The transition to parenthood among immigrant parents: A mixed-methods investigation of the prevalence and psychosocial determinants of perinatal psychological distress

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October 9, 2024

A thesis submitted to McGill University in partial fulfillment of the requirements for the degree of Doctor of Philosophy

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Abstract

Expectant parents that have immigrated or come from an immigrant background may face a heightened risk of perinatal distress due to migration-related stressors and barriers to accessing healthcare. Prior research has overlooked psychosocial factors contributing to perinatal distress among immigrant parents, particularly fathers. This dissertation aimed to investigate the prevalence, lived experiences, and psychosocial determinants of perinatal psychological distress and well-being among parents with an immigrant background.

Manuscript one describes the prevalence and early determinants of antenatal depression among recent, long-term immigrant and Canadian-born women. The prevalence of depression was highest for recent immigrants. Among recent immigrants, multiparity, stress and pregnancy-specific anxiety in early pregnancy increased the risk of antenatal depression. Among long-term immigrants, stress in the first trimester was associated with antenatal depression. These findings indicate that women are at risk for antenatal depression, particularly recent immigrant women, and modifiable psychological risk factors may be identified early in pregnancy.

Manuscript two uses a qualitative approach to explore 1st and 2nd-generation immigrant parents' lived experiences of social stressors and facilitators of perinatal psychological well-being. Three key themes emerged: cultural pressures, health and social service access, and discrimination. First-generation immigrant parents reported greater acculturative stress and ethnic discrimination concerns related to their distress. Among men, barriers include feeling as though the paternal role was devalued by society and not receiving consideration during healthcare. Results suggest that parents from immigrant backgrounds perceive social factors to hinder or facilitate perinatal well-being. Our findings highlight the need for continued efforts to

address discrimination, bolstering support for 1st-generation immigrant parents, and to address gender disparities.

Manuscript three describes the prevalence of perinatal psychological distress (depression, anxiety, and stress), and examined antenatal psychosocial determinants of postpartum psychological distress among immigrant (1st and 2nd-generation) and Canadian-born fathers and mothers. Heightened levels of antenatal distress were present among parents regardless of immigrant status and increased at postpartum. A greater severity of postpartum depressive symptoms and prevalence of elevated depressive symptoms at two months postpartum were found among immigrant mothers. Among immigrant fathers, family-work conflict (FWC) increased the risk of depression, and discrimination was associated with stress. For immigrant mothers, FWC increased the risk of depression. FWC and dyadic adjustment was associated with anxiety and stress, and discrimination was associated with stress. Our findings provide further evidence that men are at risk for perinatal distress, and highlight the importance of modifiable psychosocial risk factors for perinatal psychological distress in immigrant and non-immigrant parents.

This dissertation contributes to knowledge on the prevalence and modifiable facilitators and barriers of perinatal psychological well-being, in particular among immigrants. This work can inform tailored, evidence-based programs and policies to address the mental health needs of immigrant and non-immigrant parents and reduce gender disparities in perinatal distress treatment.

Résumé

Des parents qui ont immigré ou d'origine immigrée peuvent être confrontés à un risque accru de détresse périnatale en raison des facteurs de stress liés à la migration et des obstacles à l'accès aux soins de santé. Les recherches antérieures ont négligé les facteurs psychosociaux qui contribuent à la détresse périnatale chez les parents immigrés, en particulier les pères. Cette thèse visait à étudier la prévalence, les expériences vécues et les déterminants psychosociaux de la détresse psychologique périnatale et du bien-être chez les parents d'origine immigrée.

Le premier manuscrit décrit la prévalence et les déterminants précoces de la dépression prénatale chez les femmes immigrantes récentes, de longue date ou nées au Canada. La prévalence de la dépression était plus élevée chez les immigrantes récentes. Chez celles-ci, la multiparité, le stress et l'anxiété spécifique à la grossesse en début de grossesse augmentaient le risque de dépression prénatale. Chez les immigrées de longue date, le stress au cours du premier trimestre était associé à la dépression prénatale. Ces résultats indiquent que les femmes sont exposées au risque de dépression prénatale, en particulier les immigrantes récentes, et que les facteurs de risque psychologiques modifiables peuvent être identifiés dès le début de la période périnatale.

Le deuxième manuscrit utilise une approche qualitative pour explorer les expériences vécues des parents immigrants de 1ère et de 2ème génération face aux facteurs de stress social et aux facilitateurs du bien-être psychologique périnatal. Trois thèmes clés émergent: les pressions culturelles, l'accès aux services sociaux et de santé, et la discrimination. Les parents de 1ère génération ont fait état d'un plus grand stress lié à l'acculturation et de problèmes de discrimination ethnique liés à leur détresse. Chez les hommes, les obstacles comprennent le sentiment que le rôle paternel est dévalorisé par la société et le fait de ne pas être pris en compte

durant les soins de santé périnataux. Les résultats suggèrent que les parents d'origine immigrée perçoivent des facteurs sociaux qui entravent ou facilitent le bien-être périnatal. Nos résultats soulignent la nécessité de poursuivre les efforts pour lutter contre la discrimination, de renforcer le soutien aux parents de 1ère génération et combattre les disparités entre les genres.

Le troisième manuscrit décrit la prévalence de la détresse psychologique périnatale (dépression, anxiété et stress) et examine les déterminants psychosociaux de la détresse psychologique postnatale chez les pères et les mères immigrants (1ère et 2ème génération) ou nés au Canada. Des niveaux élevés de détresse prénatale étaient présents chez les parents, quel que soit leur statut d'immigrant, et augmentaient au cours du post-partum. Une plus grande sévérité de dépression post-partum et prévalence de dépression à deux mois post-partum ont été constatées chez les mères immigrées. Chez les pères immigrés, le conflit famille-travail (CFT) augmente le risque de dépression et la discrimination est associée au stress. Chez les mères immigrées, le CFT augmentait le risque de dépression; le CFT et l'ajustement dyadique étaient associés à l'anxiété et au stress, et la discrimination au stress. Nos résultats fournissent des preuves supplémentaires que les hommes sont à risque de détresse périnatale, et soulignent l'importance de prendre en compte les facteurs de risque psychosociaux modifiables pour la détresse psychologique périnatale chez les parents immigrés et non immigrés.

Cette thèse contribue aux connaissances sur les facilitateurs et les obstacles modifiables au bien-être psychologique périnatal, en particulier chez les parents immigrés. Ce travail peut servir de base à des programmes et des politiques adaptés et fondés sur des données probantes pour répondre aux besoins de santé mentale des parents immigrés et non immigrés et réduire les disparités entre les genres dans le traitement de la détresse périnatale.

Acknowledgments

I am greatly appreciative of the research opportunities and supervisory guidance provided by Dr. Deborah Da Costa. I am grateful for your generous and invaluable mentorship and support over the years. Dr. Blaine Ditto, thank you for your insightful advice that has been instrumental in enhancing the caliber of my research endeavors.

Additionally, I wish to thank my advisory committee members, Dr. Bärbel Knäuper and Dr. Melanie Dirks for their guidance. Thank you to my co-authors, Dr. Jean-Benoît Deville-Stoetzel, Dr. Francine deMontigny, Dr. Diane Dubeau, Dr. Christine Gervais, Dr. Sophie Meunier, and Dr. Tamarha Pierce.

I would like to express my gratitude to the various members of the labs that made this research possible, including lab coordinator Rebecca Wickett, webmaster Michael Raptis, and to my fellow lab mates, Corinne Sejourne, Dr. Serena Mennitto, and Dr. Kristin Horsley. Thank you for being welcoming to the lab and sharing your experience and advice with me.

A special thanks to my graduate cohort and close friends, including Dr. Huma Shireen, Dr. Catalina Enestrom, and Alicia Duval. Thank you for understanding the challenges and rewards inherent in completing a doctoral degree, and for celebrating our achievements together throughout this journey. I look forward to their future accomplishments and promising career paths.

I am grateful to our study participants for generously giving their time to participate in this research and their openness to share about their experiences, without whom this research would not have been possible. Learning from their perspectives has been a consistent source of motivation for my research and I hope to use these insights to make a meaningful impact.

I would also like to acknowledge that the Social Sciences and Humanities Research Council of Canada that provided financial support for this work through a doctoral training award.

Finally, I am deeply grateful to my family for their unwavering love and encouragement. A mi mamá, Carmen, et mon père, Jean-Pierre, thank you for always providing me with the freedom and support to grow and pursue my academic endeavors. I would like to express my appreciation to my brother, Jean-Paul, for his constant encouragement. To Yasmin and Karim, thank you for your love and support. To my husband Michael, for always being my number one fan. Thank you for your patience and support as I worked on completing this dissertation.

Contribution to Original Knowledge

The present dissertation is composed of three studies which contribute to the literature on perinatal psychological distress and well-being among immigrant parents.

Manuscript one contributes to knowledge on the prevalence and early determinants of antenatal depression among recent immigrant, long-term immigrant and Canadian-born mothers. Prior research has largely focused on postnatal mental health with few studies examining depression throughout pregnancy among immigrant women. Similar to previous investigations, recently immigrated mothers reported significantly more elevated antenatal depressive symptoms compared to Canadian-born mothers. Multivariate logistic regressions showed that multiparity, higher stress and pregnancy-specific anxiety in early pregnancy increased the risk of antenatal depression among recent immigrants, while stress in early pregnancy was associated with antenatal depressive symptoms among long-term immigrants. Our study is the first to examine pregnancy-specific anxiety as a risk factor for antenatal depression among immigrant women. This study expands our understanding of risk factors that contribute to elevated rates of depressive symptoms among immigrant women during pregnancy. These findings highlight the importance considering modifiable psychological risk factors for the development of depressive symptoms.

Manuscript two was designed to address key limitations from study one and the literature, such as the exclusion of fathers and the lack of examination of other potential risk factors for mental health that may be particularly salient for parents with an immigrant background. The findings from this study highlight the perceived impact of macro-level social factors that influenced perinatal well-being of first and second-generation immigrant parents, including cultural pressures, health and social service access, and discrimination. Few studies had

considered macro-level contributors to perinatal well-being and generational differences in this population. First and second-generation parents shared many barriers and facilitators influencing psychological well-being. First-generation immigrant parents reported greater adaptation stressors, and ethnic discrimination concerns related to their distress. Among men, barriers included feeling that the paternal role is undervalued by society and that they receive inadequate support during healthcare. Our findings highlighted the need for continued efforts to address discrimination in various settings, bolster support for first-generation immigrant parents, and to address gender disparities.

Manuscript three examined the prevalence and course of depression, anxiety and stress from pregnancy to the postpartum and associated antenatal psychosocial factors that may be particularly relevant for parents with an immigrant background. The investigation of these symptoms and risk factors had received relatively little attention in prior research with immigrant women and had been unexplored among men. Immigrant and Canadian-born parents alike experienced heightened distress levels during the perinatal period, with increases from pregnancy to postpartum and stability during postpartum. Overall prenatal and postpartum psychological distress levels were similar between immigrant and Canadian-born parents. Our findings provide further evidence that men are at risk for perinatal distress. Findings from this study highlight the importance considering modifiable psychological risk factors for the development of psychological distress, such as family-work conflict, dyadic adjustment, and discrimination. This work suggests that future research should place particular attention to how to mitigate past experiences of discrimination, family dynamics, and modify workplace policies to support the mental health of immigrant and non-immigrant parents.

Beyond these contributions, the contents of this dissertation highlight how the multilevel exposure of the couple, the family, and the community can impact individual psychological outcomes during transitional periods. In the general discussion, perspectives on how the knowledge from this work and the literature can inform the development of policies to improve access to culturally appropriate perinatal mental health treatment and support are provided.

Contribution of Authors

This dissertation is comprised of three manuscripts that represent my doctoral work conducted under the supervision of Dr. Deborah Da Costa and Dr. Blaine Ditto, and in collaboration with several mentors and colleagues from the Université du Québec en Outaouais, the Université du Québec à Montréal, and the Université Laval.

Manuscript one was published in the *Journal for Immigrant and Minority Health*. For manuscript one, I was responsible for data analysis, the preparation and writing of manuscript drafts and all aspects of the peer-review process. As primary investigator for the GWG study (A Prospective Study to Evaluate the Impact of Behavioural and Psychosocial Factors on Gestational Weight Gain and Postpartum Weight Retention), Dr. Deborah Da Costa secured grant funding by the Canadian Institutes of Health Research (CIHR, #299916) and, with her research team, was responsible for all aspects of study design and conceptualization, and data preparation. Dr. Da Costa's research team, myself included, carried out participant recruitment and data collection. Dr. Blaine Ditto provided support with manuscript preparation, including editing and mentorship across the peer-review process. Victoria Lane provided support in manuscript editing.

Manuscripts two and three of this thesis were conducted with data collected as part of the Parents Study, which was led by Dr. Deborah Da Costa who secured grant funding by the Social Sciences and Humanities Research Council (SSHRC; #435-2019-1058). I was Dr. Da Costa's research assistant that supported participant recruitment and data collection with other members of her research team. For manuscripts two and three, I was involved with study conceptualization and development, preparation of REB submission documents, data preparation and cleaning, formal data analyses, and the preparation and writing of manuscript drafts, and all aspects of the

peer-review process. Blaine Ditto and Deborah Da Costa provided guidance with study conception, data analysis, and manuscript preparation, including editing, support and mentorship.

For manuscript two, Dr. Jean-Benoît Deville-Stoetzel was involved in the data collection and analysis, and our research collaborators, Dr. Francine deMontigny, Dr. Diane Dubeau, Dr. Christine Gervais, Dr. Sophie Meunier, and Dr. Tamarha Pierce critically reviewed and revised the manuscript and approved the final manuscript, which was published in the *BMC Pregnancy and Childbirth*.

List of Abbreviations

DASS-21	Depression Anxiety and Stress Scale 21
DAS-4	Dyadic Adjustment Scale
EDS	Everyday Discrimination Scale Short Version
EPDS	Edinburgh Postnatal Depression Scale
FWC	Family work conflict
PDQ-R	Prenatal Distress Questionnaire Revised
PPD	Postpartum depression
PSS	Perceived Stress Scale
SPS	Social Provisions Scale
SRQ	Social Roles Questionnaire
WFC	Work-family conflict

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General Introduction

The transition to parenthood is a multifaceted and complex life transition comprised of excitement and fulfillment with substantial psychological (e.g. changes in priorities, worries about the health of the fetus), physical (e.g. pain, fatigue), and social (e.g. changes in family dynamics, work-life balance) challenges. Individuals must adapt to changes in new roles, responsibilities, lifestyle, relationship/family dynamics, and the management of accompanying physical and emotional demands (McCourt, 2006).

According to Statistics Canada, nearly a quarter (25%) of the Canadian population is comprised of immigrants, while approximately one-sixth (17.6%) are second-generation immigrants (Statistics Canada, 2022). These numbers are growing as Canada's new immigration targets are about half a million new immigrants per year (Immigration Refugees and Citizenship Canada, 2024). Migration is now widely recognized as a social determinant of health (Rechel et al., 2013). In addition to regular parental demands, parents who have migrated experience various stressors, such as migratory and acculturative stress (stress related to the process of cultural adaptation (Berry, 1997)), minority discrimination, language barriers and social isolation (Anderson et al., 2017; Jayaweera & Quigley, 2010; Tobin et al., 2018). Immigrant parent's experience of perinatal psychological distress may be worsened because of their lower utilization of maternity-care and mental health services (Ahmed et al., 2017; Higginbottom et al., 2014; Higginbottom et al., 2015; Kirmayer et al., 2007; Merry et al., 2011; Tiwari & Wang, 2008; Whitley et al., 2006). This can be attributed to various barriers, including their unfamiliarity with the health system, cultural preferences, language barriers, the scarcity of culturally tailored therapies, culturally significant stigma and shame surrounding mental illness, and the apprehension of being perceived as unfit parents (Higginbottom et al., 2014; Higginbottom et al.,

2015; Tobin et al., 2018). This puts immigrant parents at a greater risk for antenatal and postnatal psychological distress.

While many of the men and women who immigrate to North America are of reproductive age, little is known about the impact of migratory stress during pregnancy. Research on the psychological adjustment of immigrant groups, especially longitudinal research on recent or expectant parents, is very important for a number of reasons, including that this is a socially important *and* complex topic. The existing body of research on the perinatal experiences of immigrant parents has been almost exclusively conducted among mothers, resulting in a significant gap in understanding the well-being of immigrant fathers during this critical life transition. Although men do not undergo the same physiological changes as women during the perinatal period, they nonetheless experience substantial psychological changes concerning their emerging parental role and associated duties. Disregarding men's emotional experiences of migration and mental well-being in research reinforces the socially constructed misconception that men are invulnerable. This contributes to gender disparities in the screening and treatment of psychological distress during pivotal life transitions, such as parenthood.

The first section of this dissertation begins with an overview of mental health during the perinatal period, and research that shows the greater vulnerability for adverse mental health outcomes among immigrants. Then, an overview of psychosocial determinants (social support/dyadic adjustment, work-family conflict, gender-role attitudes, and discrimination) of mental health are presented, including what is known about how these factors influence mental health among immigrants during the perinatal period.

