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Full title: Psychological distress in pregnant and postpartum individuals during Covid-19 and factors associated with resiliency

Short title (max 50 characters): Distress and resiliency while pregnant during Covid

Author Information
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Psychological distress and behavioral changes in pregnant and postpartum individuals during the Covid-19 pandemic

ABSTRACT

Objectives: To determine the psychological and behavioural effects of the COVID-19 pandemic on a Canadian cohort of individuals during pregnancy and the postpartum period.

Methods: In 2020, individuals between 20 weeks gestation and 3 months postpartum receiving maternity care from an urban Canadian clinic were invited to complete a questionnaire. The purpose-built questionnaire used validated scales including the Medical Outcomes Study Social Support Survey (MOS), Depression, Anxiety and Stress Scale (DASS-21), Edinburgh Postnatal Depression Scale (EPDS), and questions from a SARS study.

Results: One hundred nine people completed the questionnaire (response rate, 55%) of whom 57% (n = 62) were postpartum. Most respondents (107, 98%) were married and had completed post-secondary education (104, 95%). Despite these protective factors, moderate to severe levels of depression (22%), anxiety (19%) and stress (27%), were recorded using the DASS-21, and 25% of participants (26) had depression (score ≥11) using the EPDS. Despite high social support in all MOS domains (median scores 84–100), a majority of participants reported loneliness (69, 67%) and were nearly or totally housebound (65, 64%). About half of participants worried about themselves (50, 46.3%) or their baby (59, 54%) contracting COVID-19, while the majority postponed (80, 74.1%) and cancelled (79, 73.2%) prenatal appointments. Being homebound or feeling lonely / lacking support were significant risk factors for psychological distress ($P = 0.02$) whereas exercise and strong social support were protective ($P < 0.05$).

Conclusion: Pregnant and postpartum individuals experienced moderate to severe depression, anxiety, and stress during the COVID-19 pandemic. Exercise and strong social support were
RÉSUMÉ

Objectifs : Déterminer les effets psychologiques et comportementaux de la pandémie de COVID-19 sur une cohorte de Canadiennes pendant la grossesse et le post-partum.

Méthodologie : En 2020, des personnes recevant des soins de maternité dans une clinique urbaine canadienne, entre 20 semaines d’aménorrhée et 3 mois post-partum, ont été invitées à remplir un questionnaire. Le questionnaire expressément conçu pour l’étude repose sur des échelles validées, dont l’échelle de soutien social de l’Étude des issues médicales (MOS); l’échelle de dépression, d’anxiété et de stress en 21 questions (EDAS-21); l’échelle de dépression post-partum d’Édimbourg (EPDS); et des questions tirées d’une étude sur le SRAS.

Résultats : En tout, 109 personnes ont rempli le questionnaire (taux de réponse : 55 %) et 57 % (n = 62) d’entre elles étaient en post-partum. La plupart des répondantes (107; 98 %) étaient mariées et avaient fait des études postsecondaires (104; 95 %). Malgré ces facteurs de protection, l’échelle EDAS-21 a relevé des degrés modéré à sévère de dépression (22 %), d’anxiété (19 %) et de stress (27 %); et l’échelle EPDS a indiqué que 25 % des participantes (26) souffraient de dépression (score ≥ 11). Malgré un soutien social élevé dans tous les domaines de l’échelle MOS (scores médians : 84-100), une majorité de participantes ont fait état d’un sentiment de solitude (69; 67 %) et se sont dites souvent ou toujours confinées à la maison (65; 64 %). Environ la moitié des participantes s’inquiétaient de contracter la COVID-19 (50; 46,3 %) ou que leur bébé puisse la contracter (59; 54 %); la majorité des participantes ont ainsi reporté (80; 74,1 %) ou annulé (79; 73,2 %) leurs rendez-vous de suivi prénatal. Le confinement à la maison ou le
sentiment de solitude et le manque de soutien étaient des facteurs de risque importants de détresse psychologique ($p = 0,02$), tandis que l’exercice et un solide soutien social étaient des facteurs de protection ($p < 0,05$).

