



BSc in Psychology
Department of Psychology

How perceived support, coping strategies, and interpregnancy interval affect mental health in women with a history of a miscarriage

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Foreword

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.

This thesis was completed in the Spring of 2021 and may therefore have been significantly impacted by the COVID-19 pandemic. The thesis and its findings should be viewed in light of that.

Abstract

Previous studies indicate that pregnant women are at a greater risk for mental health problems when they have a history of miscarriage. The aim of the study was to see if having a history of miscarriage affected pregnant women's mental health and to examine how social support, coping strategies, and interpregnancy interval contributed to depression, anxiety, and stress among these women. A sample of 650 pregnant women were asked if they had a history of miscarriage during a clinical interview. DASS scores were compared between women with a history of miscarriage and women without such history. Women with a history of miscarriage were more depressed at week 25 and 36, more anxious at week 16 and more stressed at week 25 of pregnancy. A longer interpregnancy interval did not contribute to fewer symptoms of depression, anxiety, and stress among pregnant women with a history of miscarriage. Avoidant coping increased depression, anxiety and stress at week 16, whereas, approach coping decreased depression at week 16, not stress nor anxiety, among pregnant women with a history of miscarriage. The study underlines the importance of support because perceiving high social support had a clear associations with lower DASS scores at all measurement points.

Keywords: miscarriage, pregnancy, perceived support, coping, interpregnancy interval

Útdráttur

Fyrri rannsóknir benda til þess að konur sem eiga sögu um fósturlát séu í aukinni hættu á andlegri vanlíðan á næstu meðgöngu. Markmið rannsóknarinnar var að skoða hvort saga um fósturlát hefði neikvæð áhrif á andlega líðan þungaðra kvenna og hvort félagslegur stuðningur, bjargráð og tími liðinn frá fósturláti spili þar hlutverk. Um 650 konur svöruðu spurningum um fósturlát í klínísku viðtali. Konur með sögu um missi voru bornar saman við þær sem áttu ekki slíka sögu út frá DASS sjálfsmatskvarðanum. Niðurstöður leiddu í ljós að konur með sögu um fósturlát upplifðu fleiri einkenni þunglyndis á 25. og 36. viku, fleiri einkenni kvíða á 16. viku og fleiri einkenni streitu á 25. viku meðgöngu borið saman við konur sem áttu ekki sögu um fósturlát. Það dró ekki úr þunglyndi, kvíða né streitu eftir því sem lengri tími hafði liðið frá fósturláti. Að nota fælnistengd bjargráð (e. *avoidant coping*) jók þunglyndi, kvíða og streitu kvenna á 16 viku meðgöngu en nálgunartengd bjargráð (e. *approach coping*) drógu aðeins úr þunglyndi á 16 viku, ekki kvíða né streitu. Rannsóknin undirstrikar þó helst mikilvægi félagslegs stuðnings en það að upplifða mikinn félagslegan stuðning hafði jákvæð áhrif á líðan kvenna með sögu um fósturlát.

Lykilorð: fósturlát, meðganga, félagslegur stuðningur, bjargráð

How perceived support, coping strategies, and interpregnancy interval affect mental health in women with a history of a miscarriage

Approximately 20% of all confirmed pregnancies end in miscarriage by unknown causes in Iceland (Yfirlæknir kvenlækninga, 2018). Miscarriage is defined by the time of occurrence, and it is called early miscarriage when the loss occurs in the first 12 weeks, which is the most common type of miscarriage (Yfirlæknir kvenlækninga, 2018). It is referred to as late miscarriage when it occurs between week 13-22 and stillbirth after 22-24 weeks (Centers for Disease Control and Prevention, 2020; Miscarriage Association, n.d.). A pregnancy often symbolizes a future baby, and the beginning of motherhood and when it ends with a miscarriage it can affect women profoundly (Shreffler et al., 2011). Grief is a typical response to miscarriage (DeMontigny et al., 2017) along with other psychological adversities like depression, anxiety (Cumming et al., 2007), and stress (Shreffler et al., 2011). These adversities can be magnified if commitment or attachment has been made towards the fetus or if the role of motherhood is valued highly (Shreffler et al., 2011). Nonetheless, most women who miscarry will become pregnant again. However, the psychological consequences of the miscarriage can extend to the subsequent pregnancy (McCarthy et al., 2015), which can cause the mother to be hypervigilant and anxious about miscarrying again (Cote-Arsenault & Donato, 2011).