Prevalence of psychological distress during the perinatal period

Depression

Depression, either symptoms or as a disorder, has most frequently been examined among parents during the perinatal period (pregnancy and 12 months postpartum). Depression is a negative affective state that can range from feelings of sadness to a clinical mood disorder characterized by affective, cognitive, and somatic symptoms, with even subclinical levels impacting functioning (American Psychiatric Association, 2013; VandenBos, 2015). Maternal perinatal depression is prevalent among 11.9% of women (according to diagnostic instruments or symptom scale) (Woody et al., 2017). Some research has identified high levels of depression among fathers (8.4-9.76%) during the perinatal period, with similarly elevated scores of depressive symptoms as mothers (Cameron et al., 2016; Rao et al., 2020).

A growing body of research has demonstrated that postpartum depression (PPD) is highly prevalent among immigrant women, with a prevalence of 20% reported in high-income countries (Anderson et al., 2017; Falah-Hassani et al., 2015), and prevalence rates ranging from 6 to 37% in Canadian studies (Daoud et al., 2019; Dennis et al., 2017; Dennis et al., 2016; Ganann et al., 2016; Mechakra-Tahiri et al., 2007; Saad, 2019; Stewart et al., 2008; Sword et al., 2006; Zelkowitz et al., 2008). Studies have indicated higher risks for both elevated antenatal and postnatal depressive symptoms associated with immigrant status relative to native-born counterparts (Arshad et al., 2021; Falah-Hassani et al., 2015), which has similarly been reported in the Canadian context (Alhasanat & Fry-McComish, 2015; Anderson et al., 2017; Daoud et al., 2019; Dennis et al., 2017; Saad, 2019). For example, a study by Dennis and colleagues (Dennis, Merry, et al., 2017) found that immigrant women reported higher rates of depressive symptoms

postpartum (14.3% among asylum-seekers, 11.5% among refugees, and 5.1% in non-refugee immigrant women) compared to Canadian-born women (2.9%).

Although prior research has predominately focused on postnatal mental health, a growing body of literature suggests that the prevalence of depression during pregnancy is comparable or even higher than PPD (Gavin et al., 2005; Underwood et al., 2016; World Health Organization & United Nations Population Fund, 2009). Systematic reviews suggest that 17-18.4% of pregnant women experience clinically significant levels of depressive symptoms at some point during their pregnancy, with 13% experiencing major depression (Gavin et al., 2005; Underwood et al., 2016).

While antenatal depression has been identified as one of the strongest determinants of PPD (Robertson et al., 2004; Underwood et al., 2016; Underwood et al., 2017; Verreault et al., 2014), few studies have examined depression throughout pregnancy among immigrant women, with most examining these symptoms only in the third trimester of pregnancy (Underwood et al., 2017; Waldie et al., 2015). A recent meta-analysis of sixteen studies, among immigrant women, found a high prevalence (12%-45%) of clinically significant depressive symptoms during pregnancy (measured with self-report questionnaires) (Anderson et al., 2017). In a Canadian study with 119 pregnant immigrant women, 42% of participants reported clinically significant symptoms of depression (EPDS >12) (Zelkowitz et al., 2004). Another Canadian study found that immigrant women reported a higher prevalence of antenatal depressive symptoms regardless of their time since immigration (Miszkurka et al., 2010).

Mental health research among immigrant fathers during the perinatal period is extremely scarce. In North America, mental health of immigrant fathers and the impact of immigration on fatherhood has been primarily studied among Mexican American fathers (Capps et al., 2010;

Roubinov et al., 2014). In a study of Mexican American men, a prevalence of 9% was reported for postpartum depression (Roubinov et al., 2014). In a population-based study in Australia among fathers of children aged 4-5, refugee fathers or those who migrated from non-English-speaking countries reported greater psychological distress than Australian-born fathers (Giallo et al., 2017). Therefore, it would be important to examine distress among immigrant fathers during the transition to parenthood as well.

Anxiety

Anxiety is a feeling of apprehension, marked by "somatic symptoms of tension" and intrusive worried thoughts (Davey, 2010; VandenBos, 2015). Anxiety is similarly prevalent among expecting parents. Among women, a pooled prevalence for any anxiety disorder was 15.2% antenatally and 9.9% postnatally, and the prevalence for anxiety symptoms was 22.9% antenatally and 15.0% postnatally (Dennis, Falah-Hassani, et al., 2017). Some research has identified high levels of anxiety among fathers during the perinatal period (Leach et al., 2016). Among men, estimates of the prevalence of anxiety symptoms have been between 3.4% and 25.0% during the antenatal period and 2.4% and 51.0% during the postnatal period (for meta-analysis and review, Leiferman et al., 2021; Philpott et al., 2019).

Perinatal anxiety among immigrant populations has received less attention than depression (Fellmeth et al., 2017). A systematic review published in 2017 identified three studies that examined the prevalence of anxiety in this population, and these studies used combined measures of depression and anxiety (i.e. Delusions-Symptoms-States-Inventory: States of Anxiety and Depression (DSSI-SAD) scale and Hopkins Symptoms Checklist (HSCL-25)), which makes it difficult to distinguish the prevalence of anxiety accurately (Fellmeth et al., 2017). An Australian study reported severe anxiety or panic attacks during the first 3 months

postpartum among 16.4% of immigrant mothers (Lansakara et al., 2010). A more recent study among immigrant Mexican women in the US reported that 23% of women scored within the moderate to extreme anxiety symptom range during the postpartum (Farina et al., 2020).

Compared to non-immigrant counterparts, a greater vulnerability to anxiety during this period has also been found among immigrant women (Alati et al., 2004; Dennis, Brown, et al., 2018; Yelland et al., 2010). A Canadian study by Dennis and colleagues (Dennis, Brown, et al., 2018) reported greater symptoms of postpartum anxiety among recent and nonrecent Chinese immigrant women (23.7% and 23.2% at 4 weeks, 19.8% and 20.4% at 12 weeks, 19.7% and 22.5% at 52 weeks, respectively) compared to their Canadian-born Chinese counterparts (15% at 4 weeks, 4.4% at 12 weeks, 6.1% at 52 weeks). Higher levels of pregnancy-related anxiety among pregnant Mexican immigrant women (according to the Pregnancy-related Anxiety Scale) compared to Mexican-American women (19.6 ±4.8 vs 15.6 ±4.7, respectively) have been found in the US (Fleuriet & Sunil, 2014). Similarly, an Australian study reported a greater likelihood of reporting anxiety symptoms at 6 months postpartum among immigrant women born in a country where English is not the primary community language compared to women born in Australia (Yelland et al., 2010).

Stress

Stress is a complex construct that typically refers either to the perception of threat or to the psychological, behavioural, and/or physiological responses that individuals exhibit in response to challenging environmental situations, i.e., stressors (Lazarus, 1966; VandenBos, 2015). Most expectant parents experience stress due to new challenges and responsibilities associated to their familial role, changes in their home, and interactions with health care personnel (Zauderer, 2009). Stress during the perinatal period has been studied with measures of

perceived stress, stressful life events, and pregnancy-specific stress (Cardwell, 2013). A Canadian study reported that 12% of women experienced high levels of perceived stress during pregnancy and 17.1% had three or more stressful life events within the year before their infant's birth (Kingston et al., 2012). Among men, between 6-8.7% report stress during pregnancy (Wee et al., 2015).

A qualitative study conducted in Canada, found high levels of loneliness and stress among refugee parents during the postpartum period (Stewart et al., 2015). However, studies that have examined the prevalence of perinatal stress among immigrants have primarily been in Hispanic populations. A small cross-sectional study from Spain reported greater scores of perceived stress at 4 months postpartum among immigrant women compared to Spanish-born women (Pérez-Ramírez et al., 2013). However, a more recent study from the same researcher did not find significant differences between perceived stress during the postpartum between Spanish and foreign-born women (Pérez-Ramírez et al., 2017). Similarly, while Mexican immigrant women in the United States had higher levels of pregnancy-specific anxiety than Mexican American women, they reported lower levels of perceived social stress (Fleuriet & Sunil, 2014). Another American study also found that women with parents born in Puerto Rico or Dominican Republic (i.e. second generation) had a 40% greater risk of high stress than the women that immigrated from these countries (Silveira et al., 2013). The greater stress that has been reported in some of these studies among minority ethnicity women may be due to differences in their amount of exposure to discrimination (further discussed in the section about "Determinants of psychological distress during the perinatal period").

Trajectories of psychological distress across the perinatal period

Depression

The extent to which psychological distress remains stable over time during pregnancy and the postpartum has been studied inconsistently, with the exception of depression. The literature suggests a heterogeneity in trajectories of perinatal depression, differing according to severity of symptoms, stability, timing (prenatal or postpartum), and the population studied (Bayrampour et al., 2016; Santos et al., 2017; Wikman et al., 2020; Yonkers et al., 2001). A systematic review on maternal perinatal depression suggests that most studies commonly found three distinct trajectories, with a stable low/no depression trajectory with the largest group size and a chronic high depression group, which was generally the smallest group (Santos et al., 2017). Another systematic review of studies using growth curve mixture modeling to examine maternal depression throughout the perinatal period reported a stable low trajectory group and a stable moderate-high trajectory in most studies (Baron et al., 2017). Fewer studies have examined the trajectories of symptoms of depression among men during the perinatal period. A recent study among a population-based longitudinal birth cohort in Finland reported three stable depressive symptom trajectories from pregnancy to two years postpartum among both women and men (low symptom trajectory in 63.1% and 74.9%; moderate symptom trajectory in 28.1% and 22.6%; high symptom trajectory in 8.8% and 2.6%, of women and men, respectively) (Kiviruusu et al., 2020).

The course of antenatal depression throughout pregnancy has received relatively little attention in this population. A Canadian study reported that 15% of immigrant women scored above the clinical cut-off (12 > EPDS) during pregnancy, and they no longer reported clinical levels of depression at 2 months postpartum (Zelkowitz et al., 2008). However, 25% of

immigrant women reported clinically significant levels of depressive symptoms during pregnancy that persisted when measured at 2 months postpartum (Zelkowitz et al., 2008). A more recent Canadian study (Chow et al., 2019) examined the trajectories of depressive symptoms throughout the perinatal period (27 weeks of pregnancy to 24 months postpartum) among 3307 immigrant women recruited in several cities across the country (Edmonton, Toronto, Vancouver, Winnipeg, Morden, and Winkler). Five different symptoms trajectories were found, with the majority of women not experiencing significantly elevated symptoms of depression throughout the perinatal period (58.4% very low and 27.3% moderately low levels of depressive symptoms that are less than clinical cut-off score), and 5.4% with high depressive symptoms only during pregnancy, 6.7% with high depressive symptoms only in the postpartum, and 2.3% with high and persistent depressive symptoms throughout pregnancy and the postpartum (Chow et al., 2019). A greater risk for persistent depression was found among immigrants that have been living in Canada for 5-10 years, but not among more recently migrated women (Chow et al., 2019).

Across the postpartum, a meta-analysis reported that the prevalence of maternal depressive symptoms among immigrants does not change (22% between 1 and 4 weeks, 19% between 5 and 12 weeks, and 21% between 13 and 52 weeks postpartum) (Falah-Hassani et al., 2015). However, a few more recent Canadian studies have found a decrease in symptoms over the postpartum period (4 weeks to 1 year postpartum) (Dennis, Brown, et al., 2018; Dennis et al., 2016; Ganann et al., 2016). For example, Dennis and colleagues (2016) found a decrease in prevalence of major postpartum depressive symptoms (EPDS>12) with only 1.4 % of refugees; 4.3 % of asylum-seekers; 3.0 % of non-refugee immigrants; and 1.0 % of Canadian-born women reporting major depressive symptoms at the same level at 16 weeks as they scored at 1 week

postpartum (Dennis et al., 2016). Another study by the same researcher, also reported a decrease in depressive symptoms from 4 weeks to 1 year postpartum among Chinese immigrant women (i.e. 42.0% or less continued to have symptoms at 12 weeks and 17.4% or less at 52 weeks) (Dennis, Brown, et al., 2018).

Anxiety

Few studies have examined the course of symptoms of anxiety or anxiety disorders during the perinatal period. The available evidence is conflicting, with some studies reporting stability (Ahmed et al., 2018; Don et al., 2014; Schubert et al., 2017) and others a decrease (Agrati et al., 2015; Buist et al., 2011; Don et al., 2014; Howard et al., 2014; Viswasam et al., 2020) over time. Among men, the course of anxiety (either confirmed by diagnostic clinical interviews or above cut-off points on self-report symptom scales) across the perinatal period is fairly stable with some reporting decreases postpartum (Leach et al., 2016).

Research on the course of symptoms of parental anxiety among immigrants is limited. An Australian study that examined symptoms of anxiety among Filipino-born mothers reported a stability in mean number of anxiety symptoms from pregnancy (2.42) to 5 years later (2.67) (Alati et al., 2004). A Canadian study by Dennis and colleagues (Dennis, Brown, et al., 2018) among Chinese Canadian women (both immigrants and Canadian-born) reported a decrease of postpartum anxiety symptoms over time. Among Chinese women that reported symptoms of anxiety at 4 weeks postpartum, 42.0% had symptoms at 12 weeks and 17.4% at 52 weeks. However, another study from the same researcher (Dennis, Brennenstuhl, et al., 2018) among Chinese Canadian women (82% immigrant) reported three trajectories during the first year postpartum, two of the larger groups included stability over time; a stable/low levels of anxiety group (74.0%) and a consistently clinically anxious group from baseline and throughout

the postpartum (19.5%). The third group reported high anxiety at baseline with a significant decline in symptoms over time (6.5%).

Stress

It is unclear if women experience stable stress during the perinatal period as limited research has been conducted on trajectories of perinatal stress. Among women, trajectories that have been reported include stable symptoms of stress (low, moderate, high stress trajectories) (Lim et al., 2020; Mughal et al., 2018), or U-shaped trajectories with higher stress in first trimester, lower in mid-pregnancy, and increasing at late pregnancy or after birth (Da Costa et al., 1999; Liou et al., 2014; Monk et al., 2020; Rallis et al., 2014). Among fathers, stress has been found to increase from pregnancy to birth, with a subsequent decrease in the postpartum (for review, Philpott et al., 2019).

Research on the course of symptoms of parental stress among immigrant parents during the perinatal period is particularly scarce. Perceived stress scores were found to significantly decrease from early pregnancy to mid-and late pregnancy among immigrant Hispanic women (45.6 %) and non-immigrant Hispanic women from second (45.6%) or third (5.5%) generation migration to the US (Silveira et al., 2013). A recent Canadian study examined the trajectories of perceived stress throughout the perinatal period (27 weeks of pregnancy to 24 months postpartum) among 3307 immigrant women from across the country (Chow et al., 2019). Five different symptom trajectories were found, with the majority of women not experiencing significantly elevated perceived stress throughout the perinatal period (22.7% low levels and 42.4% moderately low perceived stress that were always less than cut-off score). However, 23.1% of women reported high perceived stress in the postpartum, 4.5% reported high perceived

stress in the antepartum, and 7.3% reported persistently high perceived stress across the perinatal period (Chow et al., 2019).

The trajectories of symptoms of perinatal depression, anxiety, and stress among immigrant fathers have not been examined to date.

Determinants of psychological distress during the perinatal period

Researchers have called for a greater attention to social determinants of health, as well as the identification of protective mechanisms through longitudinal and qualitative approaches (McQuaid et al., 2017; Nguyen & Benet-Martínez, 2013). Considering the increasing size of the population in Canada that has an immigrant background, and this group's vulnerability to certain adverse mental well-being outcomes, research with a greater focus on psychosocial determinants of perinatal well-being is important for preventative strategies aimed at improving antenatal screening and treatment. This is particularly salient as even relatively mild or moderate levels of perinatal psychological distress have consistently been demonstrated to adversely impact the physical and psychological well-being of parents and their children (Cheng et al., 2006; Kingston et al., 2012; Lupien et al., 2009; Staneva et al., 2015; Wisner et al., 2013).

In addition to the common stressors experienced by many expecting families such as unplanned pregnancy, obstetric complications, child-related difficulties (e.g. child difficulties, child care issues, health of their baby), and financial stress (e.g. food insecurity, work-family conflict) (Augusto et al., 2020; Chhabra et al., 2020; Lancaster et al., 2010; Marcus et al., 2003; Philpott et al., 2019; Rubertsson et al., 2005; Truijens et al., 2017), there are a number of potential contributors to psychological distress that are particularly relevant and even distinct to immigrant women and men. The remainder of this section will focus on these processes.

Gender role attitudes

Gender stereotypes are generalizations about characteristics and roles specifically associated with a gender (i.e. reflecting how men and women are expected to act) (Richardson, 2015). Traditionally, men were expected to provide for the family financially and be the authoritarian or disciplinarian parental figure, while women were expected to engage in childcare and domestic labour (Hodges & Park, 2013; Wall & Arnold, 2007). There has been a cultural shift in gender roles in Western societies, including for parenting. Parental roles have become less polarized due to the shift of both partners contributing to various dimensions of family life (e.g. financially, domestic labour, household activities, and childcare) (Lamb, 2004; May et al., 1996). Some studies that have examined parental gender stereotypes reported that women hold less traditional attitudes about gender compared to men (Blakemore & Hill, 2008; Tenenbaum & Leaper, 2002). However, some evidence suggests an increase in traditional family roles after the birth of a child among parents (Kluwer et al., 2002). Similarly, a recent study among couples during the transition to parenthood suggests that despite the Western shift of sharing family and work responsibilities, women value the parent role higher than men, and men deemed their work role to be more salient to their identity (Kaźmierczak & Karasiewicz, 2019).

