increase in the number of days from work among primary care patients (Simon, VonKoff and Barlow, 1995). This negative effect may also be present among depressed pregnant women. Depression during pregnancy has also been shown to have a negative effect on birth outcomes. A meta-analysis including 29 studies published between the year 1980 and 2009, showed a statistically significant association between depression in the prenatal period and preterm birth as well as low birth weight (Grote et al., 2010). Depression during pregnancy has shown an association with high miscarriage rate in women suffering from recurrent miscarriages (Sugiura-Ogasawara et al., 2002), spontaneous preterm labor (Dyan et
Given the adverse consequences depression, anxiety and other common mental disorders can have, early detection is vital. The importance of identifying risk factors is great in order for health care professionals to be able to look for symptoms and offer support to women who are at risk. One of the strongest risk factors for depression during pregnancy is previous history of depression (Marcus, Flynn, Blow and Barry, 2003; Richard-Edwards et al, 2006; Ryan, Milis and Misri, 2005). Marcus et al., (2003) screened 3472 women for depression during pregnancy, 42.6% of the women who had previous history of depression reported elevated depressive symptomology during pregnancy. Richard-Edwards et al. (2006) also found previous history of depression to be the strongest risk factor for depression during pregnancy. In addition, studies have shown previous history of anxiety disorder to be a risk factor for depression in the prenatal period (Leigh and Milgrom, 2008). Reviews looking at studies from 1989 to 2008 have found history of mood disorders as well as anxiety disorders to be strong risk factors for depressive symptoms in pregnancy (Leigh and Milgrom, 2008; Ryan et al., 2005). Leigh and Milgrom (2008) conducted a study to identify significant risk factors for depression among 367 pregnant women. Besides previous history of anxiety, six significant risk factors were revealed: social support, low self-esteem, negative cognitive style, major life events, low income and a history of abuse. Together these factors were estimated to explain 78% of the variance in depressive symptoms, with anxiety, low self-esteem and social support being the strongest risk factors. Ryan et al. (2005) reviewed studies from 1989 to 2004 to identify biological and psychosocial risk factors associated with depression among pregnant women. The biological risk factors were history of mood and anxiety disorders, postpartum depression, premenstrual dysphoric disorders and a history of psychiatric illness in the family. The psychosocial risk factors were a history of childhood abuse, younger age, unplanned pregnancy, ambivalence or negative feelings toward the pregnancy, single motherhood, greater number of children, domestic violence, low level of education and unemployment, substance use and smoking, limited social support and marital conflict. In another review
Lancaster et al. (2010) systematically looked at studies from 1980 to 2008 to identify risk factors for depression during pregnancy. In total, 57 studies were included in the review. Several factors, besides history of anxiety disorders, were found to be significantly associated with depression during pregnancy. Domestic violence, unplanned pregnancy and non-cohabitation status were all significant risk factors, while factors including smoking, alcohol use, illicit drug use, parity, maternal ethnicity and maternal age all showed inconsistent findings. More than 20 articles on social support were included in the review. Although social support from any source showed a significant association with depression during pregnancy, intimate partner support was one of the strongest factors in the review. It is therefore not surprising that one of the risk factors was relationship quality, with improved quality being predictive of lower risks of depression during pregnancy.

**Social support**

Social support studies center on the effect close relationships have on people’s wellbeing (Wills, 1985). The amount and quality of social support people receive or take advantage of from family, friends and significant others, is not the same. Many studies have been conducted and many emphasize the importance social support can have on our health. When investigating the positive association between social support and wellbeing, Cohen and Wills (1985) found evidence for a buffering model. According to the model social support protects individuals from the adverse effects that can follow stressful life events by providing interpersonal resources that tend to the needs of the individual during stressful times. Evidence has also been found in the physiological field were social support had a suppressing effect on the level of cortisol and anxiety scores of participants, during a stressful event (Heinrichs, Baumgartner, Kirschbaum and Ehler, 2003). The buffering effect has been documented in pregnant women as well. Glazier, Elgar, Goel and Holzapfel (2004) found that pregnant women perceiving their social support as being inadequate showed stronger symptoms of depression and anxiety during similar stressful situations, than pregnant women perceiving a higher level of social support.

A large number of studies have been conducted to examine the association between social support and depression during pregnancy. Two big reviews were conducted to identify risk factors in the literature of depression during pregnancy (Lancaster et al., 2010; Ryan et al., 2005). In both reviews there was an association between social support and depressive symptoms, with one of them listing intimate partner support as one of the strongest risk factors. Additionally, many studies have shown this robust association between social support
and depressive symptomology (Berthiaume, David, Saucier and Borgeat, 1998; Besser, Priel, Wiznitzer, 2002; Goodman and Tully, 2009; O’Hara and Swain, 1996). Given that previous history of depression is one of the strongest risk factors for depression during pregnancy, many women experience recurrent episode of depression while pregnant. Goodman and Tully (2009) found low levels of social support to be significantly associated with a recurrence of depression among previously depressed pregnant women.

The importance of social support is evident as a lack of it has both indirect and direct effects on pregnancy related outcomes. Studies have shown that the amount of social support received during pregnancy has a direct effect on birth weight and preterm births (Feldman, 2000 and Nkansah-Amnkra, 2010). In a recent study, Nylen, O’Hara and Engeldinger (2013) did not find a direct association between social support and pregnancy related outcomes. Depression during pregnancy however, had significant associations with birth outcomes. Only when women were depressed during pregnancy did social support show any form of association with birth outcomes, as women who reported adequate partner support gave birth to older, heavier and healthier babies than depressed women not receiving enough partner support. Social support, can help reduce the risk of depression during pregnancy, as well as depression during the postpartum (O’Hara and Swain, 1996) and at the same time minimize the adverse effects prenatal depression can have on babies. Adequate screening for social support can therefore help health professionals identify women at risk for depression an offer them appropriate treatment earlier.

Different aspects of social support have shown different strengths in association with depressive symptoms during pregnancy. Extensive research has gone in to these different aspects, with most of it enhancing the importance of the partner relationship. O’Hara and Swain (1996) reported that although overall social support was associated with depression during pregnancy and the postpartum, social support from the father showed a stronger association with depression during this time in a women’s life. Other studies also emphasized the role of the women’s partner during pregnancy (Besser et al., 2002; Collins, 1993; Lancaster et al., 2010; Priel and Besser, 2001; Zelkowit et al., 2008). Pajulo, Savonlahti, Sourander, Helenius and Phia (2001) found a significant association between depressive symptoms and perceived social support from the partner as well as the mother among 391 pregnant women. The importance of the partner aspect of social support has also been linked to better labor progress and Apgar score (Collins, 1993). Although social support in general is beneficial for pregnant women, support from partners or significant others work as an even
better protective factor for depressive symptoms during pregnancy. This opens up questions regarding the role relationship satisfaction and adjustment play on women’s wellbeing during this time in their lives.

**Relationship quality**

There is a large body of literature on the association between relationship quality and mental health. Being married has been associated with better mental health (Barett, 2000; Lehtinen and Joukamaa, 1994) indicating that aspects involving romantic relationships are important to people’s wellbeing. Many studies regarding relationship quality and satisfaction have been conducted through the years. Substantial evidence has indicated a robust association between relationship quality and depression (Beach, Arias, O’Leary, 1986; Beach, Smith and Fincham, 1994; Culp and Beach, 1998; Finchman, Beach, Harold and Osborne, 1997). Whisman (2001) conducted a review of 26 cross-sectional studies and found the quality of the marital relationship to be negatively associated with depressive symptoms for both men and women. One study found that both men and women, who were dissatisfied in their marriages, were almost three times more likely to meet criteria for a major depressive disorder in the subsequent year (Whisman and Bruce, 1999). Of all the participants meeting criteria for major depressive disorder, 30% reported being dissatisfied in their marriages. Although a significant association between relationship quality and depressive symptoms has been found in both men and women, studies suggest that there is some form of gender difference (Whisman, 2001). Finchman et al. (1997) found the association between marital satisfaction and depressive symptoms to be slightly stronger for women while studying 150 newlyweds. A difference in the causal direction of the association was also found, with marital satisfaction having a more severe effect on depressive symptoms among women and depressive symptoms having a more severe effect on marital satisfaction for men. Beach, Katz and Brody (2008) replicated the Finchman et al. (1997) study but failed to find these gender differences. Cristian-Herman, O’Leary and Avery-Leaf (2001) found that 38% of women who had experienced a negative event in their marital relationship and who had no former history of depression were clinically depressed.