Chojenta et al. (2014) found that women with a history of miscarriage were more likely to have mental health problems than women without such history, the mental health problems included feeling depressed, anxious, and stressed. Interestingly, their results did not apply to the postpartum period, which may imply that these feelings diminish later in the pregnancy or after birth. This is supported by Gong et al.'s (2013) study where women with a history of miscarriage were at risk for anxiety and depression in the first trimester (1-12 weeks), but it declined in the second trimester (14-27 weeks). Their results also displayed the

importance of an interpregnancy interval which refers to the time in between pregnancies. Within six months from the miscarriage, women who got pregnant reported more anxiety and depressive symptoms than women with a longer interpregnancy interval (Gong et al., 2013). This is in line with a study by DeMontigny et al. (2017) where women who had a miscarriage in the past six months had higher depression scores than those who miscarried in between the previous seven months and two years.

Other factors can also influence women's mental health during pregnancy after miscarriage. One prevailing contributor is perceived support, but a high-quality relationship with a significant other has been linked to less anxiety, depression, and stress and is a decisive factor of resilience for bereaved women after a miscarriage (Scheidt et al., 2012). According to Duman & Kocak (2013), pregnant women suffered less anxiety if they had higher support from their significant other. Support from friends and family did not affect anxiety as much as support from the significant other, but overall social support was associated with lower anxiety levels. Similar results were put forward by Hutti et al. (2015), where women with a history of miscarriage showed more intense grief during the next pregnancy if the quality of the relationship with their partner was poor.

Having a miscarriage is considered a stressful event, so it is normal for women to seek ways to cope (Andersson et al., 2011). Several models of coping have been established, but some have focused on the distinction between approach and avoidant coping strategies (Eisenberg et al., 2011). Avoidant coping strategies include withdrawal or denial of emotions, whereas approach coping strategies include confronting emotional responses to a stressor (Suls & Fletcher, 1985; Taylor & Stanton, 2007). Avoidant coping can be helpful to deal with short-term stressors, whereas using approach coping strategies has been linked with more positive adoption in the long run (Taylor & Stanton, 2007). A qualitative study by Andersson et al. (2011) focused on how women with a history of miscarriage coped with a new

pregnancy. The overall theme of the study was a fear of the pregnancy ending in termination due to past experience and their self-defense was to keep a distance from the pregnancy or to seek confirmation that the pregnancy was progressing normally. Their research indicates that some women tend to avoid dealing with their feelings regarding the pregnancy by distancing themselves from it (Cote-Arsenault & Donato, 2011; Lee et al., 2016). Furthermore, avoidant coping strategies have been linked with increased emotional distress (Nahlén Bose et al., 2016), and can lead to damaging behaviors (Taylor & Stanton, 2007).

Previous research has demonstrated that having low support and a short interpregnancy interval can contribute to worse mental health among pregnant women with a history of miscarriage (DeMontigny et al., 2017; Duman & Kocak, 2013) but less is known about how avoidant coping strategies affect mental health in this particular population. The aim of this study is to explore how support, coping strategies, and interpregnancy interval affect mental health in pregnant women with a history of miscarriage. This line of reasoning led to the following research questions: Does having a history of miscarriage affect pregnant women's mental health in Iceland. Also, does perceived social support, coping methods and interpregnancy interval contribute to anxiety, depression, and stress among Icelandic pregnant women with a history of miscarriage? These questions led to the testing of the following hypotheses: 1) Pregnant women who have a history of miscarriage experience more symptoms of anxiety, depression, and stress than women without such a history. 2) Women with a history of miscarriage experience more symptoms of anxiety, depression, and stress if they have low-moderate support compared to if they have high support. 3) Longer interpregnancy interval is connected with lower levels of depression, anxiety, and stress compared to if less time has passed. 4) Using more avoidant coping strategies is associated with higher levels of anxiety, depression, and stress than when using more approach coping strategies, among women with a history of miscarriage.

Distress during pregnancy can generate adverse pregnancy outcomes (Haselbeck et al., 2017) and there is a great need for more specified care for pregnant women with a history of miscarriage (DeBackere et al., 2008). Therefore, all efforts to gain knowledge about what contributes to worse mental health among pregnant women are valuable.