**Conclusion** : Les femmes enceintes et en post-partum ont souffert de dépression, d’anxiété et de stress d’intensité modérée à sévère pendant la pandémie de COVID-19. L’exercice et le soutien social étaient des facteurs de protection. Les fournisseurs de soins de santé peuvent identifier les personnes ayant besoin d’un plus grand soutien en s’informant sur la situation à la maison et les activités.

**Keywords**: Pregnancy, Social Support, Covid-19, Depression, Anxiety
Introduction

Since the recognition of Coronavirus disease (Covid-19) in late 2019, the SARS-CoV-2 virus has spread globally. While social and physical distancing measures have assisted in slowing its spread, disruptions to daily life and social isolation have potential to create secondary problems. As well, fear of the illness for self and family poses a significant burden on pregnant individuals’ mental health.

Previous research on the impact of natural disasters, including infectious disease outbreaks, on mental health has demonstrated increases in prevalence of depression, anxiety, insomnia and stress. Furthermore, the associated adverse psychosocial consequences associated with quarantine and isolation have disproportionately affected those at higher risk of mental health disorders. The perinatal period is a significant risk factor given the World Health Organization estimate that worldwide about 10% of pregnant individuals and 13% of individuals who have just given birth experience a mental health disorder, primarily depression.

During the 2003 SARS epidemic pregnant individuals experienced anticipatory worry and heightened depression, anxiety and stress. Some suffered insomnia and feared antenatal visits while others cancelled or postponed tests. Covid-19 pandemic research has demonstrated the increased risk of depression and anxiety amongst pregnant individuals during this much more protracted pandemic. A Canadian survey of pregnant and postpartum individuals, early on in the
pandemic, found that rates of depression and anxiety increased significantly to 40.7% and 72% respectively, compared to pre-pandemic pregnancy depression and anxiety prevalence of 12% and 15% respectively. Another 2021 Canadian study found 57.1% of pregnant respondents reported clinically significant levels of depression and 43% reported significant worry regarding their infant’s health. Of concern is how these maternal mood symptoms may impact maternal and child health long-term. Studies have shown perinatal psychological distress can be associated with increased risk of preterm delivery, low birth weight and pregnancy complications and may affect mother-infant bonding and childhood cognitive and emotional development.

Recognizing psychological distress during pregnancy poses a risk to mother and child, it is important to not only determine the risk of distress within this population during Covid-19, but also how social and physical distancing measures have impacted this risk. This study aimed to determine the prevalence of depression, anxiety and stress within a sample of prenatal and postpartum individuals and to explore factors associated with this distress including Covid-19 related distress and behaviors, coping mechanisms such as exercise and perception of social support.

**Methods**

**Participants**

A cross-sectional survey was conducted from June to August 2020, during the Covid-19 pandemic in Toronto, Canada. Lockdown measures had been in place from March 13, 2020. All individuals between 20 weeks’ gestation and 3 months postpartum receiving maternity care from
an urban interprofessional family medicine clinic providing comprehensive maternity care were invited to participate. Participants who could comprehend and speak English were invited via email to complete an online survey exploring psychological and behavioral changes to the Covid-19 pandemic.