The link between relationship quality and mental health seems to be an important factor in understanding depression and other mental disorders during pregnancy. Two reviews that systematically looked at studies from 1980 to 2008 identified marital conflict, intimate partner support and relationship quality as strong risk factors for depression during pregnancy (Lancaster et al., 2010; Ryan et al., 2005). Witt et al. (2010) studied data from 3051 pregnant
women representative of the USA population and found a relationship between not being married and poor mental health during pregnancy. In addition supportive relationships were shown to have a positive effect on mental health during pregnancy as they enhanced feelings of wellbeing and made pregnancy related changes less stressful for the expectant mother. Records and Rice (2007) found that a lack of partner support and marital satisfaction had a significant impact on depressive symptoms during pregnant women’s third trimester. One study even showed that single mothers reported fewer depressive symptoms during pregnancy than pregnant women in poor relationships with a low perception of partner support (Bilszta et al., 2008). This emphasizes the importance of relationship quality instead of relationship status, and the role it plays in the mental health of pregnant women. However, not every couple’s mental health is affected by difficulties in their relationships. Other important variables might therefore be moderating the association between these two variables. Scott and Cordova (2002) suggest that romantic attachment might be one of those variables as adult attachment style was found to mediate the association between relationship quality and depressive symptoms.

**Romantic attachment**

Attachment theory was originally developed by Bowlby, in order to explain how an emotional bond between an infant and its primary caregiver and the effect it has on the infant’s later development. According to Bowlby the attachment we adopt as infants can have an effect on all our subsequent relationships (Bowlby, 1969). He emphasized the importance of a “warm, intimate, and continuous relationship” with the primary caregiver, for the child’s wellbeing and development (Bretheron, 1992). Ainsworth was another prominent figure in the development of attachment theory. She and her colleagues identified three different attachment styles by observing young children’s reaction to being abandoned and reunited with their primary caregiver. The three styles identified in the classical observational study were secure, anxious and avoidant attachment (Ainswoth and Bell, 1970). Bowlby believed that people’s attachment style remained unchanged throughout their adult lives (Bowlby, 1979). This may have inspired other researchers to apply attachment principles to adult relationships.

Two distinct approaches used to study adult attachment emerged in the 1980’s, one focusing on individuals’ descriptions of their relationships with primary caregivers with the use of interviews and the other focusing on more recent romantic relationships and using self-report instruments to assess individuals’ attachment styles (Bartholomew and Shaver, 1998;
The former depends on trained professionals to assess attachment styles based on people’s recollections of their early relationships with their caregivers, while the second is more straight-forward, asking the participant to evaluate their own attachment style by looking back on previous romantic relationships (Bartholomew, 1990). In this study the latter approach was used.

Romantic attachment was first formulated in an article published by Hazan and Shavier in 1987. They suggested that the way adults form romantic relationships could be explained as an attachment process, where previous history of infant-caregiver relationships where reflected in the way individuals bonded with adult partners. They developed a questionnaire based on Ainsworth’s three attachment styles; secure, avoidant and anxious. The scale required participants to look back on their former romantic relationships and assess which style described them most accurately (Bartholomew and Shaver, 1998; Hazan and Shaver, 1987). They found the distribution between the three attachment styles to be similar in their adult participants as reported in studies involving infants, with 56% categorizing themselves as secure, 24% as avoidant and 20% as anxious. The subjects in the study were 620 individuals replying to the questionnaire that was published in a local newspaper. Subjects categorized as secure described romantic relationships as more happy, friendly and trusting and were more accepting towards their partner’s imperfections. Their relationships lasted longer and the rate of divorce was lower among them. Avoidant subjects were more likely to report a fear of being close to a partner and experience a fluctuation of emotion and jealousy. Anxious subjects were more preoccupied with a desire for reciprocation, reported more fluctuation in emotion and experienced more sexual attraction and jealousy. Participants with unsecure attachment styles (anxious or avoidant) had a more negative outlook on love (Hazan and Shaver, 1987).

Bartholomew (1990) divided attachment style in adulthood into four different categories instead of three; secure, preoccupied, fearful and dismissing. Usually people are associated with a variation of categories instead of belonging only to one. An individual with secure attachment style is comfortable being close to other people and more likely to be satisfied and secure in a relationships. Preoccupied attachment style is associated with being very dependent on others and their acceptance. Avoidant attachment is divided into fearful and dismissive. Fearful attachment is associated with individuals who feel the need for social connections but at the same time feels undeserving of love and support from others, while dismissive attachment is associated with an avoidance of relationships due to the belief that they aren’t necessary (Bartholomew and Horowitz, 1991). Brennan, Clark and Shaver (1998)
wanted adult attachment to be placed on two dimensions; an Anxious dimension and an Avoidant dimension. Brennen developed a 38-item self-report scale based on these two dimensions where the four attachment styles suggested by Bartholomew could be obtained by four clusters on the dimensions. Individuals with a secure attachment style would score low on both the Anxious and the Avoidant dimensions, individuals with a Preoccupied style would score high on the Anxious dimension and low on the Avoidant dimension, individuals with a Dismissive style would score low on the Anxious and high on the Avoidant dimensions and finally, individuals with a Fearful style would score high on both dimensions.

Romantic relationships have repeatedly been studied through the framework of romantic attachment. Substantial evidence has been found in support of there being an association between individual’s romantic attachment styles and relationship or marital satisfaction (Banse, 2004; Kane et al., 2007; Meyers and Landsberger, 2002). Given that relationship quality and adjustment is associated with depressive symptoms among women in general and during pregnancy (Cristian-Herman et al., 2001; Lancaster et al., 2010; Ryan et al., 2005; Whisman, 2001), it is likely that the attachment style of pregnant women might be affecting their depressive symptomatology. Romantic attachment may even affect depressive symptoms directly as many studies have found an association between adult romantic attachment styles and depression, with insecure attachment style being associated with an increase in depression and secure attachment being associated with lower levels of depression (Cantazaro and Wei, 2010; Cooper, Shaver and Collins, 1998; Murphy and Bates, 1997; Roberts, Gotlib and Kassel, 1996; Wei, Mallinckrodt, Russell and Abraham, 2004;). Simpson et al. (2003) found the same trend among women during the pre- and postnatal period, with insecure attachment style increasing the likelihood of suffering from depressive symptoms. He also found social support to be a mediating variable, with increased support resulting in significant decrease in depressive symptoms. In this study, Brennan’s self-report scale was used in order to identify women with anxious and avoidant attachment and to see if there might be an association between attachment and the mental health of the pregnant Icelandic women.

**Compliance**

Gudjonsson(1989) has defined compliance as “the general tendency or susceptibility of individuals to comply with requests and obey instructions that they would rather not do, for some immediate instrumental gain”. A significant sex difference has been shown to apply to compliance, with women being more compliant than men (Gudjonsson and Sigurdsson, 2003). Gudjonsson (2006) developed the Gudjonsson Compliance Scale (GCS) which has for
the most part been used to study compliance in association with interrogative settings. There has been a distinction made between compliance in impersonal and personal settings, with the former applying to interrogative or more formal settings and the later involving close relationships (Gudjonsson, Sigurdsson, Einarsson and Einarsson, 2008). Research has shown a difference in the reasoning or motivation for complying in these settings. Individuals who comply in impersonal settings do so because they fear the consequences that would follow were they not to comply. Compliance in personal settings on the other hand is motivated by a fear of rejection and abandonment from loved ones. Although a distinction has been made between these two settings, they are both related to a broader concept of compliance (Gudjonsson, 1989; Gudjonsson et al., 2008).

Impett and Peplau (2002) studied the relationship between compliance and adult attachment style. They reported that women who had unsecure attachment styles were more likely to comply to having unwanted sex with their partner. Of the 125 female college students participating in the study, anxiously attached women were the most likely to consent to unwanted sex and did so mainly to avoid creating a conflict and out of fear that the partner would lose interest in them. Gudjonsson, Sigurdsson, Lydsdottir and Olafsdottir (2008) studied the relationship between adult attachment styles and compliance among 377 of the pregnant Icelandic women participating in the current study. They found a significant association between unsecure attachment and compliance. Although both anxious and avoidant dimensions of attachment were associated with compliance, the association was highest among the Fearful type. These results cause a concern for women who are insecure in their attachment since their potential compliance could have an effect on their relationships with their partners (Banse, 2004; Kane et al., 2007; Meyers and Landsberger, 2002) and potentially increase their risk of experiencing depressive symptoms (Cantazaro and Wei, 2010; Simpsson et al., 2003; Wei et al., 2004).

**Aims and hypotheses**

The importance of identifying factors that affect women’s mental health during pregnancy cannot be stressed enough. Adverse consequences that follow depression and/or anxiety during pregnancy do not only affect the expectant mother’s mental health in the long run (Robertson et al., 2004), but also the birth outcomes (Grote et al., 2010) and development of the unborn baby (Deave et al., 2008). Studies have been conducted and found education level, smoking, history of psychiatric illness in the family (Ryan et al., 2004), low income (Leigh and Milgrom, 2008) and cohabitational status (Lancaster, 2010) to be some of the risk factors
significantly associated with women’s health during pregnancy. In addition, social support (Goodman and Tully, 2005; Lancaster et al., 2010; Ryan et al., 2005) as well as relationship quality (Wit et al., 2010), has shown a significant association with common mental disorders during pregnancy. Less data has been reported between romantic attachment and common mental disorders prenatal, although Simpson et al. (2003) found that insecure attachment style increased the likelihood of suffering from depressive symptoms during the pre- and postnatal period. No study, except this one, has studied the association between compliance and mental health during pregnancy, or looked into the relationship between social support, relationship quality, romantic attachment and compliance and prenatal mental health. Some researchers have however studied the association between some of these factors. Relationship and marital satisfaction has been repeatedly associated with romantic attachment styles (Bangse, 2004; Kane et al., 2007 and Meyers and Landsberge, 2002). Social support might also affect the relationship between attachment styles and depression with increased support reducing depressive symptoms (Simpson et al., 2003). Scott and Cordova (2002) found adult attachment style to mediate the association between relationship quality and depressive symptoms. In their study dyadic adjustment was only negatively associated with depression for the spouses who were categorized as having an anxious attachment style. Avoidant attachment style did not have any effect on the association between dyadic adjustment and depressive symptoms in the same study.

The aim of this study will be to identify women suffering from common mental disorders during pregnancy. When it comes to studies regarding women’s mental health during pregnancy, major depression has received the most attention from researchers, followed by anxiety disorder although they are few in comparison. Other mental disorders have received substantially less attention. However, Lydsdottir et al. (in press) reported that a considerable portion of pregnant women (from the same longitudinal study as the current one) who screened positive on the EPDS were diagnosed with other mental disorder than major depression. Of the 153 women who attended clinical diagnostic interviews, 31,4% were diagnosed with major depression, 60,8% were diagnosed with anxiety disorders, 13,1% with bipolar disorder, 11,6% with somatoform disorder, 5,2% with dysthymia and 2% were diagnosed with eating disorders. It was therefore decided to examine differences between women diagnosed with common mental disorder during pregnancy, instead of just depression or anxiety. In this study, common mental disorders refers to the following mental disorders: major depressive episode, dysthymia, bipolar disorder, generalized anxiety disorder (GAD), panic disorder, agoraphobia, social phobia, simple phobia, obsessive compulsive disorder.
(OCD), posttraumatic stress disorder (PTSD), somatic symptom disorder, body dysmorphic disorder, hypochondria, pain disorder, anorexia nervosa and bulimia nervosa. Sociodemographic differences between women diagnosed and not diagnosed with these common mental disorders will also be assessed on the following variables: Age, educational level, perceived financial status, history of taking medication for depression, anxiety or other mental disorders, receiving mental health treatment currently or before, smoking and cohabitating. Finally, while examining the relationship between social support, relationship quality, romantic attachment and compliance with common mental disorders during pregnancy, the following hypothesis will be tested:

1. The perception of social support, especially from significant others, will be significantly different between pregnant women diagnosed and pregnant women not diagnosed with common mental disorders, with diagnosed women perceiving lower levels of support.

2. The reported quality of relationships will be significantly different between pregnant women diagnosed and pregnant women not diagnosed with common mental disorders, with diagnosed women reporting lower relationship quality.

3. Pregnant women diagnosed and pregnant women not diagnosed with common mental disorders, will have different scores on the Avoidant and Anxious dimensions of adult romantic attachment, with diagnosed women scoring higher on both dimensions.

4. There will be a difference in compliance between pregnant women diagnosed and pregnant women not diagnosed with common mental disorders, with diagnosed women being more compliant.
Methods

Participants
Participants were 2411 Icelandic women attending prenatal care in 11 Primary Health Care Centers in Iceland. To be included in the study, participants had to be at least 16 years old and be able to read and speak Icelandic. Women with a previous history of Schizophrenia, acute psychotic symptoms or significant cognitive impairment, were excluded from the study. The participant’s data was excluded from the study if they lost their baby during pregnancy, had to give birth to a stillborn baby or the baby died during delivery. Women who gave birth before week 36 of pregnancy did not complete the third screening (administered during week 36) but the previously collected data was not excluded. The mean age of the participants was 28.5 years (SD= 5.14), with the youngest participant being 17 years and the oldest being 48 years old.

Measures

The Edinburgh Postnatal Depression Scale (EPDS) (Cox, Holden and Sagorcsky, 1987) is a 10-item self-rating scale designed to screen for postpartum depression among women. The participant indicates how much each item/statement applies to her by rating it on a four-point scale ranging from 0) No, not at all to 3) Yes, very often. Higher scores indicate more depressive symptoms. The point for each item are then added together to make up a total score. The highest possible score is therefore 30 and the lowest possible score is 0. Among items were: I have looked forward with enjoyment to things, I have been anxious and nervous for no good reason and I have been so unhappy that I have had difficulty sleeping. Although the scale was originally developed to screen for depression at postpartum, it is the most commonly used screening scale for women in the prenatal period as it has been shown to be a reliable scale for the detection of depressive symptoms during pregnancy as well as at postpartum (Bergink et al. 2011; Bunevicius et al., 2009; Gibson et al., 2009; Murray and Cox, 1990). It has shown good sensitivity and specificity in identifying pregnant women suffering from depression (Bunevicius et al., 2009). A scale has good sensitivity when it identifies those who have the symptoms it is screening for while the specificity of a scale refers to it only identifying those who have the appropriate symptoms instead of individuals without them. The problem with screening scales is that in order to identify those who are suffering from depression, women who do not meet diagnostic criteria will also be identified. The EPDS has been found to have a high false positive rate, even identifying women suffering from other mental disorders than depression (Lydsdottir et al., in press). Research
has supported that the optimal cutoff score in pregnancy should be lower than in the postpartum, preferably around 11/12 (Bunevicius et al., 2009; Bergink et al., 2011). The cutoff score chosen for this study was 12.

**The Depression Anxiety and Stress Scale (DASS)** (Lovibond and Lovibond, 1995) is a 42-item self-report instrument developed to screen for symptoms of depression, anxiety and stress. The scales is divided into the Depression subscale, the Anxiety subscale and the Stress subscale, each including 14 items; Depression, Anxiety and Stress. Participants indicate on a four-point scale, ranging from 0) Did not apply to me very much to 3) Applied to me very much, or most of the time, how much each item/statement has applied to her/him during the last week. Among items were: *I found it difficult to relax, I felt down and blue and I was in a state of nervous tension.* A total score and subscale scores can be calculated with the total score ranging from 0-126 and the subscale scores ranging from 0-42. Higher scores indicate more symptoms of depression, anxiety and stress (Lovibond and Lovibond, 1995). Participants in the current study screened positive if they scored 10 or above on the Depression subscale and 8 or above on the Anxiety subscale. The author of the DASS evaluated it’s psychometric properties in a sample of 717 participants and found the reliability of the subscales to be satisfactory, with Cronbach’s Alpha being 0.91 for the Depression subscale, 0.84 for the Anxiety subscale and 0.9 for the Stress subscale (Lovibond and Lovibond, 1995). Crawford and Henry (2003) also found the reliability of the DASS to be very good, and the convergent and discriminant validity of the subscales to be adequate.

**The Dyadic Adjustment Scale (DAS)** (Spanier, 1976) is a 32-item self-report instrument, with varying response scales, that is designed to measure several components of relationship adjustment. It was developed by Spanier who recognized the necessity for a scale that could be used to assess people’s relationship quality, not just marriages but other similar dyads as well. When it comes to assessing relationship quality, the DAS is probably one of the most widely used scales as it was found to be used over a 1000 times during the first 10 years following its development (Spanier, 1985). The scale can be used as a tool to assess various aspects of people’s relationships as well as the association between dyadic adjustment and other variables of interest. The scale consists of four subscales. The Dyadic Consensus subscale regards the degree to which the respondent agrees with the partner and includes 13 items, with one of them being: *Handling family finances.* The Dyadic Satisfaction subscale regards whether the respondent is satisfied in the relationship and consists of 10 items, with one of them being: *In general, how often do you think that things between you and your*
partner are going well. The Dyadic Cohesion subscale is supposed to measure to what degree the respondent and the partner participate in activities together and consists of 5 items, with one of them being: Work on a project together. Finally, the Affective Expression subscale regards how much affection there is between the respondent and the partner and consists of 4 items, with one of them being: Being too tired for sex (Spanier, 1976). The score on each subscale can be summed to form a total DAS score that can range from 0 to 151, with higher scores reflecting a better dyadic adjustment. Graham, Liu and Jeziorski (2006) conducted a meta-analysis to estimate the reliability of the scale as a whole as well as each individual subscale. They used reliability estimates from 91 studies which included a total of 25,035 participants. The mean reliability of the DAS total score was $\alpha 0.915$. The mean reliability of the Dyadic consensus, Dyadic satisfaction and Dyadic cohesion were $\alpha 0.872$, $\alpha 0.848$ and $\alpha 0.789$ respectively. The reliability of these subscales as well as the total DAS score remained stable across various samples. The Affective Expression subscale on the other hand had a mean reliability of $\alpha 0.714$ which is acceptable but it did not remain stable across all samples. A possible explanation for this could be the relatively few items in the subscale and that those items do not have the same response format (Graham, Liu and Jeziorski, 2006).

The Multidimensional Scale of Perceived Social Support (MSPSS) (Zimet, Dahlem, Zimet and Farley, 1988) is a 12-item self-report scale that assesses the participants perceived social support adequacy. It is easy to use and brief scale containing 3 subscales. The Family subscale includes 4 items, with one of them being: My family really tries to help me. The Friends subscale also includes 4 items, with one of them being: I can count on my friends when things go wrong. Finally, the Significant Other subscale includes 4 items, with one of them being: There is a special person who is around when I am in need. All three subscales are rated on a seven-point scale ranging from 1) Very strongly disagree to 7) Very strongly agree. A total score is calculated by summing the result for all the items. The possible score range is between 12 and 84, the higher the score the higher the perceived social support. In addition, a score for the separate subscales can be calculated by summing the response from all the items included in each subscale. The possible score range for each subscale is therefore between 4 and 28 (Zimet, Dahlem, Zimet and Farley, 1988). The reliability of the scale as a whole as well as each subscale was estimated by the authors of the MSPSS. Cronbach’s alpha was 0.88 for the whole scale, 0.87 for the Family subscale, 0.85 for the Friend subscale and 0.91 for the Significant other subscale. Many other studies have shown the MSPSS scale to have good psychometric properties (Dahlem, Zimet and Walker, 1991 and Canty-Mitchell and Zimet, 2000).
**Experiences in Close Relationships (ECR)** (Brennan, Clark and Shaver, 1998) is a 36-item self-rating scale assessing adult romantic attachment. Each item is rated on a 7-point scale ranging from 1) disagree strongly to 7) agree strongly. Two dimensions form the 18-item Avoidant and 18-item Anxious subscales. An item included in the Avoidant subscale/dimension is: *I try to avoid getting close to my partner*. An item included in the Anxious subscale/dimension is: *I need a lot of reassurance that I am loved by my partner*. Individuals that show a high score on the Anxious dimension are more preoccupied with their relationship and fear abandonment and rejection from others while those who score high on the Avoidance dimension show an avoidance of intimacy and feel uncomfortable with close relationships and relying on others. The scale was developed by asking 1086 college students to answer a 323-item list as well as asking them questions regarding social behavior, relationships and personality (Brennan, Clark and Shaver, 1998). Both subscales have shown good reliability with Cronbach’s alpha being between 0,93-0,95 for the Avoidance subscale and 0,91-0,94 for the Anxious subscale (Brennan, Clark and Shaver, 1998; Wei, Russell, Mallincrodt and Vogel, 2007).

**The Gudjonsson Compliance Scale (GCS)** (Gudjonsson, 1989) is a 20-item self-rating scale that measures how willing people are to comply to other peoples demands and requests in order to prevent a confrontation or please others. Among items are: *I tend to give into people who insist that they are right and I try hard to please others*. Each item on the scale is a true/false statement and the total score can range from 0-20. If the participant indicates that the statement is false the item gets a score of 0 and a score of 1 it is indicated to be true. Higher scores indicate greater the compliance. Cronbach’s coefficient alpha for the scale has been between 0,71-0,75 in different studies indicating acceptable reliability (Gudjonsson, 2003).

**The Mini-International Neuropsychiatric Interview Plus (MINI-PLUS)** is a structured diagnostic interview for DSM-IV RT and ICD-10 psychiatric disorders. It is shorter than older structured diagnostic interviews with an administration time of approximately 15 minutes. It was designed to be used both in clinical- and research settings. It includes 23 modules for psychiatric disorders compatible with the DSM-IV RT and ICD-10. This research included 20 modules which were: major depressive episodes, bipolar disorder, dysthymia, suicidality, (hypo) manic episodes, panic disorders, agoraphobia, social phobia, simple phobia, obsessive compulsive disorder (OCD), posttraumatic stress disorder (PTSD), alcohol abuse and dependence, non-alcohol psychoactive substance use disorder, anorexia nervosa, bulimia nervosa, generalized anxiety disorder (GAD), somatic symptom disorder, body dysmorphic
disorder, hypochondria, and pain disorder. The Mini+ has shown good psychometric properties with good inter-rater and test-retest reliability (Lecrubier et al., 1997; Sheenan et al., 1998).

Procedure
This study is a part of a larger, longitudinal study on mental health among Icelandic women during pregnancy and the postpartum. The participants were approached while attending their first prenatal check-up during week 12-14 of pregnancy. Those who agreed to participate in the study were asked to sign a consent form during the next check-up at week 16 prenatal. The participants were then screened for depression and anxiety with the help of the EPDS and the DASS during the same check-up. The participants were additionally asked to complete the ECR scale and GCS. Screening with the EPDS and the DASS was repeated during week 24 and 36 prenatal. Women who screened positive for depression and anxiety on the EPDS and the Depression and Anxiety subscales of the DASS were contacted 2-4 weeks following screening and invited to attend a clinical diagnostic interview. A total of 2411 women participated in the study and completed screening instruments, the ECR and GCS during week 14, 24 and 36. Of those 2411 women, 521 attended clinical diagnostic interviews and of those 320 scored above the cutoff point on the EPDS and/or DASS and 201 were randomly selected from the group of women who did not screen positive on the EPDS and the DASS. The interviews were conducted by experienced female clinicians who diagnosed the women according to DSM-IV-TR with the help of the MINI+. While attending the interview, participants were asked to complete the MSPSS and DAS as well. Sociodemographic information including, age, educational level, perceived financial status, history of taking medication for depression, anxiety or other mental health problems, receiving mental health treatment currently or before from psychiatrists, psychologists or their general practitioner, family history of mental disorders, smoking and whether participants were cohabitating or married, were also gathered.

The study was approved by the Icelandic National Bioethics Committee and the Icelandic Data Protection Authority. If participants were in need of psychiatric treatment, they were referred to appropriate treatment at the Mental health Services at Landspítlar – The National University Hospital of Iceland.
Statistical analysis

Descriptive statistics were used to examine the distribution of various variables in the data. Chi-square tests for associations were conducted in order to assess if there were differences on eight socio-demographic variables between women diagnosed and women not diagnosed common mental disorders. Standardized residuals were examined in order to understand the association tested for in the Chi-square test and the odds ratios were calculated for the associations found. A nonparametric Mann-Whitney U test was conducted in order to determine if there were differences in the scores on each scale and subscale between diagnosed and non-diagnosed women and the estimated effect size, r, of the differences were calculated. SPSS 17.0 statistical software was used for statistical analysis.
Results

Descriptive statistics

Of the 2411 women screened for depression and anxiety with the EPDS and the DASS at week 14, 24 and 36 prenatal, 320 (13,27%) were screened positive and attended clinical diagnostic interviews. In addition, 201 women were randomly selected from those who did not screen positive to attend clinical diagnostic interviews. Out of all the participants, 227 (9,4%) received a diagnosis for a common mental disorder, 87 (3,6%) were diagnosed with major depression, 174 (7,2%) were diagnosed with anxiety disorders and 41 (1,7%) were diagnosed with mood disorders other than major depression, 45 (1,9%) were diagnosed with somatoform disorders and 7 (0,3%) were diagnosed with eating disorders. There was a considerable amount of comorbidity between disorders. Of the 2411 participants, 65 (2,7%) were diagnosed with both major depression and anxiety disorders, 34 (1,4 %) were diagnosed with both anxiety disorders and a mood disorders other than major depression, 32 (1,3%) were diagnosed with somatoform disorder and depression and finally 20 (0,8%) were diagnosed with somatoform disorder and major depression.

The results of the Chi-square tests of eight sociodemographic variables are listed in table 2 as well as the number and percentage of women diagnosed and women not diagnosed with common mental disorders within each variable.

A significant difference was found between the educational level of the two groups and the standardized residuals indicated that there were significantly more diagnosed women (z = 3,1) and significantly fewer non-diagnosed women (z = -2,7) who had only completed an elementary-level education than expected if there was no difference between the groups. Based on the odds ratio, the odds of being diagnosed with a common mental disorder during pregnancy was 2,83 times higher for women not educated beyond the elementary level (table 2).

There was also a significant difference between the perceived financial status of the women in the two groups with the standardized residuals indicating that there were significantly more diagnosed women (z = 2,1) who perceived their financial status to be poor than expected if there was no difference between the groups. Based on the odds ratio, the odds of being diagnosed with a common mental disorder during pregnancy was 2,30 times higher for women perceiving their financial status to be poor (table 2).

A significant difference was found between medication to treat a common mental disorder for the women in the two groups with the standardized residuals indicating that there
were significantly more diagnosed women \((z = 3.1)\) and significantly fewer non-diagnosed women \((z = -2.7)\) taking medication for a common mental disorder than expected if there was no difference between the groups. Based on the odds ratio, the odds of being diagnosed with a common mental disorder during pregnancy was 5.31 times higher for women taking medication to treat their mental disorders (table 2).

**Table 2.** Socio-demographic characteristics of women diagnosed and not diagnosed with common mental disorders

<table>
<thead>
<tr>
<th></th>
<th>Diagnosed (n=227)</th>
<th>Not diagnosed (n=294)</th>
<th>(\chi^2) (df)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elementary level only</td>
<td>65 (29%)</td>
<td>37 (12.6%)</td>
<td>21.53 (1)*****</td>
</tr>
<tr>
<td>Beyond elementary-level</td>
<td>159 (71%)</td>
<td>256 (87.4%)</td>
<td></td>
</tr>
<tr>
<td><strong>Perceived financial status</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>37 (16.4%)</td>
<td>23 (7.8%)</td>
<td>9.06 (1)**</td>
</tr>
<tr>
<td>Good</td>
<td>189 (83.6%)</td>
<td>270 (92.2%)</td>
<td></td>
</tr>
<tr>
<td><strong>Medication for depression, anxiety or other mental disorders</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taking medication</td>
<td>26 (11.7%)</td>
<td>7 (2.4%)</td>
<td>17.75 (1)*****</td>
</tr>
<tr>
<td>Not taking medication</td>
<td>196 (88.3%)</td>
<td>280 (97.6%)</td>
<td></td>
</tr>
<tr>
<td><strong>Receiving mental health treatment</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>51 (25.4%)</td>
<td>17 (6.1%)</td>
<td>35.32 (1)*****</td>
</tr>
<tr>
<td>No</td>
<td>150 (74.6%)</td>
<td>260 (93.9%)</td>
<td></td>
</tr>
<tr>
<td><strong>Previous mental health treatment</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>149 (65.6%)</td>
<td>89 (30.3%)</td>
<td>70.73 (1)*****</td>
</tr>
<tr>
<td>No</td>
<td>78 (34.4%)</td>
<td>205 (69.7%)</td>
<td></td>
</tr>
<tr>
<td><strong>History of mental disorders in immediate family</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>152 (73.8%)</td>
<td>180 (62.9%)</td>
<td>6.42 (1)*</td>
</tr>
<tr>
<td>No</td>
<td>54 (26.2%)</td>
<td>106 (37.1%)</td>
<td></td>
</tr>
<tr>
<td><strong>Cohabitng – married</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>191 (84.9%)</td>
<td>278 (94.6%)</td>
<td>13.69 (1)*****</td>
</tr>
<tr>
<td>No</td>
<td>34 (15.1%)</td>
<td>16 (5.4%)</td>
<td></td>
</tr>
<tr>
<td><strong>Smoking during pregnancy</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>40 (17.7%)</td>
<td>9 (3.1%)</td>
<td>31.93 (1)*****</td>
</tr>
<tr>
<td>No</td>
<td>186 (82.3%)</td>
<td>284 (96.9%)</td>
<td></td>
</tr>
</tbody>
</table>

\* \(p \leq 0.05\), ** \(p \leq 0.01\), *** \(p \leq 0.001\)

The two groups of women differed significantly in regards to mental health treatment from psychiatrists, psychologists or their general practitioner with the standardized residuals indicating that significantly more diagnosed women \((z = 4.2)\) and significantly fewer non-diagnosed women \((z = -3.6)\), were receiving mental health treatment at the time of the diagnostic interview than expected if there was no difference between the groups. Based on odds ratio, the odds of being diagnosed with a common mental disorder during pregnancy was 5.20 times higher for women receiving mental health treatment (table 2).
The two groups of women differed significantly in regards to previous mental health treatment from a psychiatrists, psychologists or their general practitioner as well, with standardized residuals indicating that there were significantly more diagnosed women \((z = 4.4)\) and significantly fewer non-diagnosed women \((z = -3.9)\) who had received mental health treatment previously. The standardized residuals also revealed that fewer diagnosed women \((z = -4.1)\) and more non-diagnosed women \((z = 3.6)\) had not received mental health treatment previously. Based on the odds ratio, the odds of being diagnosed with a common mental disorder during pregnancy was 4.40 times higher for women having received mental health treatment previously (table 2).

Although a significant difference was found between the two groups of women regarding the mental health of their immediate family (parents and siblings) \((\chi^2(1) = 11.73, p < 0.05)\), there were no \(z\)-values indicating significant differences between the two groups (table 2).

There was a significant difference between the two groups of women regarding cohabiting or marriage with standardized residuals revealing that fewer diagnosed women \((z = 2.6)\) and more non-diagnosed women \((z = -2.3)\) were living alone or were unmarried. Based on the odds ratio, the odds of being diagnosed with a common mental disorder during pregnancy was 3.09 higher for unmarried women and women living alone (table 2).

Finally, a significant difference was found between the two groups of women regarding smoking during pregnancy with standardized residuals indicating that there were more diagnosed women \((z = 4.0)\) and fewer non-diagnosed women \((z = -3.5)\) smoking during their pregnancy. Based on the odds ratio, the odds of being diagnosed with a common mental disorder during pregnancy was 6.79 times higher for women that smoked during their pregnancy (table 2).

*Mann-Whitney U test and Effect Size*

The mean scores, highest and lowest scores, range and Cronbach’s Alpha for each self-report scale and subscale as well as the number of participants completing each scale, is reported in table 3. All the scales, with the exception of the DASSExpression subscale, had satisfactory reliability, with Cronbach’s Alpha ranging from 0.749 to 0.953. The Cronbach’s Alpha for the DASSExpression subscale is below the commonly used threshold for reliability satisfaction of 0.7 (Nunnally, 1978).
Table 3. Descriptive statistics and Cronbach’s Alpha

<table>
<thead>
<tr>
<th></th>
<th>Diagnosed M (SD)</th>
<th>Not diagnosed M (SD)</th>
<th>Min-Max (Range)</th>
<th>a</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EPDS</strong></td>
<td>521 11,76 (4,50)</td>
<td>6,35 (4,03)</td>
<td>0-26 (26)</td>
<td>0,869</td>
</tr>
<tr>
<td><strong>DASSDepression</strong></td>
<td>521 10,25 (7,54)</td>
<td>3,22 (4,30)</td>
<td>0-39 (39)</td>
<td>0,922</td>
</tr>
<tr>
<td><strong>DASSAnxiety</strong></td>
<td>521 9,14 (6,49)</td>
<td>3,60 (3,85)</td>
<td>0-34 (34)</td>
<td>0,851</td>
</tr>
<tr>
<td><strong>DASSStress</strong></td>
<td>521 17,15 (8,58)</td>
<td>8,33 (6,84)</td>
<td>0-41 (41)</td>
<td>0,934</td>
</tr>
<tr>
<td><strong>ECRAvoidance</strong></td>
<td>519 3,02 (1,15)</td>
<td>2,29 (0,90)</td>
<td>1-6,56 (5,56)</td>
<td>0,922</td>
</tr>
<tr>
<td><strong>ECRAnxious</strong></td>
<td>519 3,78 (1,06)</td>
<td>2,88 (1,02)</td>
<td>1-6,17 (5,17)</td>
<td>0,916</td>
</tr>
<tr>
<td><strong>EGS</strong></td>
<td>479 11,35 (3,96)</td>
<td>9,51 (3,22)</td>
<td>2-20 (18)</td>
<td>0,758</td>
</tr>
<tr>
<td><strong>MSPSSSignificant Others</strong></td>
<td>510 25,43 (3,92)</td>
<td>26,61 (3,31)</td>
<td>4-28 (24)</td>
<td>0,953</td>
</tr>
<tr>
<td><strong>MSPSSFamily</strong></td>
<td>509 21,65 (5,50)</td>
<td>24,51 (4,10)</td>
<td>4-28 (24)</td>
<td>0,918</td>
</tr>
<tr>
<td><strong>MSPSSFriends</strong></td>
<td>512 20,92 (5,14)</td>
<td>24,05 (4,09)</td>
<td>4-28 (24)</td>
<td>0,942</td>
</tr>
<tr>
<td><strong>DAS</strong></td>
<td>432 113,37 (15,11)</td>
<td>122,78 (12,38)</td>
<td>60-146 (86)</td>
<td>0,923</td>
</tr>
<tr>
<td><strong>DASConsensus</strong></td>
<td>468 49,49 (7,00)</td>
<td>53,43 (5,89)</td>
<td>21-65 (44)</td>
<td>0,855</td>
</tr>
<tr>
<td><strong>DASSatisfaction</strong></td>
<td>448 39,47 (5,74)</td>
<td>42,30 (4,06)</td>
<td>15-50 (35)</td>
<td>0,854</td>
</tr>
<tr>
<td><strong>DASExpression</strong></td>
<td>477 8,74 (2,16)</td>
<td>9,77 (1,77)</td>
<td>2-12 (10)</td>
<td>0,645</td>
</tr>
<tr>
<td><strong>DASCohesion</strong></td>
<td>478 15,74 (3,76)</td>
<td>17,05 (3,16)</td>
<td>5-24 (19)</td>
<td>0,749</td>
</tr>
</tbody>
</table>

* EPDS and DASS scores obtained at week 16 prenatal

Before deciding what kind of test was to be used to analyze the differences in scores between women diagnosed and not diagnosed with common mental disorders, the distribution of the scores on each scale needed to be examined for both groups in order to determine if the scores were normally distributed. In order to do that, skewness and kurtosis as well as their standard error, were examined, Kolmogorov-Smirnov’s test of normality was conducted and the histogram and Normal Q-Q plots were inspected visually. The scores on all scales for both groups deviated in some way from normal distribution. All three DASS subscales, the EPDS and the two ECR scales were all positively skewed, while the DAS and it’s three subscales as well as the three MSPSS subscales were all negatively skewed. The GCS was the only scale which was not skewed and seemed to be normally distributed when inspecting the histograms and the Normal Q-Q plots. The Kolmogorov-Smirnov test of normality was significant for all scales in both groups, except the ECRAnxiety score for diagnosed women, indicating a non-normal distribution.

Given that the scores were not normally distributed, a nonparametric Mann-Whitney U test was conducted in order to determine if the scores on each scale and subscale differed
between diagnosed and non-diagnosed women. The score’s distributions on all the scales for both diagnosed and non-diagnosed women were similar, when visually inspected. Therefore when comparing the scores of the two groups, the median is reported. Table 4 lists the results of the Mann-Whitney U test, including the score median for diagnosed and non-diagnosed women on all the scales and r, the estimated effect size.

**Table 4. Mann-Whitney U test**

<table>
<thead>
<tr>
<th>Scale</th>
<th>Diagnosed Median</th>
<th>Not diagnosed Median</th>
<th>U</th>
<th>Z</th>
<th>P</th>
<th>r</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPDS*</td>
<td>12</td>
<td>6</td>
<td>12097,5</td>
<td>-12,50</td>
<td>&lt; 0,001</td>
<td>0,548</td>
</tr>
<tr>
<td>DASSDepression*</td>
<td>9</td>
<td>2</td>
<td>11859,0</td>
<td>-12,65</td>
<td>&lt; 0,001</td>
<td>0,554</td>
</tr>
<tr>
<td>DASSAnxiety*</td>
<td>8</td>
<td>2</td>
<td>14322,5</td>
<td>-11,22</td>
<td>&lt; 0,001</td>
<td>0,492</td>
</tr>
<tr>
<td>DASSStress*</td>
<td>16</td>
<td>7</td>
<td>13076,0</td>
<td>-11,87</td>
<td>&lt; 0,001</td>
<td>0,520</td>
</tr>
<tr>
<td>ECRAvoidance*</td>
<td>2,83</td>
<td>2,11</td>
<td>20002,0</td>
<td>-7,74</td>
<td>&lt; 0,001</td>
<td>0,339</td>
</tr>
<tr>
<td>ECRAnxious</td>
<td>3,69</td>
<td>2,78</td>
<td>17955,5</td>
<td>-8,95</td>
<td>&lt; 0,001</td>
<td>0,392</td>
</tr>
<tr>
<td>EGS</td>
<td>11</td>
<td>9</td>
<td>20135,5</td>
<td>-5,34</td>
<td>&lt; 0,001</td>
<td>0,234</td>
</tr>
<tr>
<td>DAS</td>
<td>114</td>
<td>124,1</td>
<td>19988,0</td>
<td>-6,73</td>
<td>&lt; 0,001</td>
<td>0,295</td>
</tr>
<tr>
<td>DASConsensus</td>
<td>49</td>
<td>53</td>
<td>17734,0</td>
<td>-6,12</td>
<td>&lt; 0,001</td>
<td>0,268</td>
</tr>
<tr>
<td>DASSatisfaction</td>
<td>9</td>
<td>10</td>
<td>20046,5</td>
<td>-5,19</td>
<td>&lt; 0,001</td>
<td>0,227</td>
</tr>
<tr>
<td>DASExpression</td>
<td>40</td>
<td>43</td>
<td>16381,5</td>
<td>-5,19</td>
<td>&lt; 0,001</td>
<td>0,227</td>
</tr>
<tr>
<td>DASCohesion</td>
<td>16</td>
<td>17</td>
<td>22628,5</td>
<td>-3,46</td>
<td>≤ 0,001</td>
<td>0,152</td>
</tr>
<tr>
<td>MSPSSSignificant Others</td>
<td>28</td>
<td>27</td>
<td>24846,0</td>
<td>-4,80</td>
<td>&lt; 0,001</td>
<td>0,211</td>
</tr>
<tr>
<td>MSPSSFamily</td>
<td>23</td>
<td>26</td>
<td>21325,0</td>
<td>-6,42</td>
<td>&lt; 0,001</td>
<td>0,281</td>
</tr>
<tr>
<td>MSPSSFriends</td>
<td>21</td>
<td>24,5</td>
<td>19910,5</td>
<td>-7,45</td>
<td>&lt; 0,001</td>
<td>0,326</td>
</tr>
</tbody>
</table>

* EPDS and DASS scores obtained at week 16 prenatal

According to the Man-Whitney U test, women diagnosed with common mental disorders, scored significantly higher on the EPDS, the DASSDepression, the DASSAnxiety, and the DASSStress GCS as well as the Avoidant and Anxious dimensions of the ECR. Diagnosed women scored significantly lower on the DAS, the DASConsensus, the DASSatisfaction, the DASExpression and the DASCohesion as well as the MSPSSSignificant Others, the MSPSSFamily and the MSPSSFriends. The largest effect sizes were moderate (r = 0.492-0.554) and were found between the differences on the EPDS scores as well as the scores of the three DASS subscales. The effect sizes calculated between the differences on the other scales ranged from small to medium,  \( r = 0,152 \) to  \( r = 0,392 \).
Discussion

The main purpose of this study was to examine the relationship between women’s mental health during pregnancy and social support, relationship quality, attachment and compliance. Women suffering from common mental disorders were identified. Differences between diagnosed and non-diagnosed women regarding social support, relationship quality, romantic attachment, compliance as well as sociodemographic variables, were examined.

Prevalence

Participants in this study were 2411 pregnant Icelandic women. Of those, 13.7% were screened positive for symptoms of depression and/or anxiety during pregnancy. Previous studies screening for depression during pregnancy have reported prevalence between 10% and 20% (Josefsson et al., 2001; Leigh and Milgrom, 2008; Tyche et al., 2005). Different sample sizes, sample selections, screening lists and cut-off points used could possibly explain the large range in percentages reported in these studies. The percentage of screened positive women found in this study is consistent with the 11.8-13.6% of pregnant women screened positive for depression in a large longitudinal study conducted by Evans et al. (2001) as well as the 14.3% of pregnant women screened positive for symptoms of anxiety in a study conducted by Heron et al. (2004). However, the percentage of women who were subsequently diagnosed with depression, anxiety and other common mental disorders in this study was considerably lower, with 3.6% being diagnosed with major depression, 7.2% with anxiety disorders, 1.7% with mood disorders other than major depression, 1.8% with somatoform disorders and finally 0.3% with eating disorders. This is consistent with previous studies using clinical diagnostic interviews reporting lower prevalence estimates than studies using screening instruments. A meta-analysis evaluating the rates of depression during pregnancy, reported a mean prevalence of 3.1-4.9% for studies using diagnostic interviews (Gaynes et al., 2005).

Major depression is probably the disorder that has received the most attention from researchers when it comes to women’s mental health during pregnancy. Studies examining the prevalence of other mental disorders are few in comparison. That does not necessarily mean that other mental disorders should be overlooked. Lydsdottir et al. (in press) reported that a considerable portion of pregnant women (from the same longitudinal study as the current one) who screened positive on the EPDS were diagnosed with other mental disorder than major depression, including anxiety disorders, bipolar disorder, somatoform disorder, dysthymia and eating disorder. In this study, anxiety disorders were the most common in the prenatal period;
almost twice as many women were diagnosed with anxiety disorders than were diagnosed with depression. This is interesting given that prenatal depression has received much more attention from researchers than prenatal anxiety. It is not unlikely that some women find their pregnancy to be a stressful period in their lives and may even experience some form of anxiety while dealing with pregnancy related issues. This is not a plausible explanation for the number of women receiving a diagnosis in the current study, as the interviews were administered by experienced clinicians who were well-aware of common worries and stressors associated with normal pregnancies.

There was also a considerable amount of comorbidity between the diagnosed disorders in the study. A majority of women diagnosed with major depression during pregnancy were also diagnosed with a comorbid anxiety disorder, with 2.7% of the 2411 women receiving a diagnosis for both disorders. There was also comorbidity between anxiety disorders and mood disorders other than major depression, with 1.4% receiving both diagnosis. There was a 1.3% comorbidity between anxiety disorders and somatoform disorders and finally 0.8% were diagnosed with both depression and somatoform disorder. According to this study, focusing mainly on depression or anxiety is not enough in order to understand the mental health problems some women are facing during pregnancy.

**Sociodemographic variables**

Differences between diagnosed and non-diagnosed pregnant women on eight sociodemographic variables were examined (table 2). Results indicated differences in the educational-level of women diagnosed and women not diagnosed with common mental disorders. Only completing an elementary-level education almost tripled the risk of being diagnosed with common mental disorders during pregnancy. This is consistent with other studies identifying low levels of education as a significant risk factor for depression during pregnancy (Ryan et al., 2005).

Another significant difference was found regarding perceived financial status. Women who perceived their financial status to be poor were more than two times more likely to be diagnosed with common mental disorders during pregnancy. This supports previous studies identifying low income as a significant risk factor for depression during pregnancy (Leigh and Milgrom, 2008). Having a baby and caring for a child is expensive and could be adding to the worried some women might be experiencing during pregnancy.

More diagnosed than non-diagnosed pregnant women were or had been receiving mental health treatment from psychiatrists, psychologists or their general practitioner at the time of
the study. Women receiving mental health treatment at the time were five times more likely to be diagnosed with common mental disorders while women who had received mental health treatment at a previous time were four and a half times more likely to be diagnosed. Tests yielded similar results for women taking medication for depression, anxiety or other mental disorders as they were more than five times more likely to be diagnosed with common mental disorders. This is not surprising given that a history of mental disorders is one of the strongest risk factors for depression during pregnancy (Leigh and Milgrom, 2008; Ryan et al., 2005). It also seems obvious to assume that individuals receiving mental health treatment or taking medication would be more likely to be diagnosed with mental disorders given the symptoms they must be experiencing urging them to seek treatment in the first place. The chi-square test (table 2) indicated that significantly more diagnosed than non-diagnosed pregnant women had a history of mental disorder in their immediate family. However, the values of the standard residuals indicated that there was no significant difference between the two groups of women. Because of these conflicting results, the variable will not be discussed further.

Regarding cohabiting and marriage, being unmarried or living alone tripled the risk of being diagnosed with common mental disorders during pregnancy. A large body of evidence has shown that being married is associated with better mental health (Banett, 200; Joukamaa, 1994). Non-cohabitation as well as not perceiving adequate support from partners has been identified as risk factors for depression during pregnancy (Lancaster et al., 2010). Given these findings it is not surprising that unmarried women and women living alone in our study were more likely to be suffering from common mental disorders. Expecting a child and becoming a parent includes big changes and more responsibility, facing that alone might possibly cause increased stress and worry.

Just as in previous studies (Reyna et al., 2005) smoking was found to be a risk factor for being diagnosed with common mental disorders, with women smoking during pregnancy being almost seven times more likely to be diagnosed.

Social support
The first hypothesis was that the perception of social support, especially from significant others, would be significantly different between pregnant women diagnosed and pregnant women not diagnosed with common mental disorders during pregnancy, with diagnosed women perceiving lower levels of social support. Results supported a part of the hypothesis; pregnant women diagnosed with common mental disorders perceived significantly less social support from significant others, family and friends. However, this association did not apply especially to the
significant others subscale of MSPSS. As a matter of fact, the smallest difference between the two groups was found when examining social support from significant others (table 4). The difference between the two groups on the family subscale was also small while the differences on the friends subscale were moderate (table 4). Finding a significant difference between the two groups supports previous studies reporting an association between social support and mental health during pregnancy (Besser, Priel and Wiznizer, 2002; Goodman and Tully, 2009; Heinrichs et al., 2003). Many studies have however, repeatedly emphasized the importance of the partner and significant others, when reporting the association between the different aspects of social support. This study does not support those reports.

A possible explanation for the small difference in perceived social support between diagnosed and non-diagnosed women in this study might possibly be social desirability bias. Some pregnant women might be experiencing a lack of support without admitting it, given that it is generally regarded as more socially desirable to bring a child into a supportive relationship or a supportive family. With the regards to the significant others, the items included in the subscale might possibly explain the small difference between the two groups. All of the four items apply to someone significant in the participant’s lives, but they do not specify the partner. The likelihood of Icelandic pregnant women having someone in their lives they can rely on for support is good, especially since Iceland is a small country and family members tend to live relatively close to one another. In order to know what individual the significant others subscale of the MSPSS applies to, the participants would have to identify the person while filling out the self-report scale. None the less, the results suggests that feeling unsupported by significant others, family and especially friends, might play a part in the mental health of pregnant Icelandic women.

**Relationship quality**

The second hypothesis was that the reported quality of the relationships would be significantly different between pregnant women diagnosed and pregnant women not diagnosed with common mental disorders, with diagnosed women reporting lower relationship quality. Results supported the hypothesis; diagnosed women scored significantly lower on self-report scales measuring the quality of their relationship with their partner. The differences between the two groups were significant for the overall DAS score as well as the four DAS subscales (table 4). This supports previous studies finding a strong association between relationship quality and mental health (Culp and Beach, 1998; Fincham et al., 1997; Witt et al., 2010). Relationship quality has repeatedly been associated with depression...
Numerous studies have emphasized the importance of relationship elements to women’s mental health during pregnancy, with marital conflict, intimate partner support and relationship quality being identified as strong risk factors for prenatal depression (Lancaster et al., 2010; Ryan et al., 2005). Bilszta (2008) even reported that the quality of the relationship was more important than relationship status with regards to women’s mental health during pregnancy, with single pregnant women reporting fewer depressive symptoms than pregnant women in poor relationships. Based on these previous findings it was surprising to find only a small difference in relationship quality between diagnosed and non-diagnosed women in the study. Social desirability bias might possibly be affecting the responses of some of the women. Pregnant women who might be unhappy in their relationships are possibly reluctant to report that since it is more socially desirable to bring a child into a loving relationship.

**Romantic attachment**

The third hypothesis was that pregnant women diagnosed and pregnant women not diagnosed with common mental disorders would have different scores on the Anxious and Avoidant dimensions of adult romantic attachment, with diagnosed women scoring higher on both dimensions. Support for the hypothesis was found; a significant difference was found between the two groups of women, with diagnosed women scoring higher on both dimensions. The difference was moderate for scores on both dimensions, but larger for scores on the Anxious dimension (table 4). These findings are consistent with previous studies reporting an association between romantic attachment and depression, with individuals with an unsecure attachment reporting an increase in depressive symptoms (Cantazaro and Wei, 2010; Wei et al., 2003). Simpson et al. (2003) also found an association between unsecure attachment and an increase in depressive symptoms among women in the pre- and postnatal period. The results of this study suggests that unsecure attachment style might be affecting a part of pregnant women’s ability to form a healthy attachment to their partner, which than has an effect on the women’s mental health during pregnancy.

**Compliance**

The fourth and final hypothesis was that there would be a difference in compliance between women diagnosed and women not diagnosed with common mental disorders during pregnancy, with diagnosed women being more compliant. Results supported the hypothesis; diagnosed women were significantly more compliant than non-diagnosed women although the
difference between the two groups of women was small (table 4). The association between compliance and women’s mental health has not received any attention from researchers so the results could not be compared to previous studies. Compliance has however been associated with unsecure attachment among pregnant women (from the same longitudinal study as the current one) (Gudjonsson et al., 2008) and in this study, the results suggest that compliance might have an effect on women’s mental health during pregnancy. To understand the association better, further studies are necessary.

Limitations and strengths
Strengths of the study include the large sample size and that participants were selected from a general maternity population, not a clinical population. Another strength was limiting the false positives included by relying on both screening and clinical diagnostic interviews conducted by experienced clinicians aware of common symptoms associated with normal pregnancies, which again increases the likelihood of women being diagnosed correctly.

Limitations to this study included the use of self-report scales and the potential response bias associated with that. When women become pregnant the common reaction is to congratulate them as they are expected to be happy during the pregnancy. It can be speculated that the general attitude toward pregnancy might increase the risk of pregnant women responding in a more socially desirable way with regards to their mental health, feelings and relationships. Another limitation was that the reliability of the DASExpression was just short of being acceptable according to the threshold of reliability satisfaction suggested by Nunnally (1978). A possible explanation might be that the subscale only includes four items, with two different response formats (Graham, Liv and Keziorski, 2006).

Conclusion and future research
In order to estimate if the prevalence of Icelandic women diagnosed with common mental disorder during pregnancy is higher or lower than in other countries, the results were compared to previous studies. The problem is that besides major depression, common mental disorders in pregnancy have not received much attention from researchers. The percentage of women in this study diagnosed with depression was similar to the mean percentage reported in a meta-analysis conducted by Gaynes et al. (2005). The fact that 227 participants out of the total 2411 were diagnosed with a mental disorder emphasizes the importance of identifying and being aware of risk factors associated with mental health problems during pregnancy. According to this study, lower educational level and poor financial status as well as previous
or current mental treatment and taking medication to treat depression, anxiety or other mental disorders increased the likelihood of women being diagnosed with mental disorders during pregnancy. Other risk factors included being unmarried or living alone and finally smoking.

Although women diagnosed with common mental disorders perceived less social support from significant others and family than non-diagnosed women, the difference was quite small. The difference was however moderate with regards to support from friends. Pregnant women in Iceland might therefore be placing more emphasis on perceiving support from their friends given that other studies have emphasized support from significant others (Pajulo et al., 2001). Given that Iceland is a small country and family members tend to live relatively close to one another, support from at least some family members or having at least one person to rely on might be more common in Iceland than in other bigger countries. Support from friends might therefore be particularly important. It would be interesting in future research to examine this further.

Differences between diagnosed women and non-diagnosed women with regards to relationship quality and compliance were significant but relatively small. Differences in attachment style were larger, revealing moderate differences. This suggests that pregnant women who experience difficulties in forming healthy and secure attachment to their partner might be more vulnerable when it comes to experiencing mental health problems during pregnancy. Given that unsecure attachment has been associated with both relationship satisfaction and compliance (Banse, 2004; Kane et al., 2002; Gudjonsson et al., 2008), it would be interesting in future research to investigate the relationship between social support, relationship quality, romantic attachment and compliance and how these factors work together and effect the mental health of pregnant women.

This study has provided important information regarding the mental health of pregnant Icelandic women including prevalence of women diagnosed with common mental disorders during pregnancy, risk factors as well as the differences in social support, relationship quality, romantic attachment and compliance between women suffering from mental disorders and women not suffering from mental disorders during pregnancy. Results are informative for health care professionals treating women during pregnancy and promote further research within the field.
References