Method

Participants

This study is based on data collected in 2006-2011 for longitudinal research on Icelandic women's mental health during pregnancy and postpartum. A total of 2,523 Icelandic women participated in the study, with age ranging from 17 to 47 years ($M = 29.02$, $SD = 5.23$). To approach participants, a collaboration was established with 11 Primary Health Care Centers in Iceland, all located in the capital region except one. Eligibility requirements were being pregnant, being at least 16 years old, and speaking and reading Icelandic. Women diagnosed with schizophrenia, acute psychotic symptoms, or significantly impaired cognitive functioning were excluded from the research. Women who screened positive for depression/anxiety were invited a psychiatric interview, along with a randomly selected group of women that had screened negatively. Of those who accepted the interview, a sample of 650 women were included in this study due to them answering questions about having a history of miscarriage. Participants did not receive any compensation for participating in the study.

Measures

The Depression Anxiety and Stress Scales (DASS)

The Depression Anxiety and Stress Scales (DASS; Lovibond & Lovibond, 1995) is a self-report screening tool for depression, anxiety, and stress. The three subscales consist of 14 items each where participants are asked to rate how well each statement applied to them over the past week. The responses range from 0 = *did not apply to me at all*, to 3 = *applied to me*

very much, or most of the time. The possible range of the scores for each subscale is from 0-42, where higher scores indicate more severe symptoms. The scale includes questions like “I felt that I had nothing to look forward to” or “I felt I was close to panic”. The scale has good psychometric properties and all three subscales have acceptable validity and reliability, both the English version (depression: $\alpha = .91$, anxiety: $\alpha = .81$, stress: $\alpha = .89$; Lovibond & Lovibond, 1995) as well as the Icelandic version (depression: $\alpha = .97$, anxiety: $\alpha = .92$, stress: $\alpha = .95$; Björgvin Ingimarsson, 2010). The scale also had good reliability in this study (depression: $\alpha = .92$, anxiety: $\alpha = .85-.87$, stress: $\alpha = .93$). The cut-off score for depression was ≥ 10 while it was ≥ 8 for anxiety, which suggests a mild state of each condition (Lovibond & Lovibond, 1995).

The Multidimensional Scale of Perceived Social Support

The Multidimensional Scale of Perceived Social Support (MSPSS; Zimet et al., 1988) is a 12 item self-report scale that measures perceived social support. It can be divided into three subscales with 4 items each, considering the source of the support: Family, friends, and a significant other. Participants were asked to indicate the extent to which they agreed or disagreed about 12 statements on a Likert scale ranging from *very strongly disagree* (1) to *very strongly agree* (7), with higher scores representing more perceived social support. The following statement is an example from the scale: “There is a special person with whom I can share my joys and sorrows”. All subscales have acceptable psychometric properties (family: $\alpha = .87-.91$, friends: $\alpha = .85-.89$, and a significant other: $\alpha = .91$) and the scale as a whole has good psychometric properties ($\alpha = .88-.93$; Canty-Mitchell & Zimet, 2000; Zimet et al., 1988). In this study the psychometric properties were also adequate ($\alpha = .94$).

Brief Cope

The Brief Cope scale (Brief COPE; Carver, 1997) measures effective and ineffective coping mechanisms to deal with stressful life events. The scale consists of 28 items where

participants are asked to assess how much they have been using each coping statement on an ordinal scale from 1 (*I haven't been doing this at all*) to 4 (*I've been doing this a lot*). The scale is divided into 14 subscales, which can be used to construct two primary coping styles as avoidant or approaching (Eisenberg et al., 2011). An example of a statement that represents an approach coping style is: "I've been taking action to try to make the situation better" where the statement: "I've been blaming myself for things that happened" is an example that represents avoidant coping style. The scale has acceptable psychometric properties (Carver, 1997) for the two coping styles (approach coping: $\alpha = .71$ and avoidant coping: $\alpha = .70$; Eisenberg et al., 2011). In this study the psychometric properties of the Icelandic version of the scale were also acceptable ($\alpha = .69$) but the reliability for the two coping styles was questionable (approach coping: $\alpha = .61$ and avoidant coping: $\alpha = .45$).