*Questionnaire development*

Participants completed a questionnaire developed for this study by the research team. We included validated tools to assess mood and stress. The questionnaire assessed mental health, Covid-19 related distress, behavioral changes, the pandemic’s impact on daily life and coping strategies. Questions were informed by the authors’ experiences working with pregnant individuals and included questions from a previous study assessing the psychological and behavioral impact of the SARS pandemic during pregnancy. The latter questions had been validated by an ethnographic inquiry. The questionnaire was piloted with three pregnant and one non-pregnant individual for content clarity and face validity. Maternal depression was examined using the Edinburgh Postnatal Depression Scale (EPDS)\(^{10}\) and the Depression Anxiety and Stress Scale (DASS-21).\(^{11}\) The latter was also used to examine maternal symptoms of anxiety and stress. The EPDS is a self-report questionnaire consisting of 10 items scored on a 4 point Likert scale, with possible scores ranging from 0 to 30 and is validated in the pregnant and postpartum population, demonstrating good internal consistency and reliability (Cronbach’s alpha=0.77), as well as strong sensitivity (64-100% and specificity (73-100%).\(^{12}\) The DASS-21 is a self-report questionnaire consisting of 21 items making up 3 subscales (Depression, Anxiety and Stress). Each item is scored on a 4-point Likert scale from 0 (Never) to 3 (Almost always). Total scores for each subscale were multiplied by 2 (by convention), with the total scores for each subscale
ranging from 0-42. The DASS-21 has been found to reliably differentiate between depression, anxiety and stress, while demonstrating strong internal consistency and reliability (Cronbach alpha=0.93) and validity (r=0.67 or greater).\textsuperscript{13}

The 19 item self-reported Medical Outcomes Study (MOS) Social Support Survey\textsuperscript{14} assesses elements of social support including emotional support (expression of positive affect, empathetic understanding, and encouragement of expressions of feelings), tangible support (provision of material aid or behavioral assistance), affectionate support (involving expressions of love and affection) and positive social interactions (availability of other persons to do fun activities with).\textsuperscript{14} Items are scored on a 5-point Likert scale, from 1 (None of the time) to 5 (All of the time), with total scores for each domain ranging from 0-100. Higher MOS scores indicate greater social support. The MOS was validated in a North American population demonstrating good internal validity (r=0.72) as well as high internal consistency and reliability (Cronbach’s alpha=0.97).\textsuperscript{14} Given our sample reported high social support, we treated this variable categorically, with a median cut-off score used to differentiate between high and low social support.

\textit{Statistical Analyses}

Analyses were conducted using SAS software version 9.4.\textsuperscript{15} Descriptive statistics were computed using means and standard deviations, or frequencies and percentages where applicable. Prevalence rates for depression, anxiety and stress were calculated using frequency distributions. Clinically relevant levels of psychological symptoms for the three specified outcomes were determined using scoring guides as well as cutoff scores identified in previous literature.
assessing psychological distress in pregnant and post-partum women.\textsuperscript{16, 17} Scores of 11 or greater on the EPDS were considered indicative of clinical depression.\textsuperscript{18} Depression, anxiety and stress were identified using the following cut-off scores: DASS-Depression \( \geq 10 \), DASS-Anxiety \( \geq 8 \) and DASS-Stress \( \geq 15 \).\textsuperscript{16} Univariate log-binomial logistic regression models were used to assess the relationship between socio-demographic factors, Covid-19 related behavioral changes, stressors and perceived social support with depression, anxiety and stress as identified through the EPDS and DASS-21, respectively.

**Results**

The questionnaire was completed by 109/200, response rate of 55\%. Demographics are reported in Table 1. 43\% were pregnant and 57\% were postpartum. 19-27\% of participants experienced clinically significant psychological distress as identified through the EPDS and DASS-21 subscales as reported in Table 2.

Table 3 displays behavioral changes and participants response to Covid-19. Nearly all respondents (96\%) reported more frequent handwashing, with nearly two thirds (63\%) reporting wearing a mask most or all of the time. While the majority believed it to be unlikely that they or their baby would contract Covid-19 (82\% and 72\%, respectively), they worried about people contracting Covid-19 (46\% themselves, 54\% their baby, 59\% their partner, 62\% friends/relatives). Approximately one-third of participants (36\%) reported fear regarding attending appointments, with nearly three quarters (74\%) reporting postponing prenatal appointments and 73\% reporting cancelling some appointments (73\%).
Table 4 shows factors that were significantly associated with depression, anxiety and stress. Individuals who were postpartum during the study, were at increased risk of depression compared to those who were pregnant (RR 3.26, p<0.01). Those who reported fear of attending prenatal appointments had a 3-fold increased risk of depression (RR 3.14, p<0.01), and 4-fold increased risk of stress (RR 4.07, p<0.01), compared to individuals who reported no fear.