Bem suggests that gender-typed individuals have a greater difficulty to adapt to demands of different situations because of their rigid adherence to stereotypical gender roles (Bem, 1981; Bem & Lewis, 1975). Gender role stereotypes may amplify role differences and social inequalities (Naomi, 2018). Women may experience distress and social isolation in wanting to fulfill work-related roles, while remaining highly involved in child-care (Büskens, 2001). Given the social shift towards increased expectations of greater paternal involvement, those with greater traditional gender attitudes may find it difficult to adapt to their new role as a father as

they may feel a lack of competence and parenting skills, which may lead to symptoms of psychological distress (Kim & Swain, 2007). Men with greater traditional gender attitudes may also be less likely to seek mental health services to cope with their emotional problems (Ang et al., 2004; Berger et al., 2013; Holzinger et al., 2012), and when they do, they may have poorer engagement and retention in psychotherapy (Primack et al., 2010). Partner's practical or tangible support following childbirth, including childcare and household labour, reduces the risk of perinatal depression (Pilkington et al., 2015). Therefore, it is important to consider gender role attitudes when studying parental mental health during the transition to parenthood.

Gender role attitudes have primarily been studied when examining its impact in outcomes on offspring, such as children's gender development (Endendijk et al., 2018). However, some data suggests that gender role stress is a risk factor for perinatal depression among men and women (Chhabra et al., 2020; Morse et al., 2000), and perinatal anxiety among men (Chhabra et al., 2020). Parents that come from backgrounds that hold more traditional gender roles may have increased gender-role conflicts during the perinatal period that could affect mental health. For example, the Latino culture is a male-dominated culture that has a more traditional view on gender roles (DiGirolamo & Salgado de Snyder, 2008; Loving et al., 2001). Studies among Latina mothers have found a greater risk of prenatal anxiety among women with a higher adherence to traditional gender roles (Lara-Cinisomo et al., 2020) and greater postpartum depressive symptoms among women with lower antenatal social support that have a higher adherence to traditional gender roles (Albuja et al., 2017). Similarly, a recent study found that greater egalitarianism was associated with a decrease in postpartum depressive symptoms among Latino fathers (Paredes & Parchment, 2021).

Examining gender roles may be even more crucial among immigrant parents as the experience of migration may include shifts in familial roles and gender-role conflicts. For example, a recently immigrated man may experience discrimination, limited work opportunities, or power differentials in relation to their partner, which may cause distress and adversely impact self-worth (Noh et al., 2007). A qualitative study conducted in Canada, found that African refugee parents reported marital discord during the postpartum due to new gender roles (Stewart et al., 2015). Parents reported that single-parent households became more common due to the difficulties parents had in negotiating new gender roles within Canadian society (Stewart et al., 2015). Some data suggests that difficulties in fulfilling gender roles may be a contributing factor to PPD among immigrant mothers (Schmied et al., 2017; Wittkowski et al., 2017).

Social Support and Dyadic Adjustment

Social support refers to the tangible or perceived availability of emotional, instrumental or informational support that people receive from others. The current literature has consistently identified the significant role of social support and couple relationship/adjustment on symptoms of perinatal depression (Bayrampour et al., 2016; Biaggi et al., 2016; Da Costa et al., 2017; Harandi et al., 2017; Hughes et al., 2020; Kim et al., 2014; Kiviruusu et al., 2020; O'Hara & McCabe, 2013; Singley & Edwards, 2015; Wee et al., 2011), anxiety (Bayrampour et al., 2016; Biaggi et al., 2016; Hughes et al., 2020; Philpott et al., 2019), and perceived stress (Kingston et al., 2012; Razurel et al., 2013), as a psychosocial risk factor when it is found to be poor, and as an important protective factor or buffer of distress when it is perceived as satisfactory by individuals (Razurel et al., 2013).

Social support can be a resource for coping with stress, including stressors related to immigration (Harandi et al., 2017; Lee et al., 2012). In a women’s country of origin, the support

of family and friends during the perinatal period may be culturally expected and valued (Landale & Oropesa, 2001; Martinez-Schallmoser et al., 2005; Martinez-Schallmoser et al., 2003). Parents who have migrated may have poorer social support because of the loss or separation from their social networks and social isolation in the new country due to difficulties in forming new networks. The literature among immigrant women has identified poor social support, couple relationship/adjustment, loneliness and isolation as important risk factors for perinatal depression (Alhasanat & Fry-McComish, 2015; Anderson et al., 2017; Diaz et al., 2007; Falah-Hassani et al., 2015; Nilaweera et al., 2014; Shin & Shin, 2015; Small et al., 2003; Tobin et al., 2018; Wittkowski et al., 2017; Xiong & Deng, 2020; Zelkowitz et al., 2004). For example, a systematic review of studies among women that migrated from low- and middle-income countries reported higher social support (assessed as emotional, practical, and/or informational support), as a protective factor against PPD development (Fellmeth et al., 2017). Findings from a meta-ethnographic study suggest that immigrant women view symptoms of PPD as a response to common migrant stressors, such as the separation from their community and social isolation (Schmied et al., 2017). Moreover, the absence of family and their support for cultural postpartum practices were identified as risk factors for developing PPD among Cambodian immigrant women living in Australia (Hoban & Liamputtong, 2013).

A recent review of Canadian studies that examined PPD by immigrant status has similarly suggested that social support may be a key mechanism underlying increased PPD among immigrants (Saad, 2019). Many studies conducted in Canada have found that poor social support or smaller social networks are strongly associated with perinatal depression among immigrant women (Daoud et al., 2019; Ganann et al., 2016; Peer et al., 2013; Zelkowitz et al., 2004), even after adjusting for socio-economic status (Daoud et al., 2019; Dennis, Merry, et al.,

2017; Ganann et al., 2016). For example, a prospective Canadian cohort study found that migrant women who reported a sense of community belonging and higher levels of social support had a lower risk of developing symptoms of PPD (Dennis, Merry, et al., 2017).

Similarly, some studies have suggested a mediating effect of couple adjustment and social support on the relationship between stress or stressful life events and antenatal depressive symptoms among immigrant women (Coburn et al., 2016; Glazier et al., 2004; Zelkowitz et al., 2004) as well as direct associations between couple adjustment and postpartum depressive symptoms in immigrant women (Zelkowitz et al., 2008). A strain could occur in immigrant women's couple relationship as they may require greater support from their partner during this period because they do not have access to most of their social network. This can create a challenging shift in roles for men who come from a background where women relatives are traditionally expected to provide this support (Schmied et al., 2017). A recent study of Black African immigrant women in Canada found spousal support as an important factor to benefit postpartum mental health (Baiden & Evans, 2020). Some evidence suggests that partner support mediates social inequalities (i.e. education, income, employment) associated with PPD among migrant women, with satisfying partner support during pregnancy significantly reducing symptoms of depression (Nakamura et al., 2020).

Nonetheless, information is limited regarding the effects of social support on ethnic minority parents and immigrant parents in Canada, who are at high risk for experiencing socioeconomic disadvantage and stressful life events. Moreover, there is a lack of evidence examining the effect of social support on symptoms of perinatal anxiety and stress among immigrant mothers and fathers (Nilaweera et al., 2014).

Family-Work Conflict

Work-family conflict occurs when an individual experiences incompatible demands between work and family domains (Greenhaus & Beutell, 1985). In the literature, two types of work-family conflict have been identified: (a) work-family conflict (WFC) is a form of inter-role conflict where the demands and obligations from one's work role interfere with family life, causing difficulties to fulfill family responsibilities (Greenhaus & Beutell, 1985; Greenhaus & Powell, 2006) and (b) family-work conflict (FWC) is a form of inter-role conflict where family commitments and demands interfere with work responsibilities (Greenhaus & Beutell, 1985; Greenhaus & Powell, 2006). Existing literature suggests that each type of conflict are separate constructs, each with its own unique antecedents and consequences (Byron, 2005; Hammer et al., 2004; Michel et al., 2011; Noor, 2004).

Over the past several decades, women have represented a growing segment of the workforce worldwide. Women's workforce participation rates in numerous countries are now approaching equivalence to those of men (Ortiz-Ospina et al., 2024), with many returning to work after childbirth. In Canada, 81.7% of women and 87.7% of men between the ages of 25 to 44 were employed (Statistics Canada, 2024). Work-family conflict is a relevant issue in our society given the societal trend of increasing number of dual-earner couples (Statistics Canada, 2016b) and women's evolving roles within the workforce (Losoncz & Bortolotto, 2009; Marshall & Tracy, 2009). The literature has demonstrated how these societal changes drive an escalation of WFC and FWC, and subsequently the negative consequences on psychological well-being and distress (e.g. depression, anxiety, substance abuse, stress) in the general population (Amstad et al., 2011; Bilodeau et al., 2020; Borgmann et al., 2019; Darolia et al., 2019; Elahi et al., 2022; McCardel et al., 2022; Minnotte & Yucel, 2018; Molina, 2021; Reimann & Diewald, 2022).

The perinatal period marks a transitional period where many parents must juggle the competing demands of new time-consuming parental responsibilities, and for many this includes employment demands that can be particularly taxing. The current literature has consistently identified the significant roles of WFC and FWC on worse general mental health and symptoms of depression and anxiety among women in the postpartum (Grice et al., 2007; Grice et al., 2011; Killien et al., 2001). While, few prospective studies have examined the role of antenatal work-family conflict on postpartum mental health outcomes, a large Norwegian Cohort Study among women found that antenatal work stress (e.g. employment autonomy, working relationships, and work enjoyment) at 17 weeks' gestation was associated with a 33% greater risk of subsequent depression and anxiety at 30 weeks' gestation and a 44% greater risk at 6 months postpartum (Clayborne et al., 2022). Another recent study found that greater pregnancy-to-work conflict (i.e. task-related demands of pregnancy perceived to make it more difficult to successfully fulfill work role tasks) was associated with decreased levels of positive affect in employees at six months postpartum (Arena et al., 2021).

Although interest in work–family conflict has grown over time, most perinatal work-family research has primarily focused on mothers (Dagher et al., 2011; Frye & Breaugh, 2004; Goodman & Crouter, 2009; Grice et al., 2007; Grice et al., 2011; Marshall & Tracy, 2009). This has left a gap in understanding fathers' work-family experiences (Fischer & Anderson, 2012; Mitchell et al., 2007), which is significant since many fathers are now taking on a more active parent role (Pleck, 2010) and highly value their caregiving role (Hofmeister & Baur, 2015). As fathers take on more caregiving responsibilities, it can clash with their previous work role and potentially increase the chances of experiencing family–work conflict. As men shift towards caregiver-provider dual roles, examining the perceived tension between family and work for

fathers warrant further research. Given the difference in parental policies across countries, it is important to conduct research in a Canadian context among this understudied segment of the population. More than 70% of fathers have reported experiencing medium to great work-family interference in at least one direction, with approximately 20% primarily FWC (Li & Zerle-Elsässer, 2023). Among fathers, WFC has been associated with a greater risk of perinatal depression (Chhabra et al., 2020; Koh et al., 2014; Top et al., 2016) and FWC with perinatal depression and anxiety (Chhabra et al., 2022).

Much of the research that has examined work-related stress and mental health outcomes among expecting or new parents have been conducted using cross-sectional designs (Cooklin et al., 2015; Grice et al., 2007; Koh et al., 2014; McGovern et al., 2007; Shepherd-Banigan et al., 2016) and focused on WFC and not FWC (Matijaš et al., 2024). In this dissertation we will focus on the latter. FWC can result in considerable stress impacting both work and family domains (Amstad et al., 2011). Emerging research suggests that the often-overlooked conflicts in the family-to-work direction should not be ignored due to their significant mental health consequences (Reimann & Diewald, 2022). With the growth of communicative technologies, familial concerns may more readily infiltrate the work sphere (Wajcman et al., 2008). Despite the rise in parents' overall work commitments, a recent US Surgeon General report reports that parents have also increased the amount of time they spend dedicated to primary childcare responsibilities, by 40% for mothers and 154% for fathers (US Surgeon General, 2024).

We have limited knowledge about how work-family conflicts impact our increasingly diverse workforce. The literature on work-family conflict has been primarily conducted among white and non-immigrant samples (for review, Lin & Lin, 2021). The few studies that have examined work-family conflict among immigrants have found associations between WFC and

poor mental health outcomes (e.g. symptoms of anxiety, depression, stress) (Lin & Lin, 2021). More specifically, research suggests that the immigrant experience shapes parents' negotiation of work and family responsibilities in unique ways by factors, such as, cultural assumptions about employment, experiences of discrimination, loss of social support, and different gender role dynamics (Lin & Lin, 2021). Examining FWC may be particularly important among immigrant parents as the experience of migration may involve changes in familial roles and gender-role conflicts. Given the importance placed upon family responsibilities and greater family pressures experienced by many immigrant families, more research is needed to examine how FWC impacts mental health in these groups (Rudolph et al., 2014).

Discrimination

Discrimination is defined by the American Psychological Association as "the unfair or prejudicial treatment of people and groups based on characteristics such as race" (American Psychological Association, 2019), which can also include country of origin, language, or religion. Discrimination takes place at the individual level through daily interactions with other members of the community and at the structural level (Ayón, 2015). Exposure to discrimination is known to negatively affect mental health (increase of symptoms and disorders) in the general population (Williams et al., 2003; Williams et al., 1997) and among immigrants (George et al., 2015; Szaflarski & Bauldry, 2019). Despite the awareness of discrimination as a potentially important risk factor for the deterioration of well-being (Schmitt et al., 2014), investigations of the unique experiences and consequences of discrimination among immigrants remains limited (Hyman, 2009; Kirmayer et al., 2011). Notably, a study that used data from the Longitudinal Survey of Immigrants to Canada suggests that visible minorities and immigrants that experience discrimination have a greater risk of decline in self-reported physical and mental health

compared to other immigrants (De Maio & Kemp, 2010). It has been suggested that poor health outcomes among long-term immigrants may be due to greater exposure to discrimination, however this requires further evidence (Beiser, 2005; Edge & Newbold, 2013; Lee et al., 2013; Noh & Kaspar, 2003).

While the relationship between discrimination and perinatal depression, anxiety and stress remains understudied, discrimination has been found to be associated with a greater risk for preterm birth, low birth weight, and PPD in studies of ethnic minority women (Alhusen et al., 2016; Ponting et al., 2020; Weeks et al., 2022). A recent study from the UK reported an increased risk of psychological distress (self-reported treatment for depression or anxiety) among migrant women during the first postnatal year (Moore et al., 2019). In North America, some studies have found discrimination to be associated with perinatal depressive symptoms among African Americans in the US (Canady et al., 2008; Ertel et al., 2012; Rosenthal et al., 2015). Similarly, a Canadian study reported that women who identify with an ethnic minority group were more likely to report symptoms of depression (9.8% vs 5.9%), anxiety (22.9% vs 17%), perceived stress (28.9 % to 19.7 %), and inadequate social support (28.8% vs 9.8%) during pregnancy than women who identified as White (Robinson et al., 2016).

However, discrimination is not only associated with ethnicity but also with migrant status. Immigrant parents may be exposed to experiences of discrimination during the perinatal period due to the increased exposure to health care settings. A Canadian study reported that 65% of immigrants have experienced discrimination when visiting a health care clinic (Pollock et al., 2012). More specifically, there is evidence suggesting discrimination among immigrant women within Canadian maternity care settings (Baiden & Evans, 2020; Reitmanova & Gustafson, 2008). Discrimination towards immigrant women in maternal health care settings has been

reported in other high-income countries as well (Alhusen et al., 2016; Kita et al., 2015; da Conceição & Figueiredo, 2015). There is also evidence from a qualitative Canadian study among immigrant and refugee women suggesting that discriminatory attitudes at a partner's workplace is a factor that negatively affects the well-being of the whole family (O'Mahony et al., 2013). In the US, most investigations conducted with immigrants have been among Hispanic women (both foreign- and US-born) and have found that greater frequency or level of discrimination is a predictor of greater symptoms of depression in the perinatal period (Ponting et al., 2020; Walker et al., 2012). While the studies that have examined this issue have been primarily with women and on depression, one recent study did not find discrimination to be related to maternal symptoms of anxiety (Mahrer et al., 2020).

Since discrimination may contribute to depression, there is an emergent need to further explore the relationship between discrimination and symptoms of depression, anxiety and stress among expecting immigrant parents from various ethnicities in order to better understand the role of discrimination in perpetuating intergenerational ethnic inequities in health.