Procedure

This study is based on a longitudinal research conducted in 2006-2011 to evaluate mental health among pregnant women in Iceland. Participants were approached at 12-14 weeks pregnant through 11 Primary Health Care Centers in Iceland and asked by a midwife or a nurse to participate. Three times during the pregnancy (16 weeks, 24-25 weeks, and 36 weeks) the women were screened for mental health issues by completing a series of questionnaires, and once (9 weeks) after delivery. The screening took place at the health care centers and was carried out by a midwife or a nurse. After each screening, the women who had scores above cut-off were invited to a diagnostic interview and a random sample of women below cut-off were also offered to participate in the same interview. The interviews were conducted by clinicians which were blind to the participants scores in the prior screening. The data used in the present study was gathered in the interviews at three measurement points, at 16, 24-25, and 36 weeks of pregnancy.

As for ethical considerations for the study, approval was received from the Icelandic Data Protection Authority (ref no. S2589) and the Icelandic National Bioethics Committee (ref no. 05-107-S1). All participants signed an informed consent after they approved to participate and were offered psychiatric treatment if needed. The women could withdraw their participation at any time during the study.

Data Analysis

The statistical software SPSS (IBM Corp, 2020) was used to analyze the data, but tables were created in Microsoft Word. Descriptive statistics were reported for socio-demographic information (age, education, marital status, financial situation, and legitimate children). A chi-square test was performed to check associations between socio-demographics and history of miscarriage. The independent variables in the study were; Having a history of miscarriage (or not), perceived social support, interpregnancy interval, and avoidant coping. The dependent variables were; Depression, anxiety, and stress.

An independent t-test was conducted to test the first hypothesis, stating that pregnant women with a history of miscarriage have a higher mean scores in anxiety, depression, and stress than those who do not. The t-test's assumptions of independence and normality were met and when the assumption of homogeneity of variances were not met corrected results were reported. An independent t-test was also used to test the second hypothesis regarding if women with a history of miscarriage experience more symptoms of depression, anxiety, and stress if they have low-moderate support. The perceived social support variable was split into two groups, low-moderate support, and high support, according to the scale response descriptors (Zimet, 2016). Scores from 1 to 5 were considered low to moderate support whereas scores from 5.1 to 7 were labeled as high support. All t-test assumptions were met.

To speculate about the third hypothesis, whether a short interpregnancy interval was associated with lower scores in DASS depression, anxiety, and stress, a one-way ANOVA

was conducted. The question asking about how much time had passed since the miscarriage (interpregnancy interval) was rounded from months to years. If the answer did not include months nor years, it was treated as missing. Attempts were made to create equally large groups, but the following division was considered most fitting; Women who miscarried within the last one year ($n = 64$), 2 years ago ($n = 37$), 3-5 years ago ($n = 34$), and lastly, women who miscarried more than 6 years ago ($n = 61$). All assumptions for the one-way ANOVA were met.

Finally, a linear regression was conducted to assess the fourth hypothesis, whether using more avoidant coping was more strongly associated with higher levels of anxiety, depression and, stress symptoms, compared to when using more approach coping strategies. All linear regression assumptions were fulfilled despite a little deviation in the data.

Results

Of the 650 women who attended a psychiatric diagnostic interview, 30.9% of the women had a history of miscarriage, with ages ranging from 17 to 43 ($M = 29.6$, $SD = 5.49$). Thereof, most had experienced one miscarriage or 33.8%, 19.4% had experienced two miscarriages, 9.5% had experienced three or more, but 37.3% were missing data. The interpregnancy interval ranged from 1 to 23 years ($M = 3.82$, $SD = 3.88$), but most women had miscarried within the last year from the new pregnancy (33.3%). As can be seen in Table 1, women with a history of miscarriage did differ in marital status, education, and if they had children, from those with no history of miscarriage.

Table 1

Socio-Demographic Information About Women with a History of Miscarriage and No History of Miscarriage

	History of miscarriage n (%)	No history of miscarriage n (%)	χ^2
Married or living with a partner	173 (87.4%)	413 (93.0%)	5.479*
Have children	130 (66.7%)	249 (57.1%)	5.130*
Has more than compulsory education	144 (73.1%)	372 (83.4%)	9.167*
Evaluate their financial situation good or ok	164 (83.2%)	396 (88.6%)	3.440

Note. Having stepchildren is not considered as having children.

* $p < .05$.