Coping strategies used by participants during the pandemic were assessed including seeking information, talking to health care providers (HCPs), mindfulness and keeping busy, none of which were significantly associated with level of psychological distress. In contrast, exercise and other self-reported feelings of support, as identified by the MOS scale, were found to be associated with decreased risk of distress. Individuals who exercised at minimum on a weekly basis, had a 61% decreased risk of depression (RR 0.39, p<0.01), 64% decreased risk of anxiety (RR 0.36, p=0.02) and 57% decreased risk of stress (RR 0.43, p<0.01) compared to respondents who rarely exercised. Those who reported support through positive social interactions were at a 60% decreased risk of depression, as measured by the DASS-21 (RR 0.40, p=0.04). Additionally, receiving affectionate support was a possible protective factor against stress (RR 0.52, p=0.04).

The personal experiences and reactions to isolation were also assessed. Feeling an “inability to freely leave their home” i.e. being homebound was associated with an approximate 3 fold increased risk of depression (RR 3.13, p=0.02: EPDS) (RR 3.72, p=0.02: DASS-21), as well as a 4 fold increased risk of stress (RR 4.43, p=0.01). Participants who expressed a feeling of uneasiness in the home also had a significant increased risk of depression (RR 5.05, p<0.01: DASS-21).
EPDS, RR 5.03, p<0.01: DASS-D, anxiety (RR 4.15, p<0.01) and stress (RR 6.42, p<0.01). A feeling of lack of security and lack of support were associated with an approximately 3-fold increased risk of depression (RR 2.64, p<0.01; RR 3.51, p=0.03: EPDS). Both feelings of uneasiness within the home and lack of security due to Covid-19 were associated with a four-fold increased risk of anxiety (RR 4.15, p<0.01 and RR 4.80, p<0.01) respectively.

Discussion

Depression and anxiety were found to be significantly higher in our pandemic cohort compared to pregnant and postpartum pre-pandemic cohorts. More specifically, postpartum participants (as compared to pregnant) were more likely to report depression on the EPDS. Previous studies have found depressive symptoms, unstable mood and anxiety are significant risk factors for developing peripartum depression. This indicates that pregnant and postpartum individuals who were already susceptible to mental health disorders at baseline may face increased adversity during the pandemic due to several factors including isolation imposed by social distancing measures.

Over one third of participants expressed fear of attending appointments due to Covid-19, with almost three quarters deciding to postpone or cancel appointments, a similar finding to that reported during the SARS pandemic. Avoiding prenatal visits and antenatal ultrasounds during Covid-19 to reduce risk of exposure may lead to increased rates of unrecognized pregnancy complications.
Feelings of uneasiness being at home, lack of security and a feeling of being homebound were more likely to be associated with depression and anxiety. Lockdown and social distancing measures impair the delivery of important support during pregnancy and postpartum. Loss of these supports can, in turn, lead to a deterioration in mental health. Furthermore, increased family stress, loss of income and social isolation may increase the risk of domestic violence. One of the unfortunate results of pandemic lockdown is a global increase in domestic violence. Although this study did not incorporate specific questions about this, it is important for HCPs to consistently assess and recognize the signs of intimate partner and family violence.

Individuals who reported adequate emotional, tangible and affectionate support measured by the MOS had a reduced risk of depression and anxiety. The impact of social support as a protective factor during the pandemic has been reported. The importance of social support and its “buffering effect” was also seen in the SARS data as those that reported more social support were less depressed. Finally, individuals who exercised at least weekly or more were significantly less likely to have depression, anxiety or stress, similar to a previous study.

This prospective study had several strengths as it was able to identify potential risks and protective factors for psychological distress that can be targeted by HCPs as part of prenatal care. Our study had an adequate response rate. The questionnaire used validated scales as well as questions from previous studies and questions informed by our team experience working with pregnant individuals. The questions were piloted and modified based on feedback.
Limitations include data being derived from a single urban center of generally well-educated, English speaking and largely financially-stable participants. Comfort with completing self-reports and English fluency may have affected participation and results. Furthermore, individuals from more rural settings, vulnerable populations such as those in low-SES or racialized populations were not represented. The generalizability of our findings is therefore guarded as higher rates of psychological distress may be observed in less well-resourced centers. We also did not collect data on participants’ comorbidities and did not account for these in our analyses. It is possible that some may have had higher baseline levels of psychological distress symptoms or pre-existing physical concerns limiting their ability or motivation to participate in exercise. Due to sample size constraints we were unable to conduct subgroup analyses comparing pregnant and post-partum patients to further understand potential differences. Further research is needed to explore potential differences between pregnant and postpartum individuals’ responses to stresses such as a pandemic.

**How these findings can be integrated into clinical practice**

Routinely asking patients about their psychosocial health, using tools such as the EPDS or the Antenatal Psychosocial Health Assessment (ALPHA)\textsuperscript{24} form, may facilitate identifying and addressing concerns. The screening process should also include inquiry about pandemic stressors, isolation, intimate partner violence, financial hardships and occupational work hazards. The increased risk for depression in postpartum individuals found in this study suggests that additional efforts and resources are needed to counteract a pandemic’s potentially long lasting impact on mood, parenting and family bonding.
It is important to address this issue by seeking out creative ways to help this vulnerable population who may be experiencing reduced access to sources of support. Providers might suggest participation in online communities on social media and mobile health applications as suggested in previous literature.\(^{25}\)

Missed appointments should prompt further inquiry into mental health. It is important to proactively address fears with patients and reinforce the importance of regular antenatal visits and investigations such as ultrasound imaging which may foster infant bonding. High-risk symptoms and early diagnoses requiring management may be missed due to delays or cancelation of appointments. A modified prenatal schedule that includes a combination of in person and virtual appointments could relieve some patient anxiety and has been found to be effective.\(^{26}\)

Finally, encouraging pregnant individuals to exercise may potentially decrease psychological stress. Current guidelines recommend 150 minutes of physical activity per week during pregnancy with potential for modifications as the pregnancy progresses.\(^{27}\) When not in lockdown, patients should be encouraged to leave the home, to exercise and safely engage with people they feel supported by. If social distancing measures are imposed, then patients could use technology and connect with people via video chat platforms.

**Conclusion**

This study identified a significant prevalence of depression, anxiety and stress in pregnant and postpartum individuals during the Covid-19 pandemic. Individuals who participated in at
minimum weekly exercise and who described strong social support reported significantly
decreased psychological distress. HCPs should ensure they are asking about mood symptoms and
addressing mental health concerns during the perinatal and postpartum period as well as
monitoring for missed antenatal visits, laboratory and imaging tests. HCPs play a pivotal role in
ensuring pregnant individuals receive supportive care throughout the pregnancy and postpartum
period given that during a pandemic the usual support from family and friends may be
inaccessible. The healthcare system should anticipate the extra burden of psychological distress
that pregnant and postpartum individuals will experience during a pandemic and be prepared to
bolster existing resources to meet that need.
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Table 1: Sociodemographic characteristics of participants (N = 109)

| Characteristics                        | No. (%) of participants |
|----------------------------------------|-------------------------|
| Maternal age, y, mean ± SD             | 34 ± 3.7                |
| Marital status                         |                         |
| Married/common-law                     | 107 (98.2)              |
| Pregnancy status                       |                         |
| Pregnant                               | 47 (43.1)               |
| Postpartum                             | 62 (56.9)               |
| History of pregnancy                   |                         |
| Primiparous                            | 74 (67.9)               |
| Household income, CAD$                 |                         |
| >100 000                               | 67 (61.5)               |
| 50 000–100 000                         | 24 (22.0)               |
| <50 000                                | 3 (2.8)                 |
| Prefer not to say                      | 15 (13.8)               |
| Level of education                     |                         |
| Completion of graduate or professional training | 55 (50.5) |
Completion of college or university: 49 (45.0)
Some college/university/specialized training: 4 (3.7)
High school graduate: 1 (0.9)

Unless otherwise specified.

Table 2: Proportion of sample experiencing clinically significant psychological distress (N = 103)

| Psychological distress scores | No. (%) |
|-------------------------------|--------|
| EPDS ≥11                      | 26 (25.2) |
| DASS – Depression subscale ≥10<sup>a</sup> | 22 (21.8) |
| DASS – Anxiety subscale ≥8<sup>b</sup> | 19 (18.6) |
| DASS – Stress subscale ≥15<sup>b</sup> | 27 (26.5) |

<sup>a</sup>n = 101
<sup>b</sup>n = 102

DASS-S: Depression, Anxiety and Stress Scale; EPDS: Edinburgh Postnatal Depression Scale.

Table 3: Behavioural and psychological changes in response to the COVID-19 pandemic

| Responses to COVID-19                          | No. (%) respondents |
|-----------------------------------------------|---------------------|
| Hand hygiene                                  | Less | No change | More | Much more |
| Increased hand-washing                        | 0 (0.0) | 4 (4.0) | 36 (36.4) | 59 (59.6) |
| Infection prevention measures                 | Never/rarely | Sometimes | Mostly | All of the time |
| Use of masks                                  | 2 (1.9) | 38 (35.5) | 34 (31.8) | 33 (30.8) |
| Use of gloves                                 | 81 (77.1) | 17 (16.2) | 5 (4.8) | 2 (1.9) |
| Perception of likelihood of contracting COVID-19 | Very unlikely | Unlikely | Likely | Very likely |
| For Baby                                      | 19 (17.6) | 70 (64.8) | 17 (15.7) | 2 (1.9) |
| For Self                                      | 15 (13.8) | 74 (67.9) | 18 (16.5) | 2 (1.8) |
| Fear of contracting COVID-19                  | Not worried | Slightly worried | Worried | Very worried |
| For Baby                                      | 9 (8.3) | 41 (37.6) | 33 (30.3) | 26 (23.9) |
| For Self                                      | 7 (6.4) | 51 (46.8) | 42 (38.5) | 8 (7.3) |
| For Partner                                   | 6 (5.5) | 39 (35.8) | 45 (41.3) | 19 (17.4) |
| For friends/relatives                         | 1 (0.9) | 40 (36.7) | 40 (36.7) | 28 (25.7) |
| Worry regarding adverse Outcomes             | Not worried | Slightly worried | Worried | Very worried |
| Birth defects caused by medication            | 35 (32.4) | 31 (28.7) | 23 (21.3) | 19 (17.6) |
| Miscarriage                                   | 36 (33.6) | 25 (23.4) | 26 (24.3) | 20 (18.7) |
| Preterm delivery                              | 22 (21.0) | 38 (36.2) | 24 (22.9) | 21 (20.0) |
| Newborn contracting COVID-19 post-delivery    | 9 (8.5) | 38 (35.9) | 33 (31.1) | 26 (24.5) |
| Changes to prenatal care                     | No | Neutral/ considered<sup>a</sup> | Yes | — |
| Fear of attending appointments                | 55 (50.9) | 14 (13.0) | 39 (36.1) | — |
| Postponing appointments                       | 18 (16.7) | 10 (9.3) | 80 (74.1) | — |
| Cancelling appointments                       | 18 (16.7) | 11 (10.2) | 79 (73.2) | — |