The Current Dissertation

This research based its theoretical foundation on the Ecosocial Theory that focuses on determinants of social inequalities in health (Krieger, 2014). A core concept of this theory is how psychological and biological factors respond to and are changed by social conditions over time (Krieger, 2014). Notably, this framework interprets mental health outcomes by accounting for social forces, which explains how there are different distributions of health outcomes within a population (i.e. certain social groups are more disadvantaged compared to others). Rather than using a framework that justifies group differences in health outcomes, this approach permits to question the impact of social factors such as discrimination and social inequality on health (Peng,

2009). Given the aim of this work to understand the complex causes of mental health outcomes, this theory offers a comprehensive framework to examine how experiences at the interpersonal and community levels may cause changes in parent's mental health during pregnancy and the postpartum. The model is useful to consider how multiple determinants in synergy can provide a more holistic view of mental illness causation. The research objectives and hypotheses of this work were guided by the key tenets of the Ecosocial Theory. Firstly, by considering how social experiences can cause psychological outcomes. Secondly, by considering how the multilevel exposure of the family (microsystem) within the community (exosystem) can directly impact individual mental health outcomes. Lastly, the life course perspective recognizes that experiences, such as discrimination, remain relevant for health outcomes years later (Krieger, 1994, 2001a, 2001b).

This dissertation is comprised of three manuscripts that contribute to the understanding of mental health among immigrant parents during the transitional period into parenthood, as well as the influence of psychological and social risk factors on immigrant parents' mental health. Manuscript one sought to describe the prevalence and early determinants of depression during pregnancy among recent immigrant and long-term immigrant women, compared to Canadian-born women. Manuscript two was designed to address key limitations from study one and the literature, such as the exclusion of fathers and the lack of examination other potential risk factors for mental health that may be particularly salient for parents with an immigrant background. Manuscript two explored first and second-generation immigrant parents' lived experiences of social stressors and facilitators of perinatal psychological well-being. Manuscript three examined the prevalence and course of depression, anxiety and stress from pregnancy to the postpartum

and associated antenatal psychosocial factors that may be particularly relevant for parents with an immigrant background.

A general discussion of the findings will follow, with a particular focus on important factors to examine in future research among immigrant parents, and perspectives on the development of policies to improve access to culturally appropriate perinatal mental health treatment and support in Canada.

Manuscript One

Parity and Psychosocial Risk Factors Increase the Risk of Depression During Pregnancy Among Recent Immigrant Women in Canada

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Publication citation:

Vaillancourt, M., Lane, V., Ditto, B., & Da Costa, D. (2022). Parity and psychosocial risk factors increase the risk of depression during pregnancy among recent immigrant women in Canada. Journal of Immigrant and Minority Health, 24(3), 570-579.

Abstract

Background: Prior investigations have examined risk factors associated to postpartum depression in immigrant women, but depression during pregnancy has received less attention. This study describes the prevalence and early determinants of antenatal depression among recent (≤5 years) and long-term immigrants (>5 years), compared to Canadian-born women.

Methods: 503 women completed standardized self-report questionnaires measuring sociodemographics and psychosocial factors. Multivariate logistic regressions identified first trimester risk factors for depression in each immigrant group.

Results: The prevalence of depressive symptoms was highest for recent immigrant (25.3-30.8%) compared to long-term immigrant (16.9%-19.2%) and Canadian-born women (11.7-13.8%). Among recent immigrants, multiparity, higher stress and pregnancy-specific anxiety in early pregnancy increased the risk of antenatal depression. Among long-term immigrants, stress in the first trimester was significantly associated with antenatal depressive symptoms.

Discussion: Knowledge of modifiable risk factors (pregnancy-specific anxiety and stress) may help improve antenatal screening and inform the development of tailored interventions to meet the mental health needs of immigrant women during the perinatal period.

Keywords: Antenatal Depression; Immigration; Perinatal mental health; Stress; Pregnancy-specific anxiety

Introduction

Background

In addition to regular parental demands, parents who have migrated experience various stressors, such as migratory stress, minority discrimination, language barriers and social isolation (Anderson et al., 2017; Jayaweera & Quigley, 2010; Tobin et al., 2018). Immigrant women's experience of psychological distress during pregnancy may be exacerbated because of their lower use of maternity-care services and mental health services due to various barriers, including their unfamiliarity with the health system, cultural beliefs or preferences, language barriers, lack of culturally tailored therapies, and the fear of being perceived as an unfit mother (Higginbottom et al., 2014; Higginbottom et al., 2015; Tobin et al., 2018).

A growing body of research has demonstrated that postpartum depression (PPD) is highly prevalent in women who have immigrated, with a prevalence of 20% reported in high-income countries (Anderson et al., 2017; Falah-Hassani et al., 2015), and of 6 to 37% reported in Canadian studies (Dennis et al., 2017; Dennis et al., 2016; Ganann et al., 2016; Mechakra-Tahiri et al., 2007; Stewart et al., 2008; Sword et al., 2006; Zelkowitz et al., 2008). In fact, studies have shown higher risks for both elevated antenatal and postnatal depressive symptoms associated with immigrant status compared to native-born counterparts (for meta-analysis, Falah-Hassani et al., 2015), which has similarly been reported in several Canadian studies (Alhasanat & Fry-McComish, 2015; Anderson et al., 2017; Dennis et al., 2017).

Although prior research has largely focused on postnatal mental health, a growing body of literature suggests that the prevalence of depression during pregnancy is comparably high or greater than PPD (Gavin et al., 2005; Underwood et al., 2016; World Health Organization & United Nations Population Fund, 2009). While antenatal depression has been shown to be one of

the strongest determinants of PPD (Robertson et al., 2004; Underwood et al., 2016; Underwood et al., 2017; Verreault et al., 2014), few studies have examined depression throughout pregnancy among immigrant women. A recent meta-analysis of sixteen studies, among immigrant women, reported a high prevalence (12%-45%) of clinically significant antenatal depressive symptoms (measured with self-report questionnaires) (Anderson et al., 2017).

While a growing number of studies have examined risk factors associated to PPD in immigrant women (Alhasanat & Fry-McComish, 2015; Dennis et al., 2017; Ganann et al., 2016), determinants of depression during pregnancy have received less attention. To date, risk factors that have been identified for antenatal depression in immigrant women have included younger age, shorter stay in host country, ethnicity (Black, Latin American, or Asian), poor social support, lower educational attainment, poor couple adjustment, obstetric problems, perceived stress, and stressful life events (Diaz et al., 2007; Miszkurka et al., 2010; Shin & Shin, 2015; Small et al., 2003; Truijens et al., 2017; Zelkowitz et al., 2004). Pregnancy-specific anxiety has not been examined as a risk factor for antenatal depression among immigrant populations, however some evidence in a non-immigrant sample suggests it may be a risk factor for PPD (Rwakarema et al., 2015), and general anxiety has been identified as a risk factor for antenatal depression among non-immigrant populations (Truijens et al., 2017; Underwood et al., 2017). Unplanned pregnancy, non-white ethnicity, lower educational attainment, lower income, food insecurity, perceived stress or stressful life events have also been reported as risk factors for antenatal depression in previous studies of non-immigrant women (Augusto et al., 2020; Bekele et al., 2017; Lancaster et al., 2010; Marcus et al., 2003; Richards et al., 2020; Rubertsson, WaldenstrÖm, et al., 2005; Rubertsson, Wickberg, et al., 2005; Truijens et al., 2017).

Given the growing size of the immigrant population in Canada and this group's vulnerability to psychological distress during the perinatal period which in turn may increase the risk of adverse maternal and infant outcomes, research into the risk factors associated with antenatal depression in this population warrants further study. While the findings to date suggest high prevalence rates for antenatal and postnatal depression among immigrant women, the course of antenatal depression throughout pregnancy and its risk factors have received relatively little attention in this population. Most studies have examined antenatal depression only in the third trimester of pregnancy (Underwood et al., 2017; Waldie et al., 2015). More prospective studies are needed to examine potential predictors of antenatal depressive symptoms as many previous investigations have been cross-sectional in design (for systematic review, Lancaster et al., 2010; Underwood et al., 2017; Waldie et al., 2015).

The current investigation sought to describe the prevalence and early determinants of depression during pregnancy among recent immigrant (≤5 years) and long-term immigrant women (>5 years), compared to Canadian-born women. Similar to what has previously been reported for maternal PPD, we expected that recent immigrant women would be at elevated risk of experiencing depression during pregnancy compared to Canadian-born women. Unplanned pregnancy, non-white ethnicity, lower educational attainment, lower income, and food insecurity were expected risk factors for antenatal depression, as they have been reported in previous studies. Based on prior evidence, we expected that perceived stress and pregnancy-specific anxiety in the first trimester would be associated with depressive symptoms during at least one trimester of pregnancy for both immigrant and Canadian-born women.

Methods

The current study is part of a larger investigation to better understand the role of psychosocial factors associated with gestational weight gain and postpartum weight retention.

Participants

Pregnant women were recruited by a research assistant from community and hospital-affiliated obstetrical clinics within 2 McGill University affiliated hospitals (McGill University Health Centre–MUHC and St. Mary's) (2014-2017). Women were eligible to participate if they a) were at least 18 years of age; b) were ≤ 12 weeks gestation; c) were able to communicate in French or English; and d) had access to the internet. Exclusion criteria included pre-existing medical conditions (i.e. type 1 or type 2 diabetes), gestational diabetes in a previous pregnancy, and multiple gestation (i.e. twins). These exclusion criteria were selected as these are factors known to influence gestational weight gain, which was part of the larger study. Eligible participants that indicated an interest in participating were given a secured website address to enter and provide informed consent and complete the standardized self-report questionnaires measuring sociodemographic and psychosocial variables in each trimester of pregnancy (weeks 13, 24, 36 of pregnancy). An e-mail prompt to the password secured website was sent to participants at each follow up with the battery of questionnaires (www.fluidsurveys.com). Ethics approval was granted by McGill Faculty of Medicine Institutional Review Board and the ethics review boards of the participating hospitals.

Measures

Socio-demographic information included age, ethnicity, education, marital status, income, work-status, parity, and food security.

Health information included medical history, current health, use of medications, date of last menstrual period.

The Edinburgh Postpartum Depression Scale (EPDS; Cox et al., 1987) is a widely used 10-item scale that assesses depressed mood in the past week. This scale was developed and validated for antenatal use (Cox et al., 1987; Murray & Cox, 1990). EPDS total scores range from 0-30, with higher scores indicating greater levels of depressive symptoms. A cut-off score of 12 or greater suggests a clinically significant level of depression and has been shown to have a sensitivity of 86 to 100% and a specificity of 78% to 94% (Cox et al., 1987; Murray & Cox, 1990; Murray & Carothers, 1990). The EPDS has been validated in diverse countries and ethnic groups (Adewuya et al., 2006; Carpiniello et al., 1997; Eberhard-Gran et al., 2001; Gibson et al., 2009; Hewitt et al., 2010; O'Connor et al., 2016).

Prenatal Distress Questionnaire Revised (PDQ-R; Lobel et al., 2008; Yali & Lobel, 1999) is a 17-item measure assessing stress specific to pregnancy (medical care, physical symptoms, parenting, bodily changes and infants' health). The PDQ-R has good psychometric properties and has been associated with poor health behaviours including smoking, unhealthy eating, and poorer physical activity, which are associated with poorer mental health (Lobel et al., 2008). The PDQ-R has been translated and validated across different cultural contexts (Caparros-Gonzalez et al., 2019; Esfandiari et al., 2020; Penengo et al., 2020; Yuksel et al., 2011).

Perceived Stress Scale (PSS; Cohen et al., 1983) is a 10-item scale assessing the extent to which situations are appraised as stressful within the past month. The PSS has been shown to have adequate psychometric properties and is positively correlated with several self-report and behavioral measures of stress in adults (Cohen & Williamson, 1988). The PSS has been translated into many languages and has demonstrated good psychometric properties in a wide

range of cultures (Andreou et al., 2011; Baik et al., 2019; Chaaya et al., 2010; Dao-Tran et al., 2017; Eskildsen et al., 2015; Huang et al., 2020; Jovanović & Gavrilov-Jerković, 2015; Klein et al., 2016; Lee et al., 2012; Lesage et al., 2012; Mimura & Griffiths, 2008; Nordin & Nordin, 2013; Örücü & Demir, 2009; Remor, 2006; Siqueira Reis et al., 2010; Wongpakaran & Wongpakaran, 2010).

Analysis

Chi-square analyses and one-way ANOVAs were performed to determine whether the groups differed with respect to participant characteristics (see Table 1).

EPDS scores were dichotomized into a binary variable, using the clinical cut-off score of 12 or more to determine those with elevated depressive symptoms in at least one trimester (refer to Measures section for information on cut-off). Chi-square analyses were performed on this dichotomous variable representing elevated depressive symptoms to examine group (recent immigrant, long-term immigrant, Canadian-born) differences at each time point.

Three multivariate logistic regressions were performed to identify first trimester risk factors for elevated depressive symptoms for each group (recent immigrant, long-term immigrant, Canadian-born). Direct entry of the following variables was used to predict elevated depressive symptoms during pregnancy: parity (“one child” or “two or more children”), food security (insecurity in the past 12 months defined as sometimes or often you and other household members did not have enough to eat because there wasn't enough money to buy food, sometimes or often you had enough to eat, but not always the kinds of food you wanted because you couldn't afford it), education (“high school and less” or “more than high school [e.g. specialized training school, CEGEP, university”), pregnancy intention (“trying to get pregnant?” yes or no), ethnicity (white or other [i.e. South Asian, South East Asian, West Asian, Chinese, Korean,

Japanese, Black, Filipino, Latin American, Arab, Inuit, Cree, Meti, Other]), income (0-40K, 41-80K, 81K or more), pregnancy-specific anxiety, and perceived stress. Statistical significance was set at 0.05. Data were analyzed using SPSS version 25 (IBM Corp, 2017).

Results

Participant Characteristics

At study entry, 751 women fully completed the baseline on-line questionnaires and 503 (65.9%) fully completed all three on-line assessments (n=91 recent immigrant; n=130 long-term immigrant, n=282 Canadian-born) (See Table 1 in Supplementary material for characteristics of participants missing and not missing data). No significant differences were found between participants with complete and incomplete data for parity, language spoken, marital status, education, working status, pregnancy intention, food security, pregnancy-specific anxiety, and elevated depression in at least one trimester. Participants with incomplete data were younger (32.5 (SD=4.45) vs 33.21 (SD=4.24), p=.035), more likely to be nonwhite (46.5% vs 63.4%, X^2=20.01, p<0.001), more likely to be in the lowest income level and less likely to be in the highest income level (25.0% vs 16.9%, X^2=7.12, p=0.008 and 45.8% vs 56.3%, X^2=7.57, p=0.006, respectively), less likely to have consulted a professional for emotional difficulties (20.5% vs 28.0%, X^2=5.08, p=0.024), and reported higher perceived stress (16.26 (SD=6.59) vs 15.24 (SD=5.96), p=.033) than participants with complete data. The following analyses were conducted using the subset of participants who completed all three assessments.

Table 1 shows participant characteristics of the final sample. Significantly more Canadian-born women (80.1%) were of white ethnicity compared to both recent (44.7%; X^2=44.04, p<0.001) and long-term (41.1%; X^2=63.10; p<0.001) immigrants. Significantly more Canadian-born women (80.1% vs 52.7%; X^2=26.48; p<0.001) and long-term immigrants (73.1%

vs 52.7%; X^2=9.69; p=0.002) reported being employed at baseline compared to recent immigrants. Recent immigrant women were significantly more likely to be in the lowest income level (<$40,000) than long-term immigrants (37.2% vs 16.5%; X^2=12.54; p<0.001) and Canadian-born women (38.5% vs 9.9%; X^2=39.90; p<0.001). Long-term immigrants were also significantly more likely to be in the lowest income level compared to Canadian-born women (16.9% vs 9.9%; X^2=4.08; p=0.043). Concerning the highest level of income (>$81,000), long-term immigrants (53.1% vs 30.8%; X^2 =10.82, p=0.001) and Canadian-born women (66.0% vs 30.8%; X^2=34.83, p<0.001) were significantly more likely to be in this group compared to recent immigrants. Canadian-born women were also significantly more likely to be in the higher income level than long-term immigrants (66.0% vs 53.1%; X^2=6.26, p=0.012). Significantly more recent immigrants (11% vs 4.3%; X^2=5.62; p=0.018) reported food insecurity at baseline compared to Canadian-born women. Canadian-born women (35.1%) were significantly more likely to have consulted a health professional for emotional difficulties compared to both recent (15.4%; X^2=12.67, p<0.001) and long-term (21.5%; X^2=7.68; p=0.006) immigrants. No significant group differences were found for age, parity, marital status, or education.

A one-way ANOVA showed a significant difference in scores for pregnancy-specific anxiety during the first trimester (F (2, 500)=4.17; p=0.016), with recent immigrant women reporting significantly more pregnancy-specific anxiety than Canadian-born women (p=0.013).