1. Hypothesis

The first hypothesis, which stated that pregnant women who have a history of miscarriage experience more symptoms of anxiety, depression, and stress than women without such history, was tested with independent samples t-tests. Means, standard deviation, and t-test results are reported in Table 2.

Table 2

Means, Standard Deviations and Independent Samples T-Test Statistics Between Women With and Without a History of Miscarriage

Variable	History of miscarriage		No history of miscarriage		<i>t</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Depression						
16 weeks	6.81	7.04	6.35	6.95	-.76	.22
25 weeks	6.34	6.54	5.20	6.03	-1.96	.03
36 weeks	6.16	8.30	4.64	5.53	-1.93	.03
Anxiety						
16 weeks	6.35	6.41	5.31	5.40	-1.98	.02
25 weeks	6.42	6.35	5.37	5.37	-1.85	.03
36 weeks	5.99	7.26	5.09	5.65	-1.30	0.10
Stress						
16 weeks	11.72	8.56	11.15	8.46	-.77	.22
25 weeks	12.54	8.04	10.66	7.76	-2.55	.01
36 weeks	11.05	8.88	9.81	8.02	-1.47	.07

Women with a history of miscarriage did have a slightly higher mean scores at all measurement points in depression, anxiety, and stress compared to women without such history. However, there was not a significant difference between women with or without a history of miscarriage in DASS depression scores at week 16 but a difference was found at week 25 and 36. A significant difference was found at week 16 in DASS anxiety scores, but not at week 25 or 36. There was no difference in mean DASS stress scores at week 16 or 36 but a difference was found at week 25.

2. Hypothesis

The second hypothesis stated that women with a history of miscarriage experienced more symptoms of anxiety, depression, and stress if they had low to moderate support compared to if they experienced high support. An independent sample t-test was performed to assess a difference in mean scores in DASS anxiety, depression, and stress at week 16, 25 and 36 for the groups; Low-moderate support and high support. Information about means, standard deviation, and t-test results can be found in Table 3.

Table 3

Means, Standard Deviations and Independent Samples T-Test Statistics Between Receiving Low-moderate Support and High Support

	Low-moderate support		High support		<i>t</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Depression						
16 weeks	15.61	9.47	5.62	6.95	4.91	<.001
25 weeks	14.15	10.45	5.21	5.02	3.74	.001
36 weeks	16.50	11.24	4.87	7.67	3.73	.002
Anxiety						
16 weeks	11.96	8.33	5.43	5.62	3.62	.001
25 weeks	11.90	9.38	5.68	5.62	2.87	.009
36 weeks	13.29	10.00	4.73	6.68	3.10	.007
Stress						
16 weeks	18.32	9.70	11.19	8.23	3.65	<.001
25 weeks	19.05	10.12	11.87	7.47	3.65	<.001
36 weeks	20.43	9.91	9.21	8.01	4.72	<.001

There was a significant difference between the two groups at all measurement points in depression, anxiety, and stress. The women who experienced low-moderate support had higher mean scores in depression, anxiety and stress than women who experienced high support. Interestingly, mean scores in DASS depression, anxiety and stress have an increasing trend for the low-moderate support groups with a progression of the pregnancy while the scores slightly decline for the high support group.

3. Hypothesis

To test the third hypothesis, that a longer interpregnancy interval is connected with lower levels in DASS depression, anxiety, and stress compared to if less time has passed, a one-way ANOVA was conducted. There was no statistically significant differences between the interpregnancy interval groups in DASS anxiety nor depression at week 16, 25, or 36 ($p > .05$). There was a difference between groups in DASS stress at week 25, $F(3, 158) = 2.811, p = .041$, but a Bonferroni post-hoc test only demonstrated a significant difference between having a miscarriage in the last year and in the last 3-5 years ($p = .024$). No statistical difference was found in DASS stress at week 16 or 36 ($p > .05$). As seen in Table 4, the mean scores in DASS anxiety, depression, and stress were relatively similar at all measurement points and there was not a clear decrease pattern in mean scores with a progression of the pregnancy.

Table 4

Means and Standard Deviations for DASS Depression, Anxiety and Stress Scores at Different Interpregnancy Intervals

Variable	16 weeks		25 weeks		36 weeks	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Depression						
1 year	6.62	7.61	5.79	6.70	4.43	6.87
2 years	6.46	7.21	6.94	6.83	7.74	8.45
3 - 5 years	8.39	7.06	8.34	7.06	7.50	8.92
6 or more years	6.37	6.31	5.33	5.68	6.28	9.11
Anxiety						
1 year	6.63	6.73	5.67	5.67	4.93	5.92
2 years	6.43	6.30	7.37	7.37	8.75	8.99
3 - 5 years	6.91	7.16	7.49	7.49	5.86	6.46
6 or more years	5.70	5.76	5.66	5.66	5.59	7.82
Stress						
1 year	11.59	8.63	10.83	7.29	9.33	8.35
2 years	10.03	7.25	12.03	7.19	13.17	10.13
3 - 5 years	13.47	10.27	16.14	8.81	12.82	9.59
6 or more years	11.92	8.22	12.65	8.43	10.41	7.94

4. Hypothesis

The fourth hypothesis, that using more avoidant coping strategies is associated with higher levels of anxiety, depression, and stress than when using more approach coping strategies, was tested with multiple linear regression analyses. The analysis was carried out to examine how the coping strategies affected depression, anxiety, and stress at all measurement points but the models were insignificant for week 25 and 36 of pregnancy. Nonetheless, the results from the regression models at week 16 were significant and can be found in Table 5.

Table 5*Multiple Regression Results for Depression, Anxiety and Stress at 16 Weeks of Pregnancy*

Variable	B	95% CI for B		SE B	β	R ²
		LL	UL			
Depression						
Constant	3.80	-5.87	13.46	4.90		.211
Avoidant coping	0.44*	0.11	0.78	0.17	.22*	
Approach coping	-0.32*	-0.61	-0.04	0.14	-.19*	
Anxiety						
Constant	-8.28	-16.90	0.34	4.37		.289
Avoidant coping	0.58**	0.27	0.88	0.15	.30**	
Approach coping	-0.06	-0.32	0.20	0.13	-.04	
Stress						
Constant	-8.13	-19.66	3.40	5.84		.295
Avoidant coping	0.79**	0.38	1.20	0.21	.31**	
Approach coping	-0.09	-0.44	0.25	0.18	-.04	

* $p < .05$. ** $p < .001$.

Avoidant and approach coping strategies explained 21.1% of the variance in depression at week 16 ($F(2, 174) = 4.07, p = .019$). Holding approach coping strategies constant, for a one-point increase in avoidant coping strategies, the DASS depression score increased on average by 0.44 points. The model predicting DASS anxiety scores was also significant at week 16 ($F(2, 177) = 8.06, p < .001$), and the model accounted for 28.9% of the variance in anxiety. Avoidant coping had increasing effect on the anxiety ($\beta = .30$) but approach coping did not have a significant effect on anxiety. Similar results were found for the third model ($F(2, 172) = 8.20, p < .001$), which explained 29.5% of the variance in stress. Avoidant coping strategies significantly predicted increased stress at week 16 ($\beta = .31$), although approach coping strategies did not have a significant effect.

Discussion

The main aim of the study was to examine the mental health of pregnant women with a history of miscarriage in Iceland and to explore how perceived social support, coping methods, and interpregnancy interval affected the mental health of these women. It was

hypothesized that pregnant women who had a history of miscarriage experienced more symptoms of anxiety, depression, and stress than women without such a history. The results showed that pregnant women with a history of miscarriage did have slightly higher mean scores in depression, anxiety, and stress at all measurement points but a significant difference between groups was only found at week 25 and 36 for depression, week 16 for anxiety, and at week 25 for stress. Previous studies have suggested that women with a history of miscarriage are more vulnerable to mental health issues in later pregnancies than women without such history but these issues diminish with a normal progression of the pregnancy (Chojenta et al., 2014; Gong et al., 2013). This study can only provide partial support to these studies because of the small difference between the groups although the mean scores did have a diminishing trend with the progression of the pregnancy for both groups.

The second hypothesis tested if women with a history of miscarriage experienced more symptoms of anxiety, depression, and stress if they had low-moderate support compared to if they had high support. The result showed the importance of support because a clear difference was found in mean depression, anxiety, and stress scores between women who experienced low-moderate support and high support. The women with high support had significantly fewer symptoms of depression, anxiety, and stress at all measurement points which is consistent with previous studies (Duman & Kocak, 2013; Scheidt et al., 2012). Also, there was a slight decrease in depression, anxiety, and stress for women with high support by week 36 while there was an increasing trend for those who experienced low-moderate support. Though the escalation was small it could indicate worsen mental health with the progression of pregnancy among women who do not get sufficient support, which is concerning and should be looked at further in future studies.

The third hypothesis was that a longer interpregnancy interval was connected with lower levels in DASS depression, anxiety, and stress compared to if less time has passed,

among women with a history of miscarriage. Prior studies showed that a short interpregnancy interval was connected with higher levels of anxiety or depression than if more time had passed since the miscarriage occurred (DeMontigny et al., 2017; Gong et al., 2013). The study results showed that there was no difference in having miscarried within the year or more than 6 years ago regarding anxiety and depression at any measurement point. The only significant difference between interpregnancy interval groups found was at week 25 in stress where those who miscarried in the past year had the lowest stress scores and those who miscarried 3-5 years ago had the highest which is contrary to findings from past studies. This difference did not support the hypothesis that women with the longest interpregnancy interval had lower stress scores than women with short interpregnancy interval.

The fourth and last hypothesis tested if using more avoidant coping strategies was associated with higher levels of anxiety, depression, and stress compared to when using more approach coping strategies. Avoidant coping strategies were statistically significant when predicting increasing depression, anxiety and stress scores at week 16 where approach coping strategies only significantly predicted decreasing depression at week 16. As hypothesized, avoidant coping strategies were linked with higher levels of depression, anxiety and stress but approach coping strategies were only linked with lower levels of depression. Although the influence of the coping strategies was in accordance with previous research the effects of both coping strategies were more ambiguous than prior research had proclaimed (Nahlén Bose et al., 2016; Taylor & Stanton, 2007).

The strengths of the study were the large numbers of participants and their good distribution in socio-demographics which provides a realistic sample of the general public in Iceland. The study has some limitations which could influence the results in one way or another. Women were not asked when during their prior pregnancy their miscarriage occurred which could have prevented misinterpretation. Miscarriage is dependent on the

participant's subjective meaning of the term because some could consider a miscarriage after 12 weeks to be a death of a child. Also, most women miscarry within the first 12 weeks and that period is often most challenging for them in subsequent pregnancies but this period was not included in this study. Furthermore, there was substantial data missing from the interpregnancy interval variable which could have affected the outcome as well as the unequal sizes of the groups. The reliability of the Icelandic version of the Brief Cope subscales were questionable which needs to be considered when interpreting the results.

In conclusion, the study results demonstrate that pregnant women with a history of miscarriage experience more symptoms of depression at week 25 and 36, more anxiety at the beginning of the pregnancy, and more stress at week 25 of pregnancy compared to pregnant women without such history. The difference between these mean scores is relatively small and raises questions about whether it is clinically significant. Furthermore, the study underlines the importance of support for pregnant women with history of miscarriage because the women with high perceived support did experienced lower levels of depression, anxiety, and stress symptoms than those with low-moderate support. The longer interpregnancy interval was not connected with lower scores on the DASS scale indicating that the adversities linked with having a history of miscarriage do not necessarily resolve with more time passed. Also, women using more avoidant coping strategies were more vulnerable to experiencing higher levels of depression, anxiety, and stress symptoms. The effects of using more approach coping strategies indicated lower scores in depression but they were close to zero and insignificant for anxiety and stress.

Future studies should focus on gathering clarity about the inconsistencies in this study, for example, previous studies have found a link between short interpregnancy interval and higher anxiety. However, this study did not provide any evidence for lower levels in depression, anxiety, or stress among women based on interpregnancy interval. It would also

be interesting to see if depression, anxiety and stress levels are higher during the first 12 weeks compared to later in pregnancy because that period has the highest risk for miscarriage. Future studies could also examine the coping strategies to a greater extent and try to unravel why approach coping did not influence the women's mental health more positively.

These findings provide insightful information about pregnant women with a history of miscarriage and not only can it help health professionals to understand this group better, but also, this knowledge could be used to design interventions to minimize the negative effects of having a history of miscarriage. The results could influence health professionals to provide more support during maternal care since receiving high support can be linked with lower levels in depression, anxiety and stress. It is crucial to continue unraveling factors that contribute to better mental health among women with a history of miscarriage to assemble the best treatment possible for these women.

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