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The Impact of COVID-19 Related Distress on Antenatal Depression in Australia

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Abstract: Globally, the impact of COVID-19 on mental health has been significant. Pregnant women are known to be a vulnerable population in relation to mental health. In Australia, there was an unprecedented demand during the pandemic for mental health services, including services for pregnant women. Maternal mental health has unique and enduring features that can significantly shape a child's overall development and poor maternal mental health can have considerable social and economic costs. This cross-sectional study evaluated antenatal depression and COVID-19 related distress in a sample of two hundred and sixty-nine pregnant women residing in Australia aged between 20 and 43 (M = 31.79, SD = 4.58), as part of a larger study. Social media advertising was used to recruit participants between September 2020 and November 2021. Prevalence rates for antenatal depression were found to be higher in this study (16.4%) compared with previous Australian prevalence rates (7%). COVID-19 distress in relation to having a baby during a COVID-19 outbreak significantly predicted antenatal depression, B = 1.46, p < .001. Results from this study suggest that mothers and families may have increased mental health vulnerabilities as a consequence of the pandemic for some time yet.

Keywords: antenatal depression; COVID-1; pregnancy; women; mental health; Edinburgh Postnatal Depression Scale

1. Introduction

At the beginning of the COVID-19 pandemic swift global action was required to mitigate the spread and impact of the virus. Australia initially responded by employing a suppression strategy using a number of targeted approaches including lockdowns [1]. Lockdowns were enforced across the country in early 2020, coinciding with Australia's first COVID-19 related deaths. Lockdowns continued until the end of 2021 in various parts of the country. The suppression strategy and lockdowns were effective at eliminating the virus in the early stages of the pandemic but there was a substantial social and economic cost, including to the mental health and well-being of citizens [2, 3]. Research on COVID-19 has demonstrated that women have been disproportionally impacted by the pandemic socially, emotionally, and economically [4]. Ordinarily, women are up to twice as likely to experience depression than men and are more vulnerable during childbearing years [5-7]. During the pandemic, the mental health of young women has been among the most impacted [8] with the focus predominantly on mitigation effort and disease control, less attention was given to the impact of the pandemic on mental health.

From a maternal mental health perspective, there is increasing evidence that pregnant women have been significantly impacted by the pandemic. Studies have consistently found antenatal depression rates to be higher during the pandemic than pre-pandemic rates across the globe [9-14] Higher antenatal depression scores have also been found to be associated with disease mitigation measures and COVID-19 related distress across studies [10, 11, 13-15]. In many instances, mitigation efforts were at odds with usual best practice. The way routine care was delivered changed, many appointments were modified (e.g., changed to telehealth or less regular), visitors and support people were minimized

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or restricted altogether and antenatal education cancelled [11, 16-18]. Such measures served to decrease support for mothers at a time where it was most needed. Support is known to be a vital buffer for perinatal mental health issues, together with the standard of maternity care available to women, they have a valuable influence on the well-being of mothers and infants [19-22]. The nature and standard of maternity care provided can significantly reduce rates infant mortality and medical intervention [23]. Optimally women should be able to access a high standard of conventional healthcare that includes comprehensive screening and informal supports including other community health interventions [21]. The mitigation efforts of the pandemic (e.g., lockdowns, reduced appointments, and visitor restrictions) likely compromised the usual systems and supports available to pregnant women in Australia.

Maternal mental health concerns possess unique and potentially enduring features that make them different to other mental health concerns, a consideration that is often misunderstood or overlooked. The perinatal period (typically described as between pregnancy and one year postnatal) is known to be associated with increased vulnerability for mental health concerns [24, 25]. Beginning from pregnancy, the impact of antenatal depression has even been described as a developmental cascade to future mental health problems for both mothers and their children [26]. This begins with an increased likelihood of adverse perinatal outcomes for infants of mothers with antenatal depression. These infants are more likely to be born earlier, have lower birth weight and are less likely to be breastfed exclusively at birth [27]. Mothers who experience depression in pregnancy are also more likely to experience it again during their child's lifetime and are more likely to go on to develop postnatal depression [22, 26, 27]. Children whose mothers have had postnatal depression are more likely to have problems with physical health such as asthma and respiratory problems, impaired immune system responses and neurodevelopmental issues as well as behavioural and emotional concerns such as attention deficit hyperactivity disorder and other [21, 28, 29]. Postnatal depression can impact the quality mother-infant relationships [30, 31], which can led to an increased risk of aggression, emotional difficulties, academic problems and poor self-worth (Powell, Cooper, Hoffman & Marvin, 2013). Due to this enduring impact of poor maternal mental health on infants and children, maternal mental health concerns are a major social and economic issue that should not be underestimated. The long term economic cost of perinatal depression on the community is considerable and the burden on the child is significant (Ayers et al., 2014; Bauer et al., 2014; Eastwood et al., 2017; Gidget Foundation, 2019; Khanlari, Eastwood, et al., 2019; Khanlari, Am, et al., 2019; Milgrom et al., 2008; Sandall et al., 2016; World Health Organisation, 2008, 2018, 2020). For example, one UK study found nearly three-quarters (72%) of the total public health cost relates to adverse impacts on the child, rather than the mother [32]. One way of reducing the social and economic cost is to support women better during pregnancy.

The aim of the current study was to examine the impact of COVID-19 related distress on depression in pregnant women. Understanding the impact of the pandemic on pregnant women may help to inform practices and policy to better support the currently affected cohort in the short-term and also help to inform responses and policy relating to any future health crises.

2. Materials and Methods

2.1. Participants

Paid social media advertising was used to recruit 269 participants (M = 31.79, SD = 4.58, from 23 – 40 years of age), between September 2020 and November 2021, as part of a larger study. Participants were asked to complete an online survey and were offered entry in a draw for a gift voucher as incentive to participate. After reading the information statement at the beginning of the survey, participants were required to click a proceed button in order to continue, indicating consent. The inclusion requirements for participants

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were: (a) 18 years old or over, (b) pregnant, (c) English speaking, and (d) living in Australia. The present project was approved by the relevant Human Research Ethics Committee.

2.2. Sample Characteristics

The sample mostly comprised of Caucasian nulliparous women with a university education planning a hospital birth in urban Australia. Four reported being in a same sex relationship and nine participants were not in a relationship, see Table 1 for further sample characteristics.

2.3. Measures

2.3.1. Edinburgh Postnatal Depression Scale

The Edinburgh Postnatal Depression Scale (EDPS) was used to measure symptoms of antenatal depression [33]. The EPDS is a 10-item self-report questionnaire with a maximum score of 30. Higher scores on the scale indicate higher levels of distress. The EPDS has good reported validity for assessing perinatal distress [34-38]. The EPDS has good reliability and validity [37, 38] including high test-retest reliability in pregnancy [α = 0.82 - 0.84; 35]. The EDPS has also been found to be reliable with women from culturally and linguistically diverse backgrounds [39]. A cut-off score of ≥13 on the EPDS for probable depression was employed in this study, consistent with other Australian studies [33, 40] and other studies focussed on COVID-19 [9]. Pre-pandemic rates of antenatal depression in Australia measured with the EPDS are reported to be around 7% [27, 41, 42].

2.3.2. COVID-19 Distress

At this time of the study development there were no reliable and valid measures of COVID-19 distress. Instead, COVID-19 related distress was measured using a simple two item five-point Likert scale rated from 1 (no concern) to 5 (extremely concerned). Participants were asked "In relation to having your baby, how concerned are you as a result of the COVID-19 outbreak?" and "Overall, how concerned are you as a result of the COVID-19 outbreak?". The two items were found to be correlated with each other (r = .72) indicating reliability for the COVID-19 distress measure.

3. Results

3.1. Data analysis

The Statistical Package for the Social Sciences 27 (SPSS.27) program was used for analyses. The present study was a cross sectional correlational design. Data were checked for accuracy, there were no outliers or missing data.

Scores on the Edinburgh Postnatal Depression Scale were low overall and found to be significantly skewed ($z_{skew} > 3.29$). EDPS scores in a non-clinical sample are expected to be positively skewed, therefore this sample can be considered a true representation of a non-clinical population [27, 33]. In order to address the skewed data, it was decided the most appropriate action for the non-normally distributed variables to was transform them (using SPSS SQRT function), as recommended by Tabachnick and Fidell (2018) for moderately skewed variables. The transformed data did not alter the substantive interpretation of the data, as such the untransformed data was retained in order to make it easier to relate back to the original data (Tabachnick & Fidell, 2018). Pearson's correlation coefficients were calculated to establish the strength of the relationships between each of the variables. A linear regression was then used to conduct a single regression analysis testing whether COVID-19 related distress predicted higher depression scores. The dependent variable was Depression, and the independent variable was COVID-19 distress in relation to having a baby. The COVID-19 distress overall variable was not included in the regression analysis due to multicollinearity. None of the participant demographic characteristics

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were included as there was insufficient distribution across categories. Age was not significantly related to any of the variables and therefore was not included in the analysis.

Table 1. Sample Characteristics (*N* = 269).

Characteristic	*n*	%
Nulliparous	208	77.3
Multiparous	61	22.7
Ethnic Background		
Aboriginal or Torres Strait Islander	2	0.7
White European	186	69.1
Indian	8	3.0
Asian	28	10.4
Middle Eastern	4	1.5
North American	2	0.7
South American	2	0.7
Mixed race	16	5.9
Other	20	7.4
Prefer not to say	1	0.4
Geographical location		
Urban/City	192	71.4
Rural	69	25.7
Remote	8	3.0
In a relationship		
Yes	260	96.7
No	9	3.3
Same sex relationship		
Yes	264	1.5
No	4	98.1
Prefer not to say	1	.4
Education		
No formal qualifications	7	2.6
Completed high school	22	8.2
TAFE certificate/diploma	65	24.2
University degree	175	65.1
Single births	266	98.9
Multiple birth	3	1.1
Birth education classes - yes	157	58.4
Birth education classes - no	112	41.6
Birthing in hospital	244	90.7
Birthing in private birth centre	7	2.6
Birthing in home environment	18	6.7

3.2. Descriptive Statistics

3.2.1. Prevalence of Antenatal Depression

The cut-off for probable depression suggested the prevalence rate for antenatal depression in this sample (*N* = 269) was 16.4% compared with Australia's re-pandemic rate of around 7% [27, 41, 42].

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3.2.2. COVID-19 Related Distress

Overall distress scores indicated the average mother to be 'a little to moderately concerned' (M = 2.60, SD = 1.00) about the impact of COVID-19 on them.

Scores for COVID-19 Distress in relation to having their baby indicated that on average mothers were 'a little to moderately concerned' (2.42, SD = 1.01) about the impact of COVID-19 on their pregnancy and birth.

3.3. Main Analyses

There was a positive association between COVID-19 related distress overall $r(267) = .17$, $p = .005$ and there was also a positive association in relation to having a baby during a COVID-19 outbreak $r(267) = .27$, $p < .001$. Age was not significantly related to either of the key variables (antenatal depression $r(267) < .01$, $p > .05$; COVID-19 in relation to having a baby $r(267) = .01$, $p > .05$. Associations between other categorical characteristics (e.g., location) were not tested due to insufficient variation across categories.

As can be seen in Table 2, the overall regression model was significant, $R^2 = .07$, $F(1, 267) = 20.43$, $p < .001$. It was found that COVID-19 distress in relation to having a baby significantly predicted antenatal depression, $B = 1.46$, $p < .001$. Indicating that distress about COVID-19 in relation to a woman's baby was important an important factor for the experience of antenatal depression during the pandemic.

Table 2. Multiple Regression Analysis Predicting Antenatal Depression from COVID-19 Related Distress in relation to having a baby and overall (N = 269).

Predictor	β	*B*	*SE B*	95% CI for *B*
COVID-19 Distress Baby	0.27	1.46*	0.32	[0.83, 2.10]

* $p < .001$.

4. Discussion

Women in the present study were on average moderately concerned about COVID-19 overall and in relation to their baby during the pandemic. Both COVID-19 distress variables were associated with higher levels of antenatal depression. COVID-19 distress in relation to having a baby significantly predicted symptoms of antenatal depression. Prevalence rates of antenatal depression in this sample were more than twice Australia's pre-pandemic rates, indicating that overall, women were coping poorer than usual. These findings are consistent with outcomes of studies from across a number of other countries, which have found a range of factors to be associated with the observed increased in rates of antenatal depression during the pandemic including: COVID-19 mitigation efforts (e.g., changes to pregnancy care, social distancing), COVID-19 related distress (e.g., exposure to media, COVID-19 case numbers) and existing risk or vulnerability factors [e.g., previous depression, poor social support; 10, 11, 13-15]. Comprehensive maternity care that is of a high standard combined with informal supports are considered to be an important protective influence on maternal mental health [20, 21, 23, 43]. It seems aspects of both the pandemic and the pandemic response evaporated the capacity of these formal and informal systems to provide this comprehensive care, subsequently negatively impacting maternal mental health.

4.1. Limitations, implications, and future research

This study was a cross sectional design with a small sample size drawn from a convenience sample recruited on social media. The majority of participants were Caucasian university educated partnered women from an urban location. The study sample was fairly homogenous and therefore had insufficient power to explore potential influences of participant characteristics such as education or location. Factors such as existing risk factors and more specific COVID-19 related factors were not measured. It is also not possible

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to delineate exactly what aspects of COVID-19 distress in relation to having a baby contributed to the increased antenatal depression scores in the current sample. Moreover, even though antenatal depression prevalence rates in Australia were found to be higher in this sample, overall this finding was much lower than increases observed in other countries [9, 12, 14, 15]. Another Australian study [10] also observed rates much higher (26.5%) than the present study (16.4%). This difference in the Australian studies may reflect the smaller sample size in the present study but also the timing of the data collection may be a factor with the present study data collected over a longer period (September 2020 – November 2021) compared with August 2020 to February 2021 in Lequertier et al.'s study. Australia's vaccine rollout began in February 2021 [44] perhaps this contributed to reducing distress among some women, which was then reflected in the present study. Another difference between the two Australian studies is the rate of public healthcare consumption. In the present study, more than 90% of women were accessing public healthcare, while in the study by Lequertier, McLean [10], only 40.8%. It may be that there was something different that was experienced in public healthcare or that more distressed women chose not to utilise public healthcare. Regardless of these differences, the study by Lequertier, McLean [10] supports the findings of the present study, indicating that COVID-19 related distress in Australian women was associated with increased levels of antenatal depression during 2020 and 2021. Future research may want to explore and unpick what factors contributed most to the COVID-19 related distress, this would help to plan better for any future crises and potentially reduce the impact on maternal mental health.

5. Conclusions

The COVID-19 pandemic was an unprecedented global emergency for modern times. Understanding the impact of the pandemic on maternal mental health is important and valuable in understanding ways to manage any future crises that may impact the treatment of pregnant women. This study and others have consistently found during the pandemic women experienced high levels of distress and these increases in distress were related to being more depressed during pregnancy. Recommendations from other studies suggest that increasing the screening of pregnant women and ramping up of supports may help mitigate the impact of long-term negative outcomes [9, 12, 15], this recommendation will be important for any future global crisis. In terms of the current health crisis, ongoing additional screening and support for women and their children may be important for those families that were pregnant during 2020 and 2021 to avoid and reduce any cascade effect. Programs that support families with health, education and early parenting will be vital in the coming years.

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Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The data presented in this study are openly available in FigShare at 10.6084/m9.figshare.21708551.

Conflicts of Interest: The authors declare no conflict of interest.

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