The prevalence of depressive symptoms defined as an EPDS score ≥ 12 was highest for recent immigrant (25.3-30.8%) compared long-term immigrant (16.9%-19.2%) and Canadian-born women (11.7-13.8%). Recent immigrant women reported significantly more clinical levels of depressive symptoms than Canadian-born women during the first (25.3% vs 12.8%; X^2=8.08; p=0.004), second (25.3% vs 11.7%; X^2=9.93; p=0.002), and third (30.8% vs 13.8%; X^2=13.40;

p<0.001) trimester. A significantly greater proportion of recent immigrant women reported elevated depressive symptoms during the third trimester compared to long term immigrants (30.8% vs 16.9%; X^2=5.86; p=0.015).

First trimester risk factors for elevated depressive symptoms for each immigrant group

Three logistic regression models were computed to identify first trimester risk factors for elevated antenatal depressive symptoms for each group. The results are presented in Table 2.

Among recent immigrants, the final model significantly predicted depressive symptom status, correctly identifying 79.1% of cases. Among recent immigrants, multiparity, higher pregnancy-specific anxiety and perceived stress in early pregnancy increased the risk of depressive symptoms during pregnancy (R^2=0.39 (Cox & Snell), χ^2(10)=44.51, p <.001). More specifically, a one-unit increase in PDQ-R and PSS total score in the first trimester of pregnancy was associated with a 19% (OR=1.19, 95% CI [1.06, 1.33] and 26% (OR=1.26, 95% CI [1,08, 1.47]) greater odds, respectively of clinical depressive symptoms.

Among long-term immigrants, the final model significantly predicted depressive symptom status, correctly identifying 84.6% of cases. Among long-term immigrant women, perceived stress in the first trimester was significantly associated with depressive symptoms during pregnancy (R^2=0.29 (Cox & Snell), χ^2(10)=43.72, p <.001). A one-unit increase in PSS total score in the first trimester of pregnancy was associated with 16% greater odds of clinical depressive symptoms (OR=1.16, 95% CI [1.06, 1.27]).

Among Canadian-born women, the final model significantly predicted depressive symptom status, correctly identifying 83% of cases. Among Canadian-born women, ethnicity (non-white), higher pregnancy-specific anxiety and perceived stress in the first trimester was significantly associated with depressive symptoms during pregnancy (R^2=0.30 (Cox & Snell),

$\chi^2(10) = 99.20$, $p < .001$). A one-unit increase in PDQ-R and PSS total score in the first trimester of pregnancy was associated with an 8% (OR=1.08, 95% CI [1.01, 1.17] and 29% (OR=1.29, 95% CI [1.19, 1.40]) greater odds of clinical depressive symptoms. Food insecurity, education, pregnancy intention and income were not significant independent predictors of depressive symptoms in any of the regression models.

Discussion

We sought to determine the prevalence and early determinants of depression during pregnancy among recent and long-term immigrant women, compared to Canadian-born women. The prevalence of depression was found to be particularly elevated throughout pregnancy among recent immigrant women compared to their Canadian-born counterparts. Our findings point to unique and common factors associated to depressive symptoms in immigrant and Canadian-born women.

As expected, recent immigrant women were more likely to report clinically elevated symptoms of depression during pregnancy compared to Canadian-born women throughout every trimester. The prevalence of depressive symptoms among our immigrant groups are similar to estimates that have previously been reported in studies examining antenatal depressive symptoms in this population with self-report measures (16.5-30.1% vs 12%-45% respectively (Anderson et al., 2017)). Furthermore, the greater prevalence of depressive symptoms during pregnancy among immigrant women compared to their Canadian counterparts has similarly been found in a Canadian study by Miszkurka et al. (2010). While we only found significant differences in the prevalence of depressive symptoms for recent immigrant women when comparing to Canadian-born women, Miszkurka et al. (2010) reported a higher prevalence of antenatal depressive symptoms regardless of time since immigration. However, in the latter study

women were assessed for depression only in mid-pregnancy, and with the Center for Epidemiologic Studies Depression Scale which has not been validated for use among pregnant women.

While certain sociodemographic factors previously identified as predictors of antenatal depression, such as lower income, lower educational attainment, unintended pregnancy, and food insecurity, were not related to antenatal depressive symptoms in our study, modifiable psychosocial risk factors including perceived stress and pregnancy-specific anxiety were significant predictors among all women despite migrant status. These results are similar to previous findings in studies of risk factors for antenatal depression in both immigrant and non-migrant populations (Shin & Shin, 2015; Small et al., 2003; Truijens et al., 2017; Zelkowitz et al., 2004). While general anxiety has previously been identified as a risk factor for antenatal depression in non-immigrant populations (Truijens et al., 2017; Underwood et al., 2017), our study is the first to our knowledge to examine pregnancy-specific anxiety as a risk factor for antenatal depression among immigrant women.

In another Canadian study, similar demographic factors (education and occupational status) were not related to depressive symptoms during pregnancy among immigrant women, while psychosocial risk factors (i.e. stressful life events, lack of social support and unsatisfactory marital relations) were found to be predictive of antenatal depression (Zelkowitz et al., 2004). Social support may be a key confounding factor that may explain the lack of association between demographic factors and depressive symptoms during pregnancy in our study. Poor social support (Milgrom et al., 2019; Saad, 2019) and disadvantaged socioeconomic position (Goyal et al., 2010; Lancaster et al., 2010; Emma Robertson et al., 2004) are both important determinants of perinatal mental health. Some evidence suggests that social support may be a protective factor

against maternal distress related to lower socioeconomic position and food insecurity during pregnancy (Nakamura et al., 2020; Quintanilha et al., 2016). Given the high levels of educational attainment and income reported in the women from our sample, it is possible that the participants had access to instrumental support that was not measured and accounted for.

The impact of pregnancy-specific anxiety and stress may be mediated by poor social support among immigrant women, particularly among women who have recently immigrated and have not had the time to rebuild an extensive social network. In women's country of origin, the support of family and friends during the perinatal period may be culturally expected and valued (Landale & Oropesa, 2001; Martinez-Schallmoser et al., 2005; Martinez-Schallmoser et al., 2003). While we did not have data on social support, other studies with immigrant women have identified poor social support as a risk factor for antenatal depression (Diaz et al., 2007; Shin & Shin, 2015; Small et al., 2003; Zelkowitz et al., 2004). A study by Zelkowitz et al. (2004), identified smaller social networks and lower satisfaction with social support among immigrant women with greater PPD. In our study, a significantly greater proportion of recent immigrant women reported elevated depressive symptoms during the third trimester compared to long term immigrants. Similarly, some studies have suggested a mediating effect of marital adjustment and social support on the relationship between stress or stressful life events and antenatal depressive symptoms among immigrant women (Coburn et al., 2016; Glazier et al., 2004; Zelkowitz et al., 2004). Future investigations should include measures of social support and couple adjustment in order to confirm the impact of these social factors on sociodemographic and psychological risk factors for antenatal depression.

Most of the women in the recent immigrant group reported many potential risk factors of distress including not working at baseline and lower income. This differentiates this group of

women to the long-term immigrant and Canadian-born women. While we controlled for income level and working status, it is possible that these factors had a cumulative effect as we do not know whether they also had these factors prior to their move to Canada.

Our study has several strengths, including the ethnic diversity in our sample of women. Another strength is the prospective design, which allows for examination of predictors of antenatal depressive symptoms over time during the pregnancy. While most studies have examined antenatal depression only in the third trimester of pregnancy (Underwood et al., 2017; Waldie et al., 2015), we included measures of distress throughout pregnancy. Importantly, this study expands our understanding of risk factors that place immigrant women at a higher risk for depressive symptoms during pregnancy. These findings highlight the importance considering modifiable psychological risk factors for the development of depressive symptoms such as perceived stress and pregnancy-specific anxiety.

Our study has limitations, including the use of convenience sampling, which may result in selection bias. Moreover, participants had generally greater educational attainment and higher income relative to the Canadian population. In particular, our Canadian-born group was comprised of primarily White and highly educated women. These factors limit the generalizability of results to all pregnant women in Canada. While approximately 16% of families in Canada are led by lone-mothers (Statistics Canada, 2014), this group of women are under-represented in this sample as only 6% reported being single or not cohabitating with a partner. Therefore, the results may not be generalizable to this population of women giving birth. Women who were not fluent in either English or French, which may include very recent immigrant women or women with low levels of acculturation (da Conceição & Figueiredo,

2015), were not represented in this sample. However, according to data from the 2016 Census of the Canadian population, the proportion of immigrants with knowledge of at least one of Canada's official languages is very high (93.2%) (Statistics Canada, 2017). Previous investigations have reported a higher prevalence of mental disorders and symptoms among immigrant women with low host country language ability during the perinatal period compared to immigrant women who do not lack this ability (Anderson et al., 2017; Chen et al., 2013; Zelkowitz & Tamara, 1995). The elimination of a language barrier as stressor in our study may have a protective effect and we could expect even greater rates of PPD among women with language barriers. Compared to participants with complete data, participants with missing data reported significant differences on certain variables that could be related with greater symptoms of depression (i.e. younger age, nonwhite ethnicity, lower income, higher perceived stress). However, the regression controlled for these variables within the model. Furthermore, symptoms of depression were measured by self-report questionnaires, rather than clinical interviews. However, the relevance of psychological distress symptoms to wellbeing for mothers and their infants has been shown in individuals meeting clinically significant cut-offs on self-report questionnaires (Cheng et al., 2006; Kingston et al., 2012; Staneva et al., 2015; Wisner et al., 2013). The use of self-report questionnaires for data collection may also limit the reliability of participant responses due to the social desirability biases implicated in self-report measures. A history of mental illness has previously been identified as a risk factor for antenatal depression in the general population (Freeman, 2019). We did not inquire about whether depressive symptoms were present prior to pregnancy, therefore we cannot determine whether symptoms may have been exacerbated or whether it was a new onset. However, we included participants history of consulting a health professional for emotional difficulties as a covariate. Other factors that may

influence mental health and help-seeking behaviours such as culturally based stigma towards mental illness, low social support, and poor marital adjustment were not assessed. However, since there have been few studies examining predictors of antenatal depression in immigrant women, this data provides an important basis for future studies.

Clinical implications and Conclusions

The high prevalence of depressive symptoms in pregnancy underline the need for a greater access to screening and follow-up of women's mental health during pregnancy. Enduring depressive symptoms may negatively impact both the relationship with the partner and infant. Given the growing size of the immigrant population in Canada and this group's vulnerability to greater psychological distress during pregnancy, greater attention to the modifiable risk factors associated with antenatal depression in this population is important. The implications of pregnancy-specific anxiety and stress as modifiable risk factors for the development of antenatal depression may help to improve antenatal screening and inform the development of tailored interventions to better meet the mental health needs of immigrant women during the perinatal period.

Some research in the US has demonstrated the efficacy of using culturally and linguistically tailored psychotherapy (e.g. IPT and CBT) (Le et al., 2011; Muñoz et al., 2007; Spinelli & Endicott, 2003), or a healthy lifestyle intervention (that is community-planned, and culturally and linguistically tailored) (Kieffer et al., 2013) to treat symptoms of antenatal depression in immigrant women. However, Canadian data has recognized the underutilization of mental health services in both perinatal and non-perinatal immigrants compared to Canadian-born populations due to their unfamiliarity with the health system, systemic discrimination, language barriers, financial barriers, lack of culturally tailored therapies, lack of awareness about

mental ill health, and cultural beliefs or preferences, such as significant stigma and shame towards mental illness (Ahmed et al., 2017; Higginbottom et al., 2014; Higginbottom et al., 2015; Kirmayer et al., 2007; Merry et al., 2011; Tiwari & Wang, 2008; Whitley et al., 2006). A recent study, using data from the Canadian Community Health Survey, reported a significantly lower likelihood for recent and long-term immigrants to consult a health professional for emotional difficulties compared to Canadian-born women (Nwoke et al., 2020). Psychological interventions can be delivered in the context of antenatal and maternity care by healthcare providers (Matvienko-Sikar et al., 2020), which may improve accessibility. Previous evidence has shown that the integration of mental health and primary care services have been successful in immigrant populations (Giacco et al., 2014). Collaborating with community services to provide psychoeducation on mental health that is acceptable to community members and tapping into religious organizations as a resource for social support could be valuable sectors of intervention among immigrants (Guruge et al., 2015). However, much research has suggested the need for the further development and delivery of mental health services in immigrant populations (Thomson et al., 2015).

The results of this study provide further evidence that women are at risk for antenatal depression, particularly recent immigrant women. Given that immigrant women are less likely to seek help for mental health issues due to various social barriers, there is a need to target women at risk by providing culturally tailored support resources and follow-ups during the perinatal period.

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Table 1. Participant characteristics (mean ± SD)

	Recent immigrant (N=91)	Long-term immigrant (N=130)	Canadian-born (N=282)	All participants (N=503)
Demographic variables				
Age (years)[a]	33.00 (3.68)	33.79 (4.33)	33.01 (4.36)[b]	33.21 (4.24)
Years of schooling	16.41 (2.38)	16.03 (2.79)[c]	15.81 (2.91)[d]	15.97 (2.79)[a]
Currently Working N (%)	48 (52.7%)	95 (73.1%)	226 (80.1%)	369 (73.4%)
Parity (Primiparous)	59 (64.8%)	69 (53.1%)	174 (61.7%)	302 (60.0%)
Planned Pregnancy N (%)	66 (72.5%)	101 (77.7%)	229 (81.2%)	396 (78.7%)
(yes)				
Ethnicity N (%)[e]				
White	40 (44.4%)	53 (41.1%)	226 (80.1%)	319 (63.8%)
Latin American	16 (17.8%)	16 (12.4%)	7 (2.5%)	39 (7.8%)
Arab	12 (13.3%)	15 (11.6%)	7 (2.5%)	34 (6.8%)
East Asian	11 (12.2%)	28 (21.8%)	19 (6.8%)	58 (11.6%)
Black	4 (4.4%)	4 (3.1%)	9 (3.2%)	17 (3.4%)
Other	7 (7.9%)	13 (10.0%)	13 (4.6%)	33 (6.6%)
First spoken language N (%)				
English	54 (59.3%)	91 (70.0%)	221 (78.4%)	366 (72.8%)
French	37 (40.7%)	39 (30.0%)	61 (21.6%)	137 (27.2%)
Marital Status N (%)				
Married/living with partner	87 (95.6%)	127 (97.7%)	264 (93.6%)	478 (95.0%)
Other[1]	4 (4.4%)	3 (2.3%)	18 (6.4%)	25 (5.0%)
Income				
< $40,000	35 (38.5%)	22 (16.9%)	28 (9.9%)	85 (16.9%)
41,000–$80,000	28 (30.8%)	39 (30.0%)	68 (24.1%)	135 (26.8%)
> $80,000	28 (30.8%)	69 (53.1%)	186 (66.0%)	283 (56.3%)
Food Insecurity N (%)	10 (11.0%)	7 (5.4%)	12 (4.3%)	29 (5.8%)
Psychological variables				
History of emotional difficulties	14 (15.4%)	28 (21.5%)	99 (35.1%)	141 (28.0%)
Depressive Symptoms (EPDS score ≥ 12)				
Trimester 1	23 (25.3%)	22 (16.9%)	36 (12.8%)	81 (16.1%)
Trimester 2	23 (25.3%)	25 (19.2%)	33 (11.7%)	81 (16.1%)
Trimester 3	28 (30.8%)	22 (16.9%)	39 (13.8%)	89 (17.7%)
PSS (M (SD))	16.38 (5.33)	15.50 (6.04)	14.76 (6.08)	15.24 (5.96)

PDQ-R (M (SD))	12.18 (5.99)	10.51 (5.98)	10.23 (5.35)	10.65 (5.67)

Note. EPDS= Edinburgh Postnatal Depression Scale; PSS= Perceived Stress Scale; PDQ-R=Prenatal Distress Questionnaire Revised [1]Single, Separated, divorced, widowed
[a]N=501, [b]N=280, [c]N=129, [d]N=281, [e]N=500

Table 2. Results of Logistic Regression Analyses Predicting Depressive Symptoms During Pregnancy (N=503).

	Recent Immigrants[a]			Long-term Immigrants[b]			Canadian-born[c]		
Variables	*b(SE)*	*OR*	*95% CI*	*b(SE)*	*OR*	*95% CI*	*b(SE)*	*OR*	*95% CI*
Multiparity (1 = Multiparous)	1.645 (0.69)	**5.18**	**[1.33, 20.17]**	-0.28 (0.48)	0.76	[0.30, 1.92]	0.67 (0.38)	1.96	[0.94, 4.11]
Food Security (1=some insecurity)	1.84 (1.16)	6.28	[0.64, 61.39]	-1.54 (1.09)	0.21	[0.03, 1.81]	-0.09 (0.82)	0.92	[0.18, 4.55]
Education	-1.00 (1.64)	0.37	[0.02, 9.13]	1.28 (1.23)	3.60	[0.32, 39.96]	-0.25 (0.58)	0.78	[0.25, 2.42]
Planned Pregnancy	0.73 (0.66)	2.07	[0.57, 7.47]	0.63 (0.54)	1.87	[0.65, 5.37]	0.35 (0.45)	1.42	[0.58, 3.46]
Ethnicity (1=Non-White)	-0.15 (0.60)	0.86	[0.27, 2.80]	0.65 (0.51)	1.91	[0.70, 5.20]	-0.94 (0.44)	**0.39**	**[0.17, 0.92]**
Income	0.08 (0.79)	1.09	[0.23, 5.09]	0.24 (0.70)	1.27	[0.32, 5.02]	-0.22 (0.62)	0.80	[0.24, 2.69]
History of emotional difficulties	0.38 (0.84)	1.45	[0.28, 7.48]	-0.71 (0.56)	0.49	[0.17,1.48]	-0.31 (0.37)	0.73	[0.36,1.51]
PSQ-R	0.18 (0.06)	**1.19**	**[1.06, 1.34]**	0.07 (0.04)	1.08	[0.99, 1.17]	0.08 (0.04)	**1.08**	**[1.01, 1.17]**
PSS	0.23 (0.08)	**1.26**	**[1.08, 1.47]**	0.15 (0.05)	**1.16**	**[1.06, 1.27]**	0.25 (0.04)	**1.29**	**[1.19, 1.40]**

Note. SE= Standard Error; OR=odds ratio; CI= confidence interval; PDQ-R=Prenatal Distress Questionnaire Revised; PSS=Perceived Stress Scale

Significant ($p < .05$) OR are bolded.

[a]R^2= 0.39 (Cox & Snell), 0.52 (Nagelkerke), Model $\chi^2(10) = 44.51$, $p < .001$.

[b]R^2= 0.29 (Cox & Snell), 0.39 (Nagelkerke), Model $\chi^2(10) = 43.72$, $p < .001$.

[c]R^2= 0.30 (Cox & Snell), 0.45 (Nagelkerke), Model $\chi^2(10) = 99.20$, $p < .001$.

Bridge to Manuscript Two

The goal of manuscript one was to determine the prevalence and early determinants of depression during pregnancy among recent and long-term immigrant women, compared to Canadian-born women. Findings from manuscript one showed that the prevalence of depression was found to be particularly elevated throughout pregnancy among recent immigrant women compared to their Canadian-born counterparts. This prospective study suggests that psychological risk factors such as perceived stress and pregnancy-specific anxiety contribute to depressive symptoms during pregnancy. While manuscript one expands our understanding of risk factors that place immigrant women at a higher risk for depressive symptoms during pregnancy, a limitation of this study was the lack of examination other potential risk factors for mental health that may be particularly salient for parents with an immigrant background. Limited studies have examined the perceived contributors of perinatal distress in immigrant parents, particularly men. Moreover, existing Canadian research on perinatal mental health has primarily compared first-generation immigrants to Canadian-born individuals from the dominant cultural group. To better understand the impact of migration on perinatal well-being, there is a need for studies that include diverse ethnic groups, as well as second-generation parents because they may share similar cultural influences with first-generation immigrant parents, but without the stressors associated with the immigration experience. Using a qualitative methodology could help to identify what psychosocial factors are most meaningful to underrepresented populations, which might differ from those traditionally studied in other populations. A qualitative approach was selected for manuscript two to obtain insights and a more profound understanding of well-being and its social contributors among immigrant parents, which may not be captured by quantitative measures. Manuscript two explored first and second-generation immigrant mothers

and fathers' lived experiences of social stressors and facilitators of perinatal psychological well-being.

Manuscript Two

A qualitative study exploring the perinatal experiences of social stress among first- and second-generation immigrant parents in Quebec, Canada

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Publication citation :

Vaillancourt, M., Deville-Stoetzel, J. B., deMontigny, F., Dubeau, D., Gervais, C., Meunier, S., ... & Da Costa, D. (2024). A qualitative study exploring the perinatal experiences of social stress among first-and second-generation immigrant parents in Quebec, Canada. BMC Pregnancy and Childbirth, 24(1), 1-15

Abstract

Background

Perinatal psychological distress adversely impacts the well-being and social adjustment of parents and their children. Expectant parents who have migrated may be at higher risk for perinatal psychological distress due to various migration-specific stressors and healthcare service barriers. Limited studies have examined the perceived determinants of perinatal distress in immigrant parents, particularly men. This study explored first and second-generation immigrant parents' lived experiences of social stressors and facilitators of perinatal psychological well-being.

Methods

Participants were recruited by convenience and purposive sampling as part of a larger study. Semi-structured interviews were conducted virtually with first and second-generation immigrant women and men in Quebec, Canada. An inductive thematic analysis was performed.

Results

Sixteen women (age = 34.8 ± 3.7 years) and ten men (age = 35.1 ± 4.9 years) from various ethnic backgrounds participated in the study at 7.4 ± 0.73 and 7.5 ± 0.72 months postpartum, respectively. Three themes were identified: (1) cultural pressures (cultural differences in parenting, gender-related cultural pressures, health and baby-related practices), (2) health and social service access (social benefits and resources, and systemic barriers in health care), and (3) discrimination (physical appearance or parental-related discrimination, gender-related discrimination, ethnic-related discrimination). First-generation immigrant parents reported greater acculturative stress (i.e. mental health stigma, health care access) and ethnic

discrimination concerns related to their distress. Among men, barriers include feeling as though the paternal role was devalued by society and not receiving consideration by health care.

Conclusions

Our results highlight different social factors of perinatal well-being perceived by men and women from various ethnic and immigration backgrounds during the perinatal period. Perceived factors include macro-level factors, such as a country's social climate, health and social policies and services, and social aspects of acculturative stress. Our findings suggest the need for continued efforts to challenge and eliminate discriminatory practices. Interventions and resources directed at first-generation immigrant parents should be bolstered. Understanding what parents perceive to facilitate or hinder their psychological well-being can help inform the development of tailored evidence-based programs and policies to better meet the mental health needs of Canadians and reduce gender disparities in the treatment of perinatal distress.

Keywords

Perinatal, Mental Health, Immigrant, Social Stress

Background

Becoming a parent is an exciting but also challenging life transition that is multidimensional as it involves significant psychological and social adjustment (McCourt, 2006). Migration status is being increasingly recognized as a social determinant of health (Rechel et al., 2013). Almost 25% Canadians are foreign-born and 17.6% are second generation immigrants (i.e. born in Canada with at least one foreign-born parent) (Statistics Canada, 2022). While many who immigrate to North America are of reproductive age, little is known about the impact of migratory stress on perinatal well-being in men and beyond perinatal depression in women.

While mental health has frequently been defined in terms of the absence of mental health disorders, it also encompasses broader dimensions of psychological well-being (i.e. psychological and behavioural adjustment, coping with demands and stressors, relative freedom of disabling symptoms of anxiety and depression, capacity to maintain relationships, and thriving in social roles) (American Psychological Association, 2018; World Health Organization, 2022). Expectant parents who have migrated may be at higher risk for perinatal psychological distress (i.e. symptoms of anxiety and depression, and stress exposure and perception) due to various migration-specific stressors and healthcare service barriers (Tobin et al., 2018). Migration can impact the health of immigrants as well as their offspring that are born and raised in the host country, as they negotiate a dual cultural background by combining their heritage values and practices with the values and social norms of the host country (Schenker et al., 2014).

Previous research examining determinants of perinatal mental health in the general population have reported several factors contributing to transition challenges, including unplanned pregnancy, obstetric complications, child-related difficulties (e.g. child care issues, health or behavioral difficulties), financial stress, and work-family conflict (Augusto et al., 2020;

Chhabra et al., 2020; Lancaster et al., 2010; Marcus et al., 2003; Philpott et al., 2019; Rubertsson et al., 2005; Truijens et al., 2017). In addition to the common stressors experienced by many expecting families, there are several potential contributors to perinatal psychological distress that are particularly relevant and distinct to first-generation immigrant parents, such as social support (Anderson et al., 2017; Harandi et al., 2017; Kiviruusu et al., 2020; Philpott et al., 2019; Razurel et al., 2013; Singley & Edwards, 2015; Tobin et al., 2018), gender role stress (Chhabra et al., 2020; Morse et al., 2000), acculturative stress (i.e. stress from challenges or conflicts due to the adjustment to a host society's culture) (Alhasanat & Giurgescu, 2017; Berry, 1997; Callister & Birkhead, 2002; Davila et al., 2009; Fortner et al., 2011; Gupta et al., 2013; Tobin et al., 2018), and discrimination (Ponting et al., 2020; Tobin et al., 2018; Walker et al., 2012). First-generation immigrant parent's experience of perinatal psychological distress may be exacerbated because of their lower use of maternity-care services and mental health services due to various barriers, including their unfamiliarity with the health system, cultural beliefs or preferences, language barriers, lack of culturally tailored therapies, culturally significant stigma and shame towards mental illness, and the fear of being perceived as an unfit parent (Higginbottom et al., 2014; Higginbottom et al., 2015; Merry et al., 2011; Tiwari & Wang, 2008; Tobin et al., 2018).

While the findings to date suggest high prevalence rates for antenatal and postnatal depression among first-generation immigrant women, more research examining its risk factors is needed. Previous Canadian studies examining perinatal mental health have primarily compared first-generation immigrants to samples of Canadian-born groups who belong to the dominant culture. There is a need for studies to increase our understanding of migration factors on perinatal well-being by including various ethnic groups, and second-generation parents because they may share similar heritage cultural influences with first-generation immigrant parents but

not the stress of immigration (Huynh et al., 2019). Moreover, little is known about the experiences of ethnic discrimination among first-generation immigrant men in Canada, as this has primarily been examined in women (Edge & Newbold, 2013). Fathers' well-being and involvement has a significant impact on better physical and psychological outcomes for their partners (e.g. postpartum depression, pregnancy and birth complications) and their child's well-being and development (e.g. child's attachment security, psychosocial adjustment, school performance) (Lamb, 2004; Plantin et al., 2011). However, research among immigrants during the perinatal period has been conducted almost exclusively among mothers, which has created a tremendous gap in knowledge for immigrant fathers' well-being (for systematic review, Mprah et al., 2023).

More qualitative studies are needed to examine potential factors influencing perinatal psychological distress in vulnerable populations to provide a more profound and rich account of parental experiences and insights that may not be captured by quantitative measures that have been primarily developed and tested among samples of individuals belonging to the dominant culture (Creswell & Creswell, 2017). Given the growing size of the immigrant population in Canada and this group's vulnerability to certain adverse mental health outcomes, research into the risk factors associated with perinatal psychological distress in this population is important and warrants further study. This is particularly important given that even mild to moderate psychological distress during the perinatal period has consistently been shown to adversely impact the physical well-being, psychological well-being and social adjustment of parents and their children (Cheng et al., 2006; Kingston et al., 2012; Lupien et al., 2009; Staneva et al., 2015; Wisner et al., 2013). Research with a greater focus on social determinants of perinatal well-being is key for preventative strategies aimed at improving antenatal screening and treatment.

This study was guided by the key tenets of the Ecosocial Theory which considers how social experiences and the multilevel exposure of the family (microsystem) within the community (exosystem) can directly impact individual mental health outcomes (Krieger, 2014). Moreover, the life course perspective recognizes that experiences, such as discrimination, remain relevant for health outcomes years later (Krieger, 1994, 2001a, 2001b). Rather than using a framework that justifies group differences in health outcomes, this approach permits to question the impact of social factors such as discrimination and social inequality on health (Peng, 2009).

The current investigation sought to explore first and second-generation immigrant parents' lived experiences of social stressors and facilitators of perinatal psychological well-being. Although certain factors such as social support, gender role stress, and discrimination may be relevant to both first and second-generation immigrant parents, we seek to explore if these factors, as well as acculturation, play a distinct role in the mental health of first-generation immigrant new parents. We expected to uncover potential insights into the ways in which support to first- and second-generation immigrant parents could be enhanced. The exploration of parents lived experiences and perceptions are invaluable to guide the ongoing development and improvement of perinatal programs and policies.

Methods

Study design

The current study is part of a larger research project investigating work-family conflict and parental leave on fathers' adjustment. Two hundred and forty-three heterosexual couples were recruited in their third trimester of pregnancy (28-36 weeks) primarily through social media (i.e. Instagram and Facebook advertising) due to the COVID-19 pandemic (December 2021-October 2022). Participants were eligible to participate if they a) were at least 18 years of age; b)

were cohabiting c) were able to communicate in French or English; d) had access to the internet, and e) father was employed (due to main objective of the larger study). Eligible participants that indicated an interest in participating were e-mailed a link to a secured on-line data capturing (Research Electronic Data Capture (REDCap)) system to provide informed consent for access and completion of the quantitative questionnaires and the qualitative interview. Through the REDCap system, participants completed the standardized self-report questionnaires measuring sociodemographic and psychosocial variables during the third trimester of pregnancy and at 2, 6 and 12 months postpartum.

A sub-group of individuals identifying as men or women with and without an immigrant background were selected for the qualitative interview after completing the questionnaire at six months postpartum. Men and women were contacted, and those that agreed selected a time for the interview. Interviewing was conducted until redundancy and saturation was achieved (i.e. no new information, themes, or explanations were being generated) (Pope & Mays, 2020). This allowed us to obtain a balance between rich experiential description from participants, and as much as possible, a representation of variety in experiences across the immigrant population in Quebec. We anticipated approximately seven parents per group (first-generation immigrant men, first-generation immigrant women, second-generation immigrant men, and second-generation immigrant women) to include a representation of parents from different ethnic backgrounds. This was possible for all groups except for second-generation immigrant men. This was part of a larger study and data collected among Canadian-born participants without an immigrant background were not examined in this study and have not yet been published.

Given the objective of the study to examine stressors and facilitators of perinatal psychological well-being among an ethnically diverse sample, purposeful sampling was used to

select 1) a majority of participants that reported elevated psychological distress during the third trimester or postpartum according to questionnaires (Depression Anxiety Stress Scale—21 (DASS-21 (Crawford & Henry, 2003)); score of ≥ 10 on the depression subscale and a score of ≥ 8 on the anxiety subscale) and 2) belonging to several ethnic groups, including men and women from dominant and non-dominant cultural groups or visible minority groups. Participants who identified with White/Caucasian/European ethnicity group or countries with major English ancestry (United States, Australia, or New Zealand) were considered the dominant culture. The Canadian and Quebec government defines visible minority status as "persons, other than Aboriginal peoples, who are non-Caucasian in race or non-white in colour" (Statistics Canada, 2021).

Data collection

Socio-demographic and health information were obtained with online standardized questionnaires. During the development of the semi-structured interview guide, a male and female colleague that were unfamiliar with the project examined the guide and flagged unclear questions. Two members of the research team with prior qualitative research experience, including first author "MV" (female PhD student in psychology) and coauthor "JB" (male research assistant with a PhD in sociology), were involved in the data collection process. We matched the interviewer's gender to the participant. This has been recommended, particularly for some traditional cultures where it is inappropriate for a male stranger to interview women (Schenker et al., 2019). Semi-structured individual interviews were conducted and recorded remotely via Zoom. Interviews involved posing open-ended questions and follow-up probes designed to obtain an understanding of participants' lived experiences (see Supplementary material 1 for question guide). The interviews began with general rapport-building and

contextual questions, such as asking about their experience as a parent. Then questions focused on the experiences, views, and feelings of the parents regarding mental distress during pregnancy and the postpartum. Field notes were made by the interviewer after every interview and were used to assist in the analysis of the transcribed audio recordings. All recordings were transcribed verbatim and were double-checked against the recordings to ensure accuracy. The transcripts were anonymised and entered into Dedoose qualitative software programme (www.dedoose.com) to facilitate data management.

Thematic analysis

As we aimed to explore insights into parents lived experiences and perceptions, data were analysed using an inductive thematic analysis approach following the guidelines stipulated by Braun and Clarke, which includes data familiarisation, generating initial codes, generating initial themes, developing and reviewing themes, defining and naming themes and writing up (Braun & Clarke, 2021). This method allows for the use of a constructionist epistemology (i.e. meaning and experience are deemed to be socially produced). Therefore, the analysis did not focus on individual psychologies, rather it sought to theorize the sociocultural contexts and structural conditions related to psychological distress.

Two members of the research team (MV and JB) were involved in the data analysis process to allow for triangulation. All transcripts were independently read through several times by MV to familiarize herself with the data and obtain a sense of the entirety of the data. Both MV and JB coded all transcripts. Firstly, a subgroup of transcripts from mother and father interviews were coded by identifying keywords to generate initial codes (MV and JB). This process was repeated for each transcript with previous transcripts reconsidered iteratively as codes and themes emerged with the analysis of subsequent transcripts. Next, the codes were

discussed between MV and JB to arrive at a consensus regarding the initial codes and a codebook was agreed upon. All the transcripts were individually reread, and codes were updated, and the remaining transcripts were coded (MV and JB). MV categorized codes into themes and subthemes. Next, MV and JB met to discuss themes. Throughout this process, themes and subthemes were compared, modified, combined, and developed in line with new and alternative data. To ensure credibility of results, we took the themes back to the original transcripts to verify that they made sense within the actual data (i.e. the coded extracts and the entire data set). The final step involved a meeting with the first author and the senior/corresponding author to discuss emerging ideas, themes, and subthemes and to decide on the final themes that best represent the collective thoughts and experiences of the participants regarding the social factors influencing perinatal distress (MV, DD). Interpretations were negotiated among all authors.

All study materials, including the protocol and interview questions were approved by the research ethics board of the McGill University Health Centre.

Results

Semi-structured interviews were conducted among first-generation immigrant and second-generation women (N=16, age=34.8±3.7 years, 7.4±0.73 months postpartum) and men (N=10, age=35.1±4.9 years, 7.5±0.72 months postpartum) in Quebec, Canada, and lasted approximately 45 minutes (see Table 1).

Thematic analysis

The thematic analysis of social (macro-level) stressors and facilitators resulted in the identification of the following three main themes (see supplementary material for Table S1 containing quotes):

1. Theme 1— Cultural pressures with three sub-themes: cultural differences in parenting, gender-related cultural pressures, health and baby-related practices
2. Theme 2— Health and social service access with two sub-themes: social benefits and resources, and systemic barriers in health care

- Theme 3— Discrimination with three sub-themes: physical appearance or parental-related discrimination, gender-related discrimination, ethnic-related discrimination

Table 2 contains a summary of the subthemes reported by group.

1. Cultural pressures

1.a.i. Cultural differences in parenting

First-generation immigrant men and women and second-generation immigrant women described clashes of cultural differences between the Canadian and heritage cultures concerning parenting approaches that affected their psychological well-being during the perinatal period. Women reported these clashes occurring with family, while men reported these challenges to occur at work.

First- and second-generation immigrant women identified Canadian culture as a facilitator of a more favorable parenting style. For example, a first- and second-generation immigrant woman explained that in Quebec parenting is less focused on the hierarchy between the child and the parent, while their heritage culture promotes authoritarian parenting, to which they are opposed.

On the other hand, first-generation immigrant men and women and second-generation immigrant women identified their heritage cultures to be more family-oriented in comparison to non-immigrant Canadian families, which facilitated their psychological well-being during the perinatal period. A second-generation immigrant mother noted greater expectations for family

engagement (i.e. her parents and siblings) with her family compared to Canadian mothers that do not have immigrant parents. "*I'll be frank in saying, I'm happy to be in a Middle Eastern family where like, people invite themselves over and my parents take care of my kids like they're their own and like, take them, and my brothers will do the same. And that was really helpful post birth. And it was really helpful for my son to transition to having a sister because he felt super valued and like, he didn't feel you know, replaced at all, he was still in the big family*."

However, first-generation women, as well as both second-generation immigrant men and women reported feeling pressured to follow in heritage culture traditions for parenting, which contributed to distress in some. For example, a first-generation immigrant mother described how she was criticized and did not feel supported by her family in her choice to teach her infant one of Canada's official languages, instead of exclusively focusing on their native language. Second-generation parents similarly experienced distress due to a discordance between their chosen parenting practices and those advocated by their parents or in-laws. A second-generation immigrant woman expressed how she felt after her mother was upset at decisions that she made regarding a cultural event that was for her baby; "*I get down, I get sad, and sometimes just start crying. […] So, there's moments where I take it bad. I tend to come out of it pretty fast, but it'll hit me for few hours, and I'm just in a mood. It's not a constant thing. Like it's just whenever my mom happens to share something that's happening on her side, and it has something to do with my daughter. Like every time I have an event for my daughter it's like a big story in my family*".

First-generation immigrant women identified the respect of personal boundaries as another facilitator of Canadian culture, and conversely, the disregard of these boundaries as a barrier due to their heritage culture. For example, participants from countries like Brazil and China explained how others within their heritage culture are intrusive and give unsolicited

parenting opinions and advice, while Canadian culture is more cautious in doing so, which allows them to "*lead their motherhood*".

1.a.ii. Gender-related cultural pressures

First and second-generation immigrant men and women reported heritage culture influences on gender role division of labour and parental leave expectations as barriers to their well-being. A first-generation immigrant mother from China described how her heritage culture influenced her to feel anxious when her partner took paternity leave to be more involved. She found herself questioning whether he felt he had to take the leave because she was not supporting him enough and diminishing his ability for professional development. A second-generation immigrant father described the pressure from his family to take a shorter paternity leave because of his gender; *"My mother is of Latin origin, so for her, the father must do nothing. He must go to work and then the mother stays home with the baby, so she doesn't really understand why I took such a long paternity leave. She wanted me to get back to work as soon as possible*". However, this participant felt supported to take a longer paternity leave by Canadian society given the additional weeks of parental leave provided when a father takes the full amount of paternity leave available. A facilitator of Canadian culture described by a second-generation immigrant woman included a more equitable division of labor by gender. This participant explained: "*I think it had an impact* [on perinatal mental well-being] *because during my pregnancy I was not feeling well, so maybe my husband felt more comfortable doing more house-related tasks* [*cleaning, cooking, groceries*]*"*. She attributed her partner's comfort to take up traditionally female tasks to Canadian family gender roles; "*in Canadian culture it's more accepted that a man does it"*.

Negative systemic expectations of mothers in Canadian culture were signaled by first and second-generation immigrant men and women. Women reported a greater difficulty balancing new maternal expectations in addition to everyday demands (i.e. being independent while keeping up a façade that all is well, the negative impact of maternity on their careers, and difficulty asking for help). A second-generation immigrant mother described how Canadian mothers are expected to retain all the past aspects of themselves (e.g., intellectual, sexual, and physically active selves) and concurrently develop a maternal self. To make these demands possible, women are recommended to make the time to engage in self-care activities. Thus, society imposes an "*additional pressure on mothers to like, do this one more thing that they just don't have the energy to do*". First and second-generation immigrant fathers also echoed these systemic expectations on women to go above and beyond in parental-related tasks; *"I feel like for men, just by being there, and by taking a little longer parental leave, and by trying to be involved, society feels like we're already doing a lot. And we don't have a hard time valuing that, while for women it's the opposite. It's like they always have to be perfect in everything, and then they should do like in advertisements: use washable diapers, do positive education, do child-led dietary diversification, do breastfeeding and everything. In the end, it is extremely difficult to do all of this. So, they have a kind of pressure that is immense*" (second-generation immigrant father).

1.a.iii. Health and baby-related practices

First-generation immigrant parents expressed how Canadian health, e.g., mental health support, and baby-related, e.g., allowing the baby to be by the parents' side after birth, practices positively affected their mental well-being. The openness to speak about mental health and receiving care was identified as positive within the Canadian culture compared to the heritage

cultures of some of the first and second-generation immigrant women. An immigrant mother captured this lived reality: *"I guess maybe it was my cultural heritage that maybe stopped me from going to get those help because you don't have that usually and so the pregnancy was harder the postpartum was harder, the breastfeeding was harder, whereas this time around, I'm like, whatever help is available and it's free, I'm taking it. And it just made my journey easier. And that's, I think it's a plus from the Canadian culture there*." Similarly, a first-generation immigrant father reported how his family discouraged him from sharing about perinatal difficulties because they attach stigma towards any negativity during this period. The perception of parenthood as "a blessing" creates a pressure on parents leading to exacerbation of mental health difficulties.

However, imposing Canadian pregnancy- or baby-related practices was a barrier for well-being among some first-generation immigrant parents. For example, a first-generation immigrant father explained how they were not able to follow a cultural tradition after birth because of Canadian health guidelines. Despite understanding, the parents felt it was odd as it is common practice in their country of origin. Moreover, a first-generation immigrant woman from Senegal attributed the constant physical tests, e.g., blood tests, during maternity care to Canadian culture and claimed it contributed to perinatal distress.

2. <u>Health and social service access</u>

2.a.i. Social benefits and resources

First-generation immigrant men and women reported that access to good social benefits promoted positive psychological well-being during the perinatal period. First-generation immigrant fathers explained how "*the approach of Quebec's society"* and the governmental practical support was the most beneficial facilitator of parental perinatal well-being. For

example, a first-generation immigrant father expressed: "*I feel support in a way because you don't have to pay for the appointments. You can have a good doctor without paying them.[…] And then you have like the child benefit*". Similarly, a first-generation immigrant woman felt fortunate to give birth in Canada given the more supportive parental leave policies (i.e. longer maternity leave). This participant explains that she chose not to include her heritage culture within her maternity practices because she believes it does not promote women's rights to fully experience their motherhood (e.g. women must make the difficult decision to stop breastfeeding after three months to go back to work given their maternity leave policies). Moreover, a greater access to online and in-person resources (e.g. prenatal classes, lactation consultant, etc.) in Quebec was identified as a facilitator of well-being among first and second-generation immigrant women.

2.a.ii. Systemic barriers in health care

First-generation immigrant men and women identified systemic barriers in navigating the health care system given the difficulty in obtaining access in Quebec. "*So, you need to beg for everything, right? You need to know everyone in order to get the service that you need, right? So, and then for an immigrant it's even harder, right? Because you don't have a tie here, you do not have history*" (first-generation immigrant father). Since many immigrants' families were not able to visit because of the pandemic, some sought professional support and perinatal services to substitute the family's support. However, access to perinatal services was limited during the pandemic. A first-generation immigrant mother explained how she had prepared to have a doula that speaks her first language as well as French to have someone to support and advocate for her in case of an emergency during childbirth; "*I was afraid that I wouldn't be able to a certain point to speak any other language other than my mother tongue. Just because of, for example, if I had*

to take any medications, strong medication". However, due to COVID-19 restrictions she was not able to have her doula with her in person during delivery, which exacerbated her distress.

3. Discrimination

3.a.i. Physical appearance or parental-related discrimination

Both first- and second-generation women reported encountering judgments and negative assumptions related to their physical appearance and/or their maternity, and for some, these encounters increased their levels of distress. Some women noticed others giving them strange looks in public and speculating about their physical situation (e.g. whether they were overweight or pregnant, or their age). Some women expressed social difficulties at work due to their pregnancy. A first-generation immigrant mother explained that her superior at her employment posed harmful assumptions about her competency, posed acts of harassment, and tried to fire her without cause, which caused stress and made it difficult to complete routine tasks without scrutiny. She noticed that this harassment began when she did not want to reveal her family planning to her superior and got worse during her pregnancy.

First and second-generation immigrant women reported maternity-related discrimination in the form of dismissive encounters with health care professionals during maternity care. Participants reported that these encounters contributed to self-doubt, stress, and anxiety. An immigrant mother describes it well: "*I was really doubting a lot of what I was seeing in the child and it [comments from health care professionals] contributed to that. Even if there is such a little thing, I will start to stress out. (…) It was really to the point where I would say it attacked all my sensations...not my feelings of my...my perception of how I saw myself as a person, how I function, to be able to rely on my knowledge and on my judgment*." Conversely, a 36-year-old second-generation immigrant mother described receiving constant concerns from health care

providers regarding her pregnancy due to her age and weight. Constantly feeling judged by health care providers based on physical features was a source of stress for this participant.

Male participants also reported experiences of parental discrimination based on their physical appearance. A second-generation immigrant father explains how generally he does not notice negative expressions from people in public when he is walking with the stroller, however, *"it seems that the more affluent neighborhoods I go to, the more I will get a "secondary look". And I'm not sure if that's because of being a father in the situation or if that's because of, yeah, being somebody who's heavily tattooed and the way that I generally dress seems to look a little bit more aggressive to some people. So, that may be a barrier* [to perinatal mental well-being] *as well".*

3.a.ii. Gender-related discrimination

A common sentiment expressed among first and second-generation immigrant men was that their paternal role was devalued by society. Participants highlighted not enough gender equality in father's rights and parenting issues in Quebec. A first-generation immigrant man described feeling as though from one day to the next the significance of the parental role was exclusively for the mother, and that fathers have difficulty establishing their role within the family and society. This participant pointed out that the inequality between mothers and fathers in Quebec is reflected in the scarce number of resources available for fathers compared to mothers. Similarly, other participants expressed not receiving support as fathers during maternity care. A first-generation immigrant father described his experience during prenatal courses: "*I found that there was five hours on motherhood and one slide about fathers concerning what they can do to help the mother*". A second-generation father described how any requests from the father during childbirth were dismissed by the medical staff, whether it was as mundane as

emptying the trash in their room, or important, such as, advocating on behalf of his partner that asked him to communicate on her behalf. "*The mom let me know when the nursing staff were not there that she had reached a point where she was no longer capable. However, when I transmitted the message to the nurses, because it was me and not the mom…but the mom was unable to say it, it wasn't taken into account, so it was things like that, that gave me the impression that because I'm a dad and not a mom, we don't take it into account".*

A first-generation immigrant father explained how his partner emphasizes that the mother is the most important parent for their child and devalues his paternal role within the family. This participant attributes his partner's attitude towards fatherhood to maternity pages she frequently engages with on social media. These comments were difficult to experience because it created a hierarchy between them regarding their child. Lastly, a first-generation immigrant father explained how he experienced discrimination by work colleagues regarding his choice of paternity leave duration, as they deemed it to be too long, despite it following the governments regulations of permitted parental leave; *"the only bit of discrimination I felt was when they knew: "he's now taking two and a half months off, he's taking eight weeks plus five weeks". That got people talking; "how come the father is taking that many weeks off*?*". It was a little more than two, three people, who criticized me. And I said it did not affect me. But it was difficult*".

3.a.iii. Ethnic discrimination

First-generation immigrant participants experienced ethnic discrimination in society and during health care, which influenced their access to and quality of services and contributed to stress. After delivery, a first-generation immigrant mother noticed that the medical staff would check up on a Caucasian mother in the same room yet neglected to check on her and forgot to give her a transfusion after she had experienced a difficult labor. "*They just kind of forgot about*

me after I gave birth. Like, I just, and I felt it was, I don't like the word racial, but like ethnic. Like, anyways, because like the lady next to me, she was Russian and they were in there, like, ever so often. Yeah. So, I felt very neglected during that time". A first-generation immigrant father suspected that his partner's severe pain during labour was dismissed by health care professionals because she is not Caucasian. This participant described how health care professionals in Quebec may perceive individuals from Latin America or Africa to have a higher threshold of pain, so they consider their comments about pain as an exaggeration and dismiss them. "*So, they're like, "okay, no, they're just exaggerating, they're just exaggerating. They're, not that, that bad. They can withstand more, let's give attention to other people and she can come afterwards". I have no proof to say that was the case, but it did end up feeling like that".*

An immigrant father described an upsetting encounter with colleagues after his baby was born. He felt uncomfortable after the birth because his colleagues "*would refer to her (his baby) as a brown baby. And, for me, it was just a baby. For them to like say a brown baby was like okay...And it is just one of those moments that makes you really realize, "oh yeah, these people are basically different than me*".

Discussion

Our study explored first- and second-generation immigrant parents' lived experiences of social stressors and facilitators of perinatal psychological well-being. Although immigrants are a heterogenous group with varying experiences, our findings highlight the perceived impact of macro-level factors, such as a country's social climate, health and social policies and services, and social aspects of acculturative stress on the perinatal well-being of first and second-generation immigrant parents. First-generation immigrant parents reported greater adaptation

stressors (i.e. mental health stigma, health care access), and ethnic discrimination concerns related to their distress.

Participants experienced cultural pressures in a multitude of contexts concerning parenting decisions during the perinatal period, a distinct form of social stress with potentially significant implications for the parents and their offspring. First and second-generation immigrant parents reported greater family-oriented values in their heritage culture as a strength given increased familial support. However, participants felt pressured to follow heritage cultural traditions concerning parenting practices, which contributed to distress in some. Similarly, first- and second-generation immigrant women in North America experienced postnatal stress due to conflict with their parents or in-laws regarding a discordance between their chosen parenting practices and heritage cultural practices recommended to them (Li et al., 2021; Mamisachvili et al., 2013). A recent Swedish study found first-generation immigrant women reported parenting challenges related to balancing the Swedish system and their heritage cultural practices (Johansson et al., 2023). We found that second-generation immigrants may experience certain perinatal stressors including navigating host and heritage cultural practices and demands, which has been found in previous research outside of the perinatal period (Hendriks & Bartram, 2016; Padilla, 2006). Some cultures place a strong value on familial relationships, and therefore obtaining familial approval and social support (Corona et al., 2024; Li et al., 2021). Future research should go beyond examining social support and examine whether there are some moderating variables (e.g. identification with heritage culture) that could explain when heritage culture can reduce or increase the risk of perinatal mental health distress. More specifically, in our study, women reported cultural clashes and pressures occurring primarily with family, while men reported these challenges to occur at work. Similarly, a qualitative study found that while

both men and women reported feelings of inadequacy during the perinatal period, men's feelings were expressed as stress related to work expectations, while women's were expressed as depressive symptoms related to parenthood expectations (Johansson et al., 2020).

Culture can prescribe acceptable norms for parental behaviors associated with gender role and are another cause for intergenerational conflict within the family (Bond, 2020; Urindwanayo, 2018). First and second-generation immigrant parents reported Canadian expectations for mothers, and heritage culture influences on gender role division of labour and parental leave expectations as barriers to their well-being. Immigrant women experience a greater burden of family and household responsibilities due to heritage cultural norms (Johansson et al., 2023). According to first-generation immigrant mothers in our study and another Canadian study (O'Mahony & Donnelly, 2013), immigrant fathers have chosen to maintain traditional gender roles (i.e. less engagement in emotional and family-related practical support) despite the increasing shift towards greater father engagement in the host culture (Yogman & Eppel, 2022). These expectations negatively impacted women's psychological well-being due to feelings of loneliness in the host country and the lack of social support women would normally obtain by extended family in their country of origin (Johansson et al., 2023; O'Mahony & Donnelly, 2013), which are both risk factors for perinatal depression. While we did not find gender-role conflict among first-generation immigrant fathers in this study, other research has found that changes in gender roles for fathers after immigration can cause symptoms of stress and depression due to experiences of changing family roles, limited work opportunities, and discrimination (Bond, 2020; Mprah et al., 2023). Conversely, second-generation parents reported greater gender role division of household labour and accompanying psychological well-being benefits, which could be explained by greater exposure to host culture.