<sup>a</sup>Fear of attending appointment rated No, Neutral, or Yes while Postponing and cancelling appointments rated No, Considered or Yes.
Table 4: Significant factors associated with depression, anxiety and stress as measured by the EPDS and DASS-21 (N = 103)

| Factor                                      | No (% of respondents) | Depression\(^a\) (RR\(^c\) (95% CI) | P value | Anxiety\(^b\) (RR\(^c\) (95% CI) | P value | Stress\(^b\) (RR\(^c\) (95% CI) | P value |
|---------------------------------------------|------------------------|---------------------------------------|---------|-----------------------------------|---------|-----------------------------------|---------|
| **Patient-related factor**                  |                        |                                       |         |                                   |         |                                   |         |
| Pregnancy status                            |                        |                                       |         |                                   |         |                                   |         |
| Pregnant                                    | 45 (43.7)              | —                                    | —       | —                                 | —       | —                                 | —       |
| Postpartum                                  | 58 (56.3)              | 3.26 (1.33-7.97)\(^a\)              | <0.01   | —                                 | —       | —                                 | —       |
| **COVID-19 related distress**               |                        |                                       |         |                                   |         |                                   |         |
| Fear of attending appointments              |                        |                                       |         |                                   |         |                                   |         |
| No/Neutral\(^d\)                           | 50 (48.5)              | —                                    | —       | —                                 | —       | —                                 | —       |
| Yes                                        | 53 (51.5)              | 3.14 (1.38-7.19)\(^a\)              | <0.01   | —                                 | —       | 4.07 (1.67-9.91) \(^a\) <0.01   |         |
| Worry of contracting COVID-19\(^e\)        |                        |                                       |         |                                   |         |                                   |         |
| No/Neutral\(^d\)                           | 48 (47.1)              | —                                    | —       | —                                 | —       | —                                 | —       |
| Yes                                        | 54 (52.9)              | 3.81 (1.56-9.33)\(^a\); 3.08 (1.23-7.71)\(^b\) | <0.01; 0.02 |                                   |         | 2.54 (1.18-5.47) \(^b\) 0.02   |         |
| **Coping mechanisms**                       |                        |                                       |         |                                   |         |                                   |         |
| Exercise\(^e\)                              |                        |                                       |         |                                   |         |                                   |         |
| Monthly or less\(^d\)                      | 27 (26.5)              | —                                    | —       | —                                 | —       | —                                 | —       |
| At least weekly                             | 75 (73.5)              | 0.39 (0.20-0.75)\(^a\)              | <0.01   | 0.36 (0.16-0.82)                  | 0.02    | 0.43 (0.23-0.80)                  | <0.01   |
| **MOS social support subscales**            |                        |                                       |         |                                   |         |                                   |         |
| Emotional support                           |                        |                                       |         |                                   |         |                                   |         |
| <84.4\(^d\)                                | 49 (47.6)              | —                                    | —       | —                                 | —       | —                                 | —       |
| >84.4                                      | 54 (52.4)              | 0.40 (0.19-0.84)\(^a\); 0.34 (0.14-0.80)\(^b\) | 0.02; 0.01 | —                                 | —       | —                                 | —       |
| Tangible support                            |                        |                                       |         |                                   |         |                                   |         |
| <87.5\(^d\)                                | 42 (40.8)              | —                                    | —       | —                                 | —       | —                                 | —       |
| >87.5                                      | 61 (59.2)              | 0.50 (0.26-0.99)\(^a\)              | 0.04    | —                                 | —       | —                                 | —       |
| Affectionate support                        |                        |                                       |         |                                   |         |                                   |         |
| <100\(^d\)                                 | 34 (33.0)              | —                                    | —       | —                                 | —       | —                                 | —       |
| >100                                       | 69 (67.0)              | 0.31 (0.16-0.60)\(^a\); 0.34 (0.16-0.71)\(^b\) | <0.01; <0.01 | —                                 | —       | 0.52 (0.27-0.97)                  | 0.04    |
| **Positive social interactions**            |                        |                                       |         |                                   |         |                                   |         |
| <91.7\(^d\)                                | 59 (57.35)             | —                                    | —       | —                                 | —       | —                                 | —       |
| >91.7                                      | 44 (42.7)              | 0.40 (0.16-0.99)\(^b\)              | 0.04    | —                                 | —       | —                                 | —       |
| **Personal experiences**                    |                        |                                       |         |                                   |         |                                   |         |
| Homebound\(^e\)                             |                        |                                       |         |                                   |         |                                   |         |
| No/neutral\(^d\)                           | 37 (36.3)              | —                                    | —       | —                                 | —       | —                                 | —       |
|                              | Yes       | Disagree/neutral | Agree       | Disagree/neutral | Agree       | Disagree/neutral | Agree       |                              |
|------------------------------|-----------|------------------|-------------|------------------|-------------|------------------|-------------|------------------------------|
|                              | 65 (63.7) | 67 (65.0)        | 36 (35.0)   | 34 (33.0)        | 69 (67.0)   | 60 (58.3)        | 43 (41.7)   |                              |
| Uneasiness in the home       |           |                  |             |                  |             |                  |             |                              |
| Disagree/neutral             |           |                  |             |                  |             |                  |             |                              |
| Agree                        |           |                  |             |                  |             |                  |             |                              |
|                              | 3.13 (1.17-8.39) |    | 5.05 (2.35-10.87) | | 3.51 (1.13-10.89) | | 2.64 (1.30-5.34) | |                              |
|                              | (3.72 (1.18-11.72) |    | 5.03 (2.16-11.70) | | 4.68 (1.16-18.90) | | 3.01 (1.35-6.73) | |                              |
|                              | 0.02;      |                  | <0.01;      |                  | 0.03;       |                  | <0.01;      |                              |
|                              | 0.02b      |                  | <0.01b      |                  | 0.03b       |                  | <0.01b      |                              |
|                              |            |                  | 4.15 (1.73-9.97) |                  | 4.80 (2.12-10.88) |                  | 5.15 (1.84-14.42) | |                              |
|                              |            |                  | <0.01       |                  | <0.01       |                  | <0.01       |                              |
|                              |            |                  |             |                  |             |                  |             |                              |
| Lonely/lack of support       |           |                  |             |                  |             |                  |             |                              |
| Disagree/neutral             |           |                  |             |                  |             |                  |             |                              |
| Agree                        |           |                  |             |                  |             |                  |             |                              |
|                              | 4.43 (1.43-13.76) |    | 6.42 (2.84-14.44) | | 5.15 (1.84-14.42) | | 5.15 (1.84-14.42) | |                              |
|                              | 0.01       |                  | <0.01       |                  | <0.01       |                  | <0.01       |                              |
|                              |            |                  |             |                  |             |                  |             |                              |
| Lacking security             |           |                  |             |                  |             |                  |             |                              |
| Disagree/neutral             |           |                  |             |                  |             |                  |             |                              |
| Agree                        |           |                  |             |                  |             |                  |             |                              |
|                              | 0.01       |                  |             |                  |             |                  |             |                              |
|                              |            |                  |             |                  |             |                  |             |                              |

\(^{a}\)Outcome measure was EPDS.
\(^{b}\)Outcome measure was DASS-D – Depression subscale.
\(^{c}\)RR greater than 1 indicates an increase in risk of psychological distress, while an RR less than 1 indicates a decrease in risk of psychological distress;
\(^{d}\)indicate the reference group for each analysis; significance at \(\alpha = 0.05\).
\(^{e}\)\(n = 102\) owing to missing data.

DASS-S: Depression, Anxiety and Stress Scale; EPDS: Edinburgh Postnatal Depression Scale; RR: .