Sleep difficulties and the relationship with depression, anxiety and stress in women
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Foreword and acknowledgements

Submitted in partial fulfillment of the requirements of the BSc Psychology degree, Reykjavik University, this thesis is presented in the style of an article for submission to a peer-reviewed journal. I want to thank Edda Ósk Aradóttir for being a great friend and her valuable moral support, Sigríður Ósk Fanndal & Ingunn Henriksen for positive encouragement and moral support. I would also like to thank my parents for their support, babysitting countless times and good proof reading and my brother for always being willing to babysit. Last, but not least, I want to thank my son Gabriel Dominic, who has been my motivation since the beginning of my studies at Reykjavik University and encouraged me with love to do my very best.
Abstract - English
There is a relationship between sleep difficulties and depression, anxiety, and stress that can have detrimental influences on a person’s daily functioning. This study aims to investigate this relationship among women, both mothers and non-mothers. Four hypotheses were tested and all but one were confirmed. The participants were 2475 women with the mean age of 32.5 years, including data from the study Mental Health of Women and Childbirth and a comparison group with female students of Psychology at Reykjavík University in Iceland. The participants answered three psychological scales, the Depression Anxiety Stress Scales (DASS), the Edinburgh Postnatal Depression Scale (EPDS) and the Bergen Insomnia Scale (BIS). The results indicate that women screened with postpartum depression are more likely to suffer from mental distress and sleep difficulties in the future than women that were not screened with postpartum depression. The results also indicate that mothers are not more likely to suffer from mental distress or sleeping difficulties than students that are non-mothers, which could be caused by the ongoing stress students are faced with and irregular sleeping habits. The findings confirm that there is a strong relationship between sleep and mental distress.

Abstract - Icelandic
Það er samband á milli svefnferfiðleika og þunglyndis, kvíða og streitu sem getur haft alvarleg áhrif á daglegt líf einstaklings. Þessi rannsókn er gerð til að kanna þetta samband hjá konum, bæði mæðrum og ekki mæðrum. Fjórar tilgátur voru prófðar og allar nema ein voru staðfestar. Þátttakendur voru 2475 konur með meðalaldurinn 32,5 ár og gögn úr rannsókninni geðheilsa kvenna og barneignir voru notuð ásamt samanburðarhópi sem innihélt kvenkyns nemendur við nám í Sálfreði við Húskólan í Reykjavík á Íslandi. Þátttakendur svörðu þremur sálfreðileguðum kvörðum, Depression Anxiety Stress Scale (DASS), Edinburgh Depression Scale (EPDS) og Bergen Insomnia Scale (BIS). Niðurstöðurnar gefa til kynna að konur sem skimast með fæðingarpunglyndi séu likgreið til að þjáast af andlegum erfiðleikum og svefnvandamálum í framtiðinni en konur sem skimast ekki með fæðingarpunglyndi. Niðurstöðurnar gefa lika til kynna að mæður eru ekki likgreið til að þjáast af andlegum erfiðleikum eða svefnvandamálum en nemendur sem eru ekki mæður, sem geti orsakast af þrálátu stressi sem háskólanemendur finna fyrir, ásamt óreglulegum svefnvenjum og andlegum erfiðleikum.
Sleep difficulties and the relationship with depression, anxiety and stress in women.

Research has shown that 7-13% of women are suffering from Major Depression Disorder every year, it’s one of the top causes of disability in women today (Lýðsdóttir, Ólafsdóttir, & Sigurðsson, 2008). Depression can affect all aspects of everyday life, including daily functioning and sleep and research demonstrates that there is a strong relationship between mood disorders and sleep difficulties, therefore further investigation will be useful (Ford & Cooper-Patrick, 2001).

**Depression**

In the USA, one in five women experience depression during their lifetime, often in the ages 20-40, which is the childbearing age (Muzik, Marcus, Heringhausen, & Flynn, 2009). Around the age of 12 years, gender difference in depression prevalence starts to appear and around the age of 18 years this difference has become the ratio of two females against one male suffering from depression (Davis & Dimidjian, 2012; Lýðsdóttir et al., 2008). Risk factors are: gender, low social support, recent stressful life events and difficulties, premature parental loss, personality, predisposing genetic influences, history of traumatic events and previous history of depression (Kenneth S. Kendler, Kessler, Neale, Heath, & Eaves, 1993).

Major Depressive Disorder (MDD) has nine diagnostic criteria according to the DSM-V an individual needs to have five out of these nine symptoms for more than two weeks to be diagnosed with MDD (American Psychiatric Association & American Psychiatric Association, 2013). These criteria are: depressed mood, decreased interest or pleasure, weight and appetite change (either gain of weight or loss of weight of at least 5% of the person’s body weight within a period of one month), hypersomnia or insomnia nearly every day, feelings of worthlessness or guilt, loss of energy, guilt, loss of concentration and suicidal thoughts. Out of these nine symptoms, the first two, depressed mood and loss of interest,
have to exist and certain functions must be impaired, including social, educational or occupational (American Psychiatric Association & American Psychiatric Association, 2013).

Studies have shown that pregnancy is not a protective factor for depression (Chang, Pien, Duntley, & Macones, 2010). Depression during pregnancy may affect the child’s well-being and it can affect children’s emotional, cognitive, physical and social growth along with their general health (Field, 2010). Risk factors for MDD are temperamental, genetic and physiological and environmental (American Psychiatric Association & American Psychiatric Association, 2013). Research on college students shows that because of hectic schedules, less sleep, worse quality of rest and increased amount of stress, individuals already vulnerable for mental distress are at higher risk of becoming depressed because these environmental factors that come with college (Moo-Estrella, Pérez-Benitez, Solís-Rodríguez, & Arankowsky-Sandoval, 2005).

Anxiety

Depression is often comorbid with anxiety (Lydsdottir et al., 2014). Estimated lifetime prevalence rate of Anxiety Disorders are around 16% universal (Maeng & Milad, 2015). Women are reported to be at twice the higher risk of any anxiety related disorders opposed to men. Anxiety disorders are for example Panic Disorder, Specific Phobia, Agoraphobia, Social Anxiety Disorder, Separation Anxiety Disorder and Generalized Anxiety Disorder (GAD) (Maeng & Milad, 2015).

Generalized Anxiety Disorder (GAD) consists of six symptoms: restlessness, fatigue, lack of concentration, irritability, muscle tension and sleep difficulties (American Psychiatric Association & American Psychiatric Association, 2013). These symptoms need to last for six months in a number of occasions and settings, for example at school, at home or out with friends. Treatment of GAD can be medication, cognitive behavioural therapy or both treatments combined (Davey, 2008).
Sleep

Depressed pregnant women who deal with sleep difficulties often also experience more problems like higher stress levels, anxiety and elevated cortisol level which indicates a relationship not only between sleep and depression, but also between sleep, anxiety and stress (Field et al., 2007). Sleep disorders can be detrimental to mood during waking hours, and as mentioned, fatigue and change of sleep habits, are among symptoms of both depression and anxiety (Davey, 2008). There are a few types of disorders of sleep and one of them is insomnia. Insomnia is characterised by difficulties in falling asleep and waking up often after falling asleep (Carlson, 2014).

Studies have shown that there is a relationship between sleep difficulties and physiological well-being, including coronary artery disease, hypertension, diabetes and depression (Facco, Kramer, Ho, Zee, & Grobman, 2010). Individuals who slept less than five hours per night were three times more likely to have a heart attack (Zee, 2006) and short sleep duration has also been linked to obesity (Facco et al., 2010). Long-lasting sleep deficits have harmful effects on metabolism, cognitive functioning, social relationships, performance in the workplace, quality of life and mental health, and sleep difficulties can also escalate depressed mood (Chang et al., 2010). Loss of sleep does not only cause biological damage but also intensifies distress, it can affect mood regulation and damage memory and attention (Gerhart, Hall, Russ, Canetti, & Hobfoll, 2014). Sleep difficulties have harmful effects on mood, health and quality of life (Zee, 2006). They can both contribute to escalation in medical or psychiatric disorders and they can also be the result. Individuals with sleep difficulties are in greater danger for development of depression within one or two years of the difficulties and monitoring both depression and sleep difficulties is necessary so early interventions are possible (Ford & Cooper-Patrick, 2001).
Like mentioned before, MDD includes symptoms of decreased energy or unexplainable fatigue and sleep difficulties, thus the relationship between sleep and depression can go both ways as insomnia and other sleep difficulties can be a problem for depressed individuals (Field et al., 2007).

Studies have shown that it is common for young and healthy women to have sleep difficulties (Facco et al., 2010; Ford & Cooper-Patrick, 2001) which may increase when women are pregnant (Chang et al., 2010; Facco et al., 2010) and they are more likely to encounter depression, stress and sleep deficiency in the postpartum period (Xiao et al., 2014). Sleep deprivation is also connected with postpartum blues (Lee & Gay, 2004).

**Depression in the perinatal period**

During pregnancy and after giving birth women can experience diverse psychiatric disorders (Paschetta et al., 2014). Women who have never experienced mental disorders can develop them during pregnancy and after childbirth and women who have had mental health problems can relapse during pregnancy and after childbirth. The most common mental illnesses during this time are depression and Anxiety Disorders (Paschetta et al., 2014).

Postpartum depression (PPD) is when a woman is experiencing depressive symptoms within four weeks from giving birth, according to DSM–V–TR, even though researchers in this field believe that the risk of PPD ranges from the second week after giving birth until 18 months after birth (Lýðsdóttir et al., 2008; Norhayati, Nik Hazlina, Asrenee, & Wan Emilin, 2015). Predictors for PPD can be psychosocial factors, a combination of biological and psychosocial factors, genetic factors, hormones, as well as a thyroid dysfunction, but the greatest predictor is previous record of depression or anxiety (Paschetta et al., 2014).

When comparing PPD and depression in non-mothers, Hendrick et al. (2000) found that women with PPD had more anxiety symptoms than a control group of non-mothers which could be because of less sleep and the stress that comes along with taking care of an infant.
Hendrick et al. (2000) also came to the conclusion that depressive symptoms among women with PPD were more severe than in women that had symptoms of depression but no child. However, they do express that research results are conflicting, which could be due to different ways of recruiting women and the different stages of depression in women during the studies (Hendrick et al., 2000). O’Hara et al. (1990) described the same results in their study comparing childbearing and non-childbearing women with depression, the childbearing women had greater symptoms of depression.

The aim of this study was to look further into the relationship between mental distress and sleep difficulties among mothers and non-mothers, and the relationship between PPD and mental distress and sleep difficulties later in life.

Four hypotheses were tested:

1. There is a relationship between sleeping difficulties and mental distress in women, wherein increased sleep difficulties is correlated with more mental distress.

2. Mothers are more likely to have sleeping difficulties and mental distress than non-mothers.

3. Women screened with depression postpartum are more likely to suffer from depression and sleep difficulties later in life than women not screened with depression postpartum.

4. Prior history of depression in mothers (postpartum depression) is a stronger prediction for current depression than current sleep difficulties.

**Method**

**Participants & procedure**

The variables used in this study were symptoms of depression, anxiety and stress, sleeping difficulties, and women, mothers and non-mothers. The design of this study is cross-sectional. The total number of participants were 2475 women with the mean age of 32.5 (ranging from 17-49).
The data came from two studies. Firstly, from the study *Mental health of women and childbirth* (including a web follow-up study) and secondly, from a comparison group from a group of students who were not mothers. In the mental health study, a total of 2408 pregnant women participated. The study started in the fall of 2006 and ended in November 2011. The women were screened during pregnancy at 11 primary care centers in Reykjavik and Akureyri in Iceland. The women were asked to participate and if they agreed they were given questionnaires five times, three times during pregnancy (week 16, 24, and 36 gestation) and twice postpartum (9 and 20 weeks). Two screening instruments were used: The Depression Anxiety and Stress Scales (DASS; Lovibond, 1995) and the Edinburgh Postnatal Depression Scale (EPDS; Cox, Holden, & Sagovsky, 1987). More questionnaires were used in the study, but in this paper only the background information questions were used together with the two screening questionnaires from the original study and two from the web follow-up study. A web follow-up questionnaire with the DASS and the Bergen Insomnia scale (BIS; Pallesen et al., 2008) was sent to all the 2408 women in the spring of 2012. A total of 1156 (48%) women agreed to participate with the mean age of 33.6 (range 17 and 49). No compensation was given to these women for participating.

In the study carried out by the author of the thesis in early 2015, 77 women participated, 10 women who had children were excluded from the study making the comparison group 66 women with the mean age of 22.7 (range 20 and 30). The women were recruited from a participant pool from psychology students in their first or second year at Reykjavik University in Iceland. Compensation for participating was in the form of extra credits in certain courses. Participants in the comparison group were asked to participate in a study and given a consent form along with an information sheet about the study (see Appendix A, p. 22), after agreeing to participate and signing the consent form they were asked to fill in a questionnaire in class containing background questions, the DASS scale and
the BIS scale from the web follow-up study. The study was anonymous and the signed consent forms were put in a separate envelope from the questionnaires to make sure students were given the extra credit without jeopardizing the studies anonymity.

**Measures**

**Depression Anxiety Stress Scale** (DASS; Lovibond, 1995) consists of three scales, 14 items each representing negative emotional symptoms, in each scale (depression, anxiety & stress). Participants rate it on a scale of 0-3 regarding frequency over the past week (see questionnaire in Appendix B, p. 25). The DASS scale has proven to be reliable ($\alpha=0.91$ for Depression scale, $\alpha=0.81$ for the Anxiety scale and $\alpha=0.89$ for the Stress scale) and its validity is good. The translated Icelandic version was used in this study and it also had good reliability ($\alpha=0.81$ for Depression scale, $\alpha=0.90$ for the Anxiety scale, and $\alpha=0.94$ for the Stress scale).

**Edinburgh Postnatal Depression Scale** (EPDS; Cox, Holden, & Sagovsky, 1987) is a 10 items lists developed to measure PPD symptoms. Participants rate their experiences and feelings on a scale of 0-3 regarding frequency over the past week. The reliability (Cronbach’s $\alpha$) of the scale in this study was 0.82 and the scale has been validated both in the prenatal period and postpartum period with good psychometric properties (Lydsdottir, Howard, Olafsdottir, & Sigurdsson, n.d.).

**Bergen Insomnia Scale** (BIS; Pallesen et al., 2008) consists of six questions about sleep difficulties that the participants rated on a scale between from 0 and 7, with regards to the amount of sleep difficulty incidents over the week, during the past month. An example of a question: “During the past month, how many days a week has it taken you more than 30 minutes to fall asleep after the light was switched off?” (See the scale in in English and Icelandic, Appendix B, p. 27-29). The scale’s convergent validity is sufficient, good
discriminant validity and the reliability of the scale is also good (Lydsdottir et al., n.d.). The reliability of the Icelandic translation of the scale used in this study, Cronbach’s $\alpha$, was 0.81.

**Background questions:** Background questions were asked in both samples. Those included questions about age, marital status, amount of children in the home, education and employment.

**Statistical analysis:** Version 22 of the Statistical Package for Social Sciences (SPSS) was used for the statistical analysis. Descriptive statistics were used to describe the means of the scales used in study. Cronbach’s alpha was calculated to determine the reliability of the scales. Independent Sample t-tests were computed to address the differences between the groups on the psychological scales and Pearson correlation coefficients were calculated to address the relationships between the scales. In order to find out how much prior history of depression (postpartum depression) and current sleep difficulties contributed to the variance in current depression hierarchical linear regression was carried out.

**Results**

The mean age of participants in the *Mental health of women and childbirth* was 28.8 (SD=5.2, age range=17-47), 41 women did not specify their age. The mean age of participants in the web follow-up study was 33.36 (SD=5.2, age range=19-49), 7 women did not specify their age. Mean age in comparison group was 22.79 (SD=2.4, age range=20-30).

To test the first hypothesis, that there is a relationship between sleeping difficulties and mental distress in women, independent T-tests were carried out between those scoring over and under cut-off on all the three DASS scales against the BIS means. The first pair of groups was the DASS-Depression, split into two groups (one and two according to cut-off points (Lovibond, 1995)). Group one (under cut-off, $N=902$) had a mean of 13.0 (SD 8.1) and group two (over cut-off, $N=138$) had a mean of 19.6 (SD 9.1) making the difference significant ($t$-value=8.68, $p<0.001$). The second pair of groups was the DASS-Anxiety, split
into two groups (one and two according to cut-off points). Group one (under cut-off, N=942) had a mean of 12.7 (SD 7.9) and group two (over cut-off, N=110) had a mean of 22.7 (SD 8.4) making the difference significant (t-value 12.5, p<0.001). The third and last pair of groups was the DASS- Stress, split into two groups (one and two, according to cut-off points). Group one (under cut-off, N=912) had a mean of 12.7 (SD 8.0) and group two (over cut-off, N=146) had a mean of 21.1 (SD 8.8) making the difference significant (t-value 11.6, p<0.001).

Pearson’s correlations were calculated between the DASS scales, the BIS and the EDPS. As expected, the DASS scales are highly correlated with each other, but what is of importance is that the BIS correlates with all the mental distress scales as can been seen in Table 1. The BIS has the highest correlation with the DASS-Stress scale with a moderate correlation to DASS-Depression and DASS-Anxiety scales, and less with the EDPS scale.

Table 1

**Correlations between the DASS scales, EPDS and the BIS.**

<table>
<thead>
<tr>
<th></th>
<th>DASS-Stress</th>
<th>DASS-Anxiety</th>
<th>DASS-Depression</th>
<th>BIS</th>
<th>EPDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>DASS-Stress</td>
<td>1</td>
<td>.75*</td>
<td>.79*</td>
<td>.45*</td>
<td>.38*</td>
</tr>
<tr>
<td>DASS-Anxiety</td>
<td>1</td>
<td>.72*</td>
<td>.40*</td>
<td>.36*</td>
<td></td>
</tr>
<tr>
<td>DASS-Depression</td>
<td>1</td>
<td>.40*</td>
<td>.39*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIS</td>
<td>1</td>
<td>.31*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EPDS</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note. *p<0.001; BIS:Bergen Insomnia scale, EPDS:Edinburgh postpartum depression scale.*

To test the second hypothesis, that mothers are more likely to have more sleeping difficulties and mental distress than non-mothers, means from the two groups, mothers and non-mothers were compared on the DASS scales and the BIS scale. As shown in Table 2, the results showed a significant difference between the two groups on the DASS-Anxiety scale (mothers 5.1 and non-mothers 6.7), the DASS-Stress scale (mothers 8.5 and non-mothers
11.6) and the BIS scale (mothers 12.8 and non-mothers 15.1). The difference was not significant on the DASS-Depression scale. The difference is contrary to the hypothesis.

To examine further the difference between the two groups, independent t-tests were carried out by limiting the sample of mothers to the age range of 20 to 30 because of the great difference in average age between the two groups (22 years vs. 33 years, respectively, N between 283-345 depending on the four scales) and non-mothers (N 63-66 depending on the four scales). The mean results from the group of mothers in the same age are nearly identical to the group of mothers of all age as Table 2 shows.

Table 2

Means and standard deviations for all the scales and all the groups and T-values of the differences between the scales.

<table>
<thead>
<tr>
<th>Scales</th>
<th>1 Mothers Mean (SD, N)</th>
<th>2 Mothers same age Mean (SD, N)</th>
<th>3 Non-Mothers Mean (SD, N)</th>
<th>T-value 1 and 3</th>
<th>T-value 2 and 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>DASS-D</td>
<td>5.1 (6.7, 976)</td>
<td>5.5 (7.1, 284)</td>
<td>6.7 (7.1, 64)</td>
<td>1.9</td>
<td>1.3</td>
</tr>
<tr>
<td>DASS-A</td>
<td>3.1 (4.9, 989)</td>
<td>3.7 (5.6, 283)</td>
<td>5.5 (4.6, 63)</td>
<td>3.7***</td>
<td>2.4*</td>
</tr>
<tr>
<td>DASS-S</td>
<td>8.5 (7.5, 993)</td>
<td>8.6 (8.3, 287)</td>
<td>11.6 (7.5, 65)</td>
<td>3.2**</td>
<td>2.6**</td>
</tr>
<tr>
<td>BIS</td>
<td>12.8 (9.1, 1156)</td>
<td>12.8 (9.4, 345)</td>
<td>15.1 (8.2, 66)</td>
<td>2.0*</td>
<td>1.9</td>
</tr>
<tr>
<td>EPDSa</td>
<td>4.6 (3.9, 682)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. *p<0.05, **p<0.01, ***p<0.001. a.The EPDS scale was not administered to the comparison group. 1.Mothers of all ages. 2.Mothers in the age range of 20-30. 3.Non-mothers.

To test the third hypotheses, that women screened with depression at postpartum are more likely to suffer from depression and sleep difficulties later in life, an independent t-test was carried out, between two groups, those who scored lower than cut-off (>12, the cut-off used to determine if women are showing symptoms of post-partum depression (Cox et al., 1987)) on the EDPS at nine weeks post-partum and those who scored higher than the cut-off.
Those who scored under cut-off on the EDPS had a mean score of 4.5 (SD=5.8) on the DASS-Depression scale in the web follow up study, but those who scored at and above cut-off point scored 12.2 (SD = 12) on the DASS-Depression scale. The difference was significant (t-value=7, p<0.001). Those who scored under cut-off had a mean of 12.8 (SD=8.4) on the BIS in the web follow-up study, but those who scored at or above cut-off point scored 20.86 (SD=10.4) on the BIS. The difference was significant (t-value=5.90, p<0.001). These differences confirmed the third hypotheses.

Table 3

*Linear regressions with the DASS-Depression Scale as the dependent measure.*

<table>
<thead>
<tr>
<th>Variables</th>
<th>B</th>
<th>Beta</th>
<th>T-value</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIS</td>
<td>0.27</td>
<td>0.34</td>
<td>8.40***</td>
<td>0.20-0.33</td>
</tr>
<tr>
<td>R²=0.12; R²-Change= 0.12; ANOVA (F-Change)=70.52***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Block 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIS</td>
<td>0.19</td>
<td>0.25</td>
<td>6.07***</td>
<td>0.13-0.26</td>
</tr>
<tr>
<td>EDPS</td>
<td>0.47</td>
<td>0.29</td>
<td>7.02***</td>
<td>0.34-0.60</td>
</tr>
<tr>
<td>R²=0.19; R²-Change=0.08; ANOVA (F-Change)=49.27***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note. *p<0.05, **p<0.01, ***p<0.001

To test the fourth hypotheses that prior history of depression (postpartum depression) is a stronger prediction for current depression than current sleep difficulties a linear regression model was tested. The model had three blocks and DASS-Depression was the dependent variable. The first block had the BIS, in the second block the EDPS was added in and in the third block the DASS-Stress and the DASS-Anxiety scales were added. Table 3 shows that alone the BIS explains 12% of the variance in the DASS-Depression. Adding the EPDS (block 2) adds a further 8% of the variance. The whole regression model explains 19% of the variance in the DASS-Depression.
Discussion

The aim of this paper was to examine the relationship between sleep difficulties and mental distress experienced by women and furthermore to investigate if sleep difficulties are possibly a causal factor in this respect and also if becoming a mother has a negative influence on sleep quality and mental distress.

The first hypothesis, stating that increased sleep difficulties in women are correlated with more mental distress, was confirmed. Women showing more mental distress symptoms had more sleeping difficulties showing a relationship between the two. This is in line with research that shows that those suffering from sleeping difficulties are at more risk of evolving mood disorders (Ford & Cooper-Patrick, 2001).

The second hypothesis, that mothers would be more likely to have more sleeping difficulties and mental distress than non-mothers was not confirmed. The causes of these results could be multiple. The group of non-mothers was a much smaller sample than the group of mothers. The non-mothers group also only included college students and research indicates that the environmental factors of being a college student, for example the stress of being in college, can cause depression (Moo-Estrella et al., 2005). The sleep habits of college students can also suffer due to unbalanced schedules, reduced sleep quality and less hours dedicated to sleep.

The third hypothesis, that women screened with depression postpartum are more likely than women not screened with depression postpartum to suffer from depression and sleep difficulties later in life, was confirmed. Studies show that history of prior depression is a risk factor for future depression, therefore having postpartum depression increases the risk of later developing depression (Kendler et al., 1993). Depression following pregnancy was not classified as postpartum depression in DSM–V, but is classified as a Unspecified Depressive Disorder a peripartum onset, which shows that PPD is as much of a risk factor as
MDD (American Psychiatric Association & American Psychiatric Association, 2013). As the first hypothesis showed, there is a relationship between sleep difficulties and mental distress, sleep is a predicting factor for depression and depression is also a predicting factor for future depression.

The forth hypothesis, that prior history of depression in mothers (postpartum depression) is a stronger predictor for current depression than current sleep difficulties was confirmed and is also supported by the third hypothesis showing that prior depression is a predictor of future depression. While both sleep and depression are predicting factors for future depression, according to research, previous depression is considered one of the top four strongest risk factors (Kendler et al., 1993).

There are a few limitations of this study. In the non-mothers group, the sample size was too small and too limited, i.e. only university students. When future research is to be done with the mother’s data, a larger sample of non-mothers would be ideal to compare further sleep habits and mental distress. The non-mothers were all college students, which make their daily life often hectic and stressful, which could easily account for both sleep difficulties and mental distress. Another limitation of the data is that a part of it was from a web questionnaire and web questionnaires usually have a large dropout rate. The third limitation is using the EDPS during pregnancy. As reported by Lydsdottir et al. (2014) using the EPDS during pregnancy does detect women who do suffer from depression, but will also recognize women who are suffering from other mental disorders, some more serious than depression, increases the possibility of high false positives. The main strength of this study is that the data is from a longitudinal research.

The main conclusion of this study is that the relationship between sleep and depression is a strong one like previous research indicates (Ford & Cooper-Patrick, 2001; Zee, 2006). Because there was no difference between the mothers and the non-mothers, it’s
apparent that mental distress and sleep difficulties are common among students and that is something that can be better looked at in future research. Sleep plays an important role in the mental and physical wellbeing of the human body and it’s important that more focus is put into improving sleeping habits, both among mothers and students. Studies of this nature point out the importance of a good night sleep and those who are suffering from sleep difficulties need to be under surveillance for future depression. The importance of sleep does not change the fact that depression is the greater risk factor than sleep and whether it is postpartum depression or major depression disorder, past history of mental distress needs to be considered and dealt with.
References


http://doi.org/10.1111/j.1468-2850.2012.01273.x


http://doi.org/10.1097/AOG.0b013e3181c4f8ec


http://doi.org/10.1016/j.infbeh.2009.10.005


SLEEP DIFFICULTIES, DEPRESSION, ANXIETY AND STRESS

Appendix A

Upplýsingar fyrir þáttakendur

1 Titill á verkefni: Tengsl milli svefnraskana og þunglyndi í mæðrum og ekki mæðrum.

2 Boðið
Þér er boðið að taka þátt í rannsókn. Áður en þú ákveður þig er mikilvægt að þú skiljir af hverju er verið að framkvæma þessa rannsókn og í hverju hún felst. Þetta Upplýsingablað þáttakanda segir þér tilganginn, áhættunar og kosti þess að taka þátt í þessari rannsókn. Ef þú samþykktir að taka þátt verður þú beðin um að skrifa undir Upplýst samþykki. Ef það er eitt hvað sem þú eftir ekki með á hreinu er minnsta mál að útakýra það fyrir þér. Endilega taktu eins mikinn tíma og þú þarf til að lesa þessar upplýsingar. Þú ættir aðeins að samþykkið að taka þátt í þessari rannsókn ef þér líður eins og þú skiljir hvers er ætlast til af þér, og þú hefur fengið nógan tíma til að hugsa þig um. Takk fyrir að lesa þetta

3 Tilgangur rannsóknar
Þessi rannsókn er um þunglyndi, kvíða og stress, svefn truflanir og mæður. Tilgangur rannsóknaðin er að finna út hvort að það sé mismunur á þessum svæðum eftir því sem konur eru mæður eða ekki. Þú eftir beðin um að taka þátt til að bera saman við þessum hón af konum sem hafa eignast börn, til að sjá muninn það um milli mæðra og ekki mæðra. Allir kvenkyns nemendur á þýrsta og áður ári vorur valdir til samanburða. Þessi rannsókn er nafnlaus og það verður engin leið fyrir neinn um að finna út hvort það ðanum er ætlast til af það mæða og þú skiljir því sem konur eru mæður eða ekki.

4 Að taka þátt, hvað felst í því?
Þú þarf ekki að taka þátt í þessari rannsókn, þú ræður því sjálf hvort þú takir þátt eða ekki. Ef þú ákveður að taka þátt verður þú látin fá þetta Upplýsingablað þáttakanda til að eiga og verður beðin um að skrifa undir Upplýst samþykki. Ef þú ákveður að taka þátt mátt þú mismunnaði við hverju sem er án þess að gefa ástæðu. Ákvörðun að hætt við eða sú ákvörðun að taka ekki átt, breytir engu um þín réttindin. Ef þú tekur þátt færð þú spurningalista til að fylla út, með 54 spurningum sem tekur u.h.b. 10-12 mínútur og þegar þú eftir þuður engin þrunaði það þátttöku þinni lokið. Það verður ekki þörf fyrir meiri þátttöku af þinnar hendi.

Ef þú hefur eftir þessari spurningar eða áhyggjur mátt þú hafa samband við mig, Ásrúnu Á. Jónsdóttir, í netfangið asrun12@ru.is

Ef þú hefur eftir þessari áhyggjur varðandi þessa rannsókn og vilt hafa samband við einhver á trúnaði, mátt þú hafa samband við stjórn sálfræðideildar Háskóla Reykjavíkur.
CONSENT FORM

Participant Identification No.: ____________________________

Title of Project: __________________________________________

Name of Researcher: ______________________________________

Please initial box

1. I confirm that I have read the information sheet for the above study and have had the opportunity to ask questions.

2. I am satisfied that I understand the information provided and have had enough time to consider the information.

3. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, and without my legal rights being affected.

4. I agree to take part in the above study.

_________________________  ___________  ________________
Name of Participant  Date  Signature

_________________________  ___________  ________________
Researcher  Date  Signature

1 copy for participant; 1 copy for researcher; 1 copy to be kept with research notes
Appendix B

Grunnspurningar

1. Hver er aldur þinn?
   ___ ára

2. Hver er hjúskaparstaða þín?
   Gift/staðfest sambúð
   Í sambúð
   Einhleyp
   Fráskilin
   Ekkja

3. Hver er fjöldi barna á heimilinu?
   Vinsamlegast skrifaðu svæð (svör) hér:
   Það eru engin börn á heimlin
   Þín eigin, hve mörg? ______
   Ónnur, hve mörg? ______

4. Merktu við hæstu gráðu sem þú hefur lokjöð?
   Hætti í skyldunámi
   Skyldunámi (t.d. grunnskóli, landsprófi, gagnfræðaprófi)
   Starfsmáni, íoðnámi, böklegu framhaldsnámi (t.d. Stúdentsprófi, samvinnuprófi, vonlunaprófi, vélfræðingar, skipstjórnarnám).
   Sérhólanámi á eða við háskólastig (t.d. íoðfræði- eða tækninámí).
   Grunnámi á húskólastígri (B.Sc/B.A/B.Ed eða samtærilégri gráðu)
   Framhaldsnámi á húskólastígri (5 ára eða lengra húskólanámí)
   Annað

5. Hvert er aðalstarf þitt?
   Á ekki við, er ekki í vinnu
   Ósérhæft starf, verkamannavinna (t.d. ræstingarstarf, fiskvinnumstarf)
   Afgreiðslu- og þjónustustarf (t.d. afreiðslustarf, ummönunarstarf (ófaglæðir))
   Íoðnáarmaður (t.d. hársnyrtir)
   Almenn skrifstofustörf (t.d. gjaldkeri, innheima, símavörður)
   Sérhæft starf eða tæknistarf sem krefst sérmenntunar (t.d. lögreglumaður, sjúkraliði)
   Sérhæft starf sem krefst húskólagráðu (t.d. lögreglumaður, læknir, húkrunarfræðingur, kennari)
   Stjórnunarstarf (fyrirtækjastjórnandi, deildarstjóri í fyrirtæki, hátt settur embættismaður)
   Annað
**DASS – spurningalisti um líðan**

Lestu hverju fullyröingu og dragðu hring um tölu 0, 1, 2 eða 3 sem segir til um hve vel hver fullyröing átti við í þinu tilviki síðustu víkuna. Tað eru engin rétt eða röng svör. Eyddu ekki of miklum tíma í að velta fyrir þér hverri fullyröingu.

**Stigagjöf:**

0 = Átti alls ekki við mig  
1 = Átti við mig að einhverju leyti eða stundum  
2 = Átt viðuvert vel við mig eða drjúgan hluta vikunnar  
3 = Átt mjög vel við mig eða mest allan tímann

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
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<th></th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Ég komst í uppnám yfir hreinum smámunum.</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>Ég fann fyrir munñurrki.</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Ég virtist alls ekki geta fundið fyrir neinum góðum tilfinningum.</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>Ég átti í erfðoleikum með að anda (t.d. allt of hröð óndun, mæði án líkamlegrar áreynslu).</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>Ég gat ekki byrjað á neinu.</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>Ég hafði tilheiningingu til að bregðast of harkalega við aðstæðum.</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>Mér fannst ég vera óstyrk(ur) (t.d. að fæturnir væru að gefa sig).</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>8</td>
<td>Mér fannst erfitt að slappa af.</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>9</td>
<td>Ég lenti í aðstæðum sem gerðu mig svo kvíðna/kvíðinn að mér létt stórum þegar þeim lauk.</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>10</td>
<td>Mér fannst ég ekki geta hlakkað til neins.</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>11</td>
<td>Ég komst auðveldlega í uppnám.</td>
<td>0</td>
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<td>2</td>
</tr>
<tr>
<td>12</td>
<td>Mér fannst ég eyða mikilli andlegri orku.</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>13</td>
<td>Ég var hrygg/hryggur og þunglynd(ur).</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>14</td>
<td>Ég varð ópolinmóð(ur) ef eithvæði létt á sér standa (t.d. lyftur, umferðarljós, ég látn(n) biða).</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>15</td>
<td>Mér fannst það ætlæði að líða yfir mig.</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>16</td>
<td>Mér fannst ég hafa misst áhuga á næstum öllu.</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>17</td>
<td>Mér fannst ég ekki vera mikils virði sem manneskja.</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>18</td>
<td>Mér fannst ég frekar hörundsár.</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>19</td>
<td>Ég svitnaði töluvvert (t.d. sviti í lófum) þó það væri ekki heitt og ég hafi ekki reynt miðið á mig.</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>20</td>
<td>Ég fann fyrir ótta án nokkurra skynsamlegar ástæðu.</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>21</td>
<td>Mér fannst lífið varla þess virði að lífa því.</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Page</td>
<td>Sentence</td>
<td>Difficulty</td>
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<td>----------</td>
<td>------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Mér fannst erfitt að ná mér niður.</td>
<td>0 1 2 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Ég átti erfitt með að kynjja.</td>
<td>0 1 2 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Ég virtist ekki geta haft neina ánægju af því sem ég var að gera.</td>
<td>0 1 2 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Ég varð virði ekki reynt á mig (t.d. hraðari hjartsláttur, hjartað sleppti úr slagi).</td>
<td>0 1 2 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Ég var dapur/döpur og niðurdregin(n).</td>
<td>0 1 2 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Mér fannst ég mjög pirruð/pirraður.</td>
<td>0 1 2 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Mér fannst ég nánast gripin(n) skelfingu.</td>
<td>0 1 2 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>Mér fannst erfitt að róa mig eftir að eitthvað kom mér í uppnám.</td>
<td>0 1 2 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Ég var hrædd(ur) um að „klikka á“ smávægilegu verki sem ég var ekki kunnug(ur).</td>
<td>0 1 2 3</td>
<td></td>
<td></td>
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<tr>
<td>31</td>
<td>Ég gat ekki fengið brennandi áhuga á neinu.</td>
<td>0 1 2 3</td>
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<tr>
<td>32</td>
<td>Ég átti erfitt með að umbera truflanir á því sem ég var að gera.</td>
<td>0 1 2 3</td>
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</tr>
<tr>
<td>33</td>
<td>Ég var spennt(ur) á taugum.</td>
<td>0 1 2 3</td>
<td></td>
<td></td>
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<tr>
<td>34</td>
<td>Mér fannst ég nánast einskis virði.</td>
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<td></td>
<td></td>
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<tr>
<td>35</td>
<td>Ég þoldi ekki þegar eitthvað kom í veg fyrir að ég héldi áfram við það sem ég var að gera.</td>
<td>0 1 2 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>Ég var óttaslegin(n).</td>
<td>0 1 2 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>Ég sá ekkert í framtíðinni sem gaf mér von.</td>
<td>0 1 2 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>Mér fannst lífið vera tilgangslaut.</td>
<td>0 1 2 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>39</td>
<td>Ég var ergileg(ur).</td>
<td>0 1 2 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>Ég hafði áhyggjur af aðstæðum þar sem ég fengi hraðslukast (panik) og gerði mig að fífli.</td>
<td>0 1 2 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>41</td>
<td>Ég fann fyrir skjalfta (t.d. í höndum).</td>
<td>0 1 2 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>42</td>
<td>Mér fannst erfitt að hleypa í mig kraftr til að gera hluti.</td>
<td>0 1 2 3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Svefn og Syfja**

Í þessum spurningalista ertu beðin um að svara sex spurningum um svefn og syfju.

Vinsamlegast hakaðu við þá tölu (fjöldi daga í viku) sem best á við þig. 0 er enginn dagur í viku og 7 eru allir dagar vikunnar.

Ef það hefur tekið þig 30 mínútur eða lengur að sofna eftir að ljósin eru slökkt, að meðaltali 3 daga í viku.

Síðastliðinn mánuð, þá velurðu 3 í fyrstu spurningunni.

1. Síðastliðinn mánuð, hversu marga daga í viku hefur það tekið þig 30 eða lengur að sofna eftir að ljósin eru slökkt á kvöldin?

Vinsamlegast veldu aðeins eitt af eftirfarandi:

0
1
2
3
4
5
6
7

2. Síðastliðinn mánuð, hversu marga daga í viku hefur þú verið vakandi í 30 mínútur eða lengur á milli þess sem þú ert sofandi?

Vinsamlegast veldu aðeins eitt af eftirfarandi:

0
1
2
3
4
5
6
7

3. Síðastliðinn mánuð, hversu marga daga í viku hefur þú vaknað meira en 30 mínútum fyrir en þú ætlaðir þér, án þess að ná að sofna aftur?

Vinsamlegast veldu aðeins eitt af eftirfarandi:

0
1
2
3
4
5
6
7

4. Síðastliðinn mánuð, hversu marga daga í viku hefur þér ekki fundist þú vera úthvild þegar þú vaknar á morgnanna?
Vinsamlegast veldu aðeins eitt af eftirfarandi:
0
1
2
3
4
5
6
7

5. Síðastliðinn mánuð, hversu marga daga í viku hefur þú verið svo þreytt að það hefur haft neikvæð áhrif á starf/nám og einkalíf þitt?
Vinsamlegast veldu aðeins eitt af eftirfarandi:
0
1
2
3
4
5
6
7

6. Síðastliðinn mánuð, hversu marga daga í viku hefur þú verið óánægð með svefninn þínn?
Vinsamlegast veldu aðeins eitt af eftirfarandi:
0
1
2
3
4
5
6
7
The Bergen Insomnia Scale (BIS)

During the past month, how many days a week;

1. Has it taken you more than 30 minutes to fall asleep after the light was switched off?

2. Have you been awake for more than 30 minutes between periods of sleep?

3. Have you awakened more than 30 minutes earlier than you wished without managing to fall asleep again?

4. Have you felt that you have not had enough rest after waking up?

5. Have you been so sleepy/tired that it has affected you at school/work or in your private life?

6. Have you been dissatisfied with your sleep?
Hér með staðfestist að Persónuvernd hefur mötteksð tilkynningu í yður nafni um vinnslu persónuupplýsinga. Tilkynningin er nr. S7266/2015 og fylgir afrit hennar hjálaði.

Vakinn er athygli á því að tilkynningin hefur verið birt á heimasiðu stofnunarinnar.
Tekst skal fram að með möttökum og bítringum tilkynninga hefur engin afstaða verið tekia af hálfa Persónuverndar til efnis þetta.

Vörðungarflést,

Teitur Skúlason

Hjál.: - Tilkynning nr. S7266/2015 um vinnslu persónuupplýsinga.
Kynningarbréf um visindarannsókina
Geðehilsa kvenna og barneignir

Meginnmarkmið rannsóknar eru að fá upplýsingar um hvernig best er að greina þunglyndi og kviða á meðgöngu og eftir fædningu, meta þórrina fyrir þjónustu og hvernig best sé að mæta henni af hálfu heilsugasendurnar og geðheilbrigðið. Þáttaka þess er mikilvægi framtáglega til þróunar þekkingar á geðheilbrigðið í Íslandi og sumu færslu rannsóknar á færslu barneignir á meðgöngu og eftir fædningu.
Rannmakendur telja enga áhættu stafla af þátttöku í rannsókninni aðra en hugnaðleg álag við að svara spurningum og spurningalítilum um sjálfin sig. Þátttakendur eru hvittir til að látta víta ef þeim finnst þátttakan óþyngileg og er fjárald að hættu við þátttöku hvenær sem er. Einnig geta þeir nefnt að svara einstaka spurningum eða spurningalítilum. Það mun ekki hafa öðurr af þeim heilbrigðisþjónusta sem þó farð að heilsugestuðleða eða á Landspítala-háskóla sjúkráðhúsi. Ef koma greintist með allvælendur einkenni þunglyndis og öðru víkenda mun rannmakendur í samræmi við hana hafa samhrend við henar heilsugestuðleð sem þá í huga að finna viðegandi írrední.

Nófin þátttakenda og kennitala mun ekki koma fram á rannsóknargögnnum heldur verða þau númerð og á því ævíuddarverð því því þó þegar óþigrationnir þátttakenda heita fullrar nafnleynir og þátttakendir og á öðrum á rannsókninni stendur verða gögninn varðviti í læstum skjalaskáp á geðsviði Landspítala-háskólasjúkráðhúss, sem einungis um þóttum rannsókninnar hafa uppskráð og þegar henni er lokja verður gögnnum eitt. Rannsóknin hefur verið þóttum tölur ef þóttum Persónuvernd og Visindasjónum ef her þóttum þeir verða leyti til henar.

Þau aðstæð sem könnuð verða í viðslurnum og með sálfræðilegum prófum eru: Geðraknari (einkum þunglyndis og kvíðs), líftvötnum, lífsinsverkum, reykningar, lífligaði, dýfti og erfjölfteiki, upplýsingar um meðhöngu og fæðingd, þáttlagar staðningir, hvernig tekstur er á við vandamál, gæði tengsla og námna sambanda.

Ábyrgðarmaður rannsóknarinnar er Jón Fröðrik Sigurðsson, forstáttudúralfræðingur á geðsviði Landspítala-háskólasjúkráðhúss, sími 543-4060, tölvunetning: jofsig@landspitali.is. Áhrir rannmakendur frá geðsviði Landspítala-háskólasjúkráðhúss eru Hallfríð Öflaðottir, yfirleikinar, Pétur Tyrifjörguóu og Linda Írða Lýðsdóttir sálfræðingur; frá Miðþotó Meðravendur eru Dr.med. Ánnar Hauksson, yfirleikinar; frá Heilsugestuðleði Grafarvegs er Sigurður Brynja Sigurðardóttir, hjóknarforstæði; frá Háskóla Íslands er Marga Thome professor; frá Miðþotó heilsuverndar banna eru Sessela Guðmundsdóttir, svöðstaþjóri Ung- og smábaranansvöð og Gyda Sigurðardóttir, svöðstaþjóri Bróna- og hegðanansvöð; og Sigurður Sla Jónsdóttir lífsinsmiður og Urðar Njarðvik, þjálfstett starfandi sálfræðingur.

Undirskrift ábyrgðarmaðar rannsóknarinnar

Undirskrift rannmakenda

Ef það hefur spurningar um rétt þinn sem þátttakandi í þessari visindarannsókn eða víl hættu þátttöku í rannsókninni getur þú snuð þér til Visindasjónum ef þú þurfti þér til Visindasjónum, Vegmúli 3, 108 Reykjavík. Sími: 551 7100, fax: 551 1444, vefsíða: www.visindasjona.is