First-generation immigrant parents explained how Canadian health and baby-related practices positively affected their mental well-being, notably regarding mental health care. While we found that first-generation immigrant parents reported cultural context for mental health stigma, this was not found among second-generation parents as they reported being positively influenced by the host country's openness towards mental health. In a Canadian study, first and second-generation women described how their parents and in-laws did not understand the concept of postnatal mental health problems, and consequently were unsupportive when participants communicated their concerns (Mamisachvili et al., 2013). In the latter study, first- and second-generation immigrant mothers found stigma to be experienced similarly regardless of their immigration status (Mamisachvili et al., 2013). However, this difference in findings compared to our study may be due to their purposeful selection of second-generation Canadians who self-identified as having a strong connection to their home culture. The literature among immigrant mothers' perinatal mental health suggests that mental health stigma may be embedded within cultural identity, thus women conceal their distress because they experience shame and fear the stigma attached to mental illness within their family and ethnic community (Kassam, 2019; Li et al., 2021; O'Mahony & Donnelly, 2013; Urindwanayo, 2018). Another perinatal study reported that first-generation immigrant women expressed a mistrust of social services, which may have affected their psychological well-being and their willingness to seek support, however trust was found to increase with the time spent in host country (Johansson et al., 2023). The participants in our study have been in Canada for a longer amount of time, which may explain why they did not report mistrust. For more recent immigrants, it may be important for immigrant-specific resources to include information on social services.

Evidence suggests that immigrants report higher levels of happiness when there is a qualitatively good government, e.g., policies and services that create a healthy and safe environment (Hendriks & Bartram, 2016). Although first-generation immigrant men and women expressed that access to supportive health and social benefits and resources promoted positive psychological well-being during the perinatal period, participants identified systemic barriers in accessing and navigating the health care system. Our results mirror findings from other studies among immigrants highlighting the additional challenges in accessing health care generally (Tsai & Ghahari, 2023) and during the perinatal period (Johansson et al., 2023) given their unfamiliarity to the health care system, and further emphasizes the importance of having a social network that may provide helpful health system information or health care provider contacts. Similar to our findings, first-generation immigrant mothers in Sweden expressed that obtaining health care was significantly easier once they knew more about the Swedish system (Johansson et al., 2023). Moreover, our findings recognized how marginalized communities have been disproportionately impacted by COVID-19 policy responses. During the COVID-19 pandemic, changes occurred both socially and in maternity care, which have been found to be associated with poor mental health symptoms, e.g., posttraumatic stress, anxiety, depression and loneliness, in the general population (Basu et al., 2021; McKinlay et al., 2022). Second-generation immigrants have a greater knowledge of the host culture and may have more resources and social capital. During perinatal period, many cultural customs and expectations rely on the support from extended family (Urindwanayo, 2018), which was particularly challenging considering travel restrictions during the pandemic. While interventions and resources directed at parents should be bolstered during periods of crisis, such as a pandemic, it may be particularly important

among first-generation immigrant parents who may experience greater difficulties navigating the healthcare system both practically and given cultural differences.

The perception of discrimination in everyday contexts were reported to impact parents psychological well-being, mirroring findings of other studies in the general population (Carter et al., 2017; Lewis et al., 2015), among male and female first-generation immigrants (Escamilla & Saasa, 2020; Lewis et al., 2015; Saasa et al., 2022; Schmitt, 2014), and among women during the perinatal period (Doherty et al., 2023; Mehra et al., 2020; Segre et al., 2021; Surkan et al., 2006). A meta-analysis (Schmitt, 2014) found this relationship to be present across a wide range of well-being measures and for both personal and group discrimination. High levels of discrimination have also been reported among second generation immigrants (De Vroome et al., 2014; Reitz & Banerjee, 2007), and have a negative effect on life satisfaction levels (Safi, 2009). Discrimination over the life course may contribute to the deterioration of mental health for first and second-generation immigrant parents. Research suggests that heightened stress responses and negative coping behaviours (e.g. substance use or detachment coping) mediate the relationship between discrimination and physical and mental health (Ayala, 2019; Pascoe & Smart Richman, 2009; Sandberg et al., 2023). Some researchers have found differences in discrimination sensitivity among first- and second-generation immigrants related to cultural-based variations (e.g. having one native parent, majority language at home, religious affiliations, collectivist vs individualistic cultures), ultimately impacting the level of emotional distress (André & Dronkers, 2017; Garris et al., 2011). More research is needed to examine the mechanisms and buffers through which environmental stressors like discrimination impacts immigrants' mental health, such as cultural differences.

Some forms of discrimination encountered by our participants add to other specific stressors faced by immigrants. Male and female participants reported encountering judgments and negative assumptions related to their physical appearance (e.g. weight) and/or their maternity (e.g. parental or pregnancy discrimination at work), and for some, these encounters increased their levels of distress. Other studies have found that women report pregnancy-related discrimination at work (Adams et al., 2016; Fox & Quinn, 2015), and communication problems (Attanasio & Kozhimannil, 2015) and weight-related stigma/discrimination during prenatal care (Bombak et al., 2016). Despite policies in place to support the well-being of parents in Canada, the USA, and the UK, women continue to report pregnancy discrimination at the workplace (employment termination or demotion upon their employers learning of their pregnancy or when returning to work after maternity leave, negative stereotyping, and negative or rude interpersonal treatment because of pregnancy) (Adams et al., 2016; Fox & Quinn, 2015; The Chartered Institute of Personnel and Development, 2016; United States Equal Employment Opportunity Commission, 2018). A Canadian report in 2021 found that a third of employees that had taken maternity leave experienced pregnancy discrimination (Moms at Work, 2021). Perceived pregnancy discrimination has been found to indirectly lead to adverse health outcomes for mothers (postpartum depressive symptoms) and their babies (increased medical appointments, lower birth weights and gestational ages) via the mechanism of maternal perceived stress (Hackney, 2021). It is possible that immigrant parents may not be aware of the legislation that prohibits workplace discrimination related to pregnancy, therefore, parents should be provided with this information and relevant resources. Providing training to managers that is family-supportive could help improve employee job satisfaction and better health among parents

(Hammer et al., 2011). However, more research is needed to understand discrimination and paternal mental health.

Among men, barriers to perinatal mental health included society undervaluing the paternal role, not receiving consideration or support during maternity care, and first-generation immigrant men reported gender inequality in parenting issues. These identified subthemes resonate with findings from previous studies on fathers' prenatal experiences that reported men feeling excluded during the labour of their partners and that information and support from healthcare providers had a positive influence on paternal well-being (for systematic review, Mprah et al., 2023). While the importance of father involvement during the perinatal period has been determined, men's role within the family continues to be undervalued and they are underrepresented in perinatal research, interventions or parenting programs, particularly among minority men (Bond, 2020). It has been found that men are reluctant to seek mental health treatment due to gendered stigma, with first-generation immigrant men less likely to access mental health or social services compared to their non-immigrant counterparts (Bond, 2020). Therefore, first-generation immigrant men may experience structural and cultural barriers in accessing services. Research that disregards men's emotional experiences related to migration and their expressions of psychological distress reinforces the socially constructed misconception that men are invulnerable. This leads to gender disparities in the screening and treatment of distress during important transitional periods such as parenthood. The development of interventions and programs that are culturally safe by including men's coping styles and the particular needs of immigrant fathers are needed (Bond, 2020).

Intersecting with these social forces, ethnic and racial discrimination need to be considered because immigrants are discriminated against by both the dominant racial group and

other minorities that are better situated (Schenker et al., 2014). Ethnic discrimination was reported as an important source of stress and a barrier for health care among first-generation immigrant participants in our study. More than half of first-generation immigrants in Canada have reported experiences of discrimination during health care (Pollock et al., 2012), and the longer immigrants live in Canada, the more likely they are to experience racially based discrimination, harming their mental health (Beiser, 2005; Schmitt, 2014). In North America, women from different minority ethnic backgrounds have reported experiences of ethnic or racial discrimination (e.g. harmful racist assumptions and discriminatory treatment) during maternity care (Attanasio & Kozhimannil, 2015; Boakye et al., 2023; Mehra et al., 2020; Mohamoud, 2024), which can lead to unsatisfactory health care interactions, a decreased access to quality care (Mehra et al., 2020; Mohamoud, 2024) and poorer perinatal psychological health (Mehra et al., 2020; Segre et al., 2021). Our study supports the importance of putting practices in place to assess ethnic discrimination in health care settings, requiring anti-bias training for health and social service providers and creating pregnancy support groups in community settings to decrease the impact on perinatal stress (Mehra et al., 2020).

Strengths and limitations

A qualitative approach enhanced the extensiveness and depth of understanding of mental well-being and its perceived social determinants among immigrant parents (Creswell & Creswell, 2017; Schenker et al., 2014). Methodological rigor was ensured by using measures for credibility (triangulation, participant right to withdraw at any time, verifying themes with original transcripts, debriefing sessions with research team), transferability (greater and more broad implications of this research in terms of the field of vulnerability during important transitional periods in life), dependability and confirmability (iterative questioning during data

collection, double-checking transcriptions against recordings, in-depth description of study methods, and the maintenance of an audit trail). During the preparation of the interview guide, we had two colleagues that were unfamiliar with the project, examine the guide and flag unclear questions. Semi-structured interviews allowed the comparison across individual accounts and the flexibility to follow up particular points and perspectives. Moreover, individual interviews allowed parents to express their views freely, avoiding the influence of social desirability biases found within groups contexts. We maximized the inclusion of several ethnic groups, which allows us to broaden the reach to a more culturally diverse sample. Few studies have considered generational differences in social factors that contribute to perinatal well-being. Another strength of our study derives from the involvement of fathers, which has been largely absent in immigrant perinatal mental health research. This study reported according to the "COREQ checklist for comprehensive reporting of qualitative studies" (Tong et al., 2007).

Our study has limitations. While we did not recruit participants that could not communicate in French or English, Canadian population data suggests that the proportion of first-generation immigrants with knowledge of at least one of Canada's official languages is very high (93.2%) (Statistics Canada, 2017). We only interviewed participants living in Quebec, potentially limiting the scope to the Canadian setting. Moreover, our findings may not generalize to refugee or asylum seekers. Nonetheless, our results identify potentially modifiable barriers and facilitators to immigrant parent's well-being. We interviewed less second-generation immigrant men because we had difficulty recruiting men for the qualitative portion of the study, which may have affected saturation. This is consistent with other studies among fathers (Holmberg, 2022; Johansson et al., 2020). However, second-generation fathers in the study described the phenomenon of parental distress and social factors influencing psychological well-being in the

same way, and that may be the essence of the lived experience of parental stress in Quebec. Despite these limitations, our findings could potentially inform policies and interventions by elucidating social factors through which cultural diversity and migration may have an impact on parent's experiences of perinatal well-being, and reduce gender disparities in the screening and treatment of perinatal distress. Future perinatal mental health research should consider stressors associated with the immigration and cultural diversity among refugee or asylum seekers, unemployed, and/or sexual minority parents.

Conclusions

Our findings identified different macro-level factors influencing perinatal well-being perceived by men and women from various ethnic and immigration backgrounds during the perinatal period. Given the stressors identified due to cultural pressures and migration-related vulnerability, interventions and resources directed at first-generation immigrant parents should be bolstered during periods of crisis (e.g. pandemics) and include more family-related support for first-generation immigrant women and employment-related support for first-generation immigrant men (e.g. support negotiating family workload and work-life balance). Furthermore, our study highlighted the effects of perceived discrimination as a psychosocial stressor on mental health outcomes, which is important in our understanding of health vulnerabilities for first-generation immigrant populations that are at increased risk for experiencing cumulative and chronic stressors. These findings suggest the need for continued efforts to challenge and eliminate discriminatory practices. This can be done by requiring anti-bias and culturally sensitive training for health and social service providers, family-supportive management, developing interventions and programs promoting the inclusion of paternal well-being in maternity care, and creating culturally safe pregnancy support groups in community settings to

decrease the impact on perinatal stress. Understanding what immigrant parents perceive to facilitate or hinder their psychological well-being can help inform the development of tailored evidence-based programs and policies to better meet the mental health needs of Canadians and reduce gender and cultural disparities in the treatment of perinatal distress.

Perinatal psychological distress is a serious public health concern as it involves long-lasting adverse effects on the well-being and social adjustment of parents and their children (Cheng et al., 2006; Dawn Kingston et al., 2012; Lupien et al., 2009; Staneva et al., 2015). This paper explored how social factors contribute to mental health through an ecosocial framework in which these factors operate at multiple levels across the life course. There is a need to obtain reproductive justice to address social inequities in health and this study contributes to the growing body of evidence on mental health in vulnerable populations.

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Table 1. Characteristics of participants

	First generation immigrant men (N=8)	Second generation immigrant men (N=2)	First generation immigrant women (N=10)	Second generation immigrant women (N=6)
Demographic variables				
Age (mean years)	35.36	31.99	34.45	34.06
Education – post secondary education N (%)	8 (100%)	1 (50%)	10 (100%)	5 (83.3%)
Employment Status - Employed N (%)	8 (100%)	2 (100%)	10 (100%)	6 (100%)
Parity (Primiparous)	6 (75%)	2 (100%)	4 (40.0%)	3 (50.0%)
Planned Pregnancy N (%) (yes)	8 (100%)	2 (100%)	8 (80.0%)	6 (100.0%)
Ethnicity N (%)				
Eastern or Western European	2 (25%)	1 (50%)	3 (30%)	2 (33.3%)
Latin American	1 (12.5%)	1 (50%)	3 (30%)	1 (16.7%)
Middle Eastern	3 (37.5%)	0 (0%)	1 (10.0%)	1 (16.7%)
East or Southeast Asian	1 (12.5%)	0 (0%)	1 (10%)	2 (33.3%)
Northern African	1 (12.5%)	0 (0%)	0 (0%)	0 (0%)
Western African	0 (0%)	0 (0%)	2 (20%)	0 (0%)
First spoken language N (%)				
English	2 (25%)	1 (50%)	3 (30%)	4 (66.7%)
French	3 (37.5%)	1 (50%)	4 (40%)	2 (33.3%)
Other	3 (37.5%)	0 (0%)	3 (30%)	0 (0%)
Migration admission status (%)				
Permanent resident: Economic class immigrant (Worker programs, Business programs, Provincial and territorial nominee)	5 (62.5%)		2 (20%)	
Permanent resident: Family class immigrant (family reunification)	0 (0%)		3 (30%)	
Temporary Resident (foreign temporary worker)	1 (10%)		1 (10%)	
Temporary Resident (foreign student)	1 (10%)		3 (30%)	
Canadian born abroad	1 (10%)		1 (10%)	
Years in Canada (mean years)	11		15	
Time with partner (mean years)	7.25	7	9.20	8.50
Household Income				
< $79,000	3 (37.5%)	0 (0%)	3 (30%)	0 (0%)
80,000–$149,000	5 (62.5%)	2 (100%)	3 (30%)	6 (100%)
> $150,000	0 (0%)	0 (0%)	4 (40%)	0 (0.0%)

Table 2. Summary of subthemes reported by group

	First generation immigrant men	Second generation immigrant men	First generation immigrant women	Second generation immigrant women
Themes *Cultural pressures*				
1.a.i. Cultural pressures regarding parenting	✓	✓	✓	✓
1. a.ii. Gender-related cultural pressures	✓	✓	✓	✓
1. a.iii. Health and baby-related practices	✓		✓	
2. Health and social service access				
2.a.i. Social benefits and resources	✓		✓	✓
2.a.ii. Systemic barriers in health care	✓		✓	
3. Discrimination				
3.a.i. Physical appearance or maternity-related		✓	✓	✓
3.a.ii. Gender-related	✓	✓		
3.a.iii. Ethnic discrimination	✓		✓	

Bridge to Manuscript Three

Manuscript one suggests that immigrant women may be particularly vulnerable to antenatal depression. Manuscript one and two expanded our understanding of modifiable barriers and facilitators that can impact perceived perinatal distress among men and women from various ethnic and immigration backgrounds during the perinatal period. Manuscript two elucidated psychosocial factors that from parents' perspective were meaningful contributors for perinatal distress and well-being and may be particularly important for parents with an immigrant background. Psychosocial factors included cultural pressures from family and society, gender-based attitudes and experiences of discrimination. Moreover, first and second-generation parents shared many of these barriers and facilitators, and similarly described the phenomenon of parental distress and social factors influencing psychological well-being when living in Quebec.

Questions remained about other forms of distress (i.e. anxiety and stress), particularly among men. Although existing research suggests high rates of antenatal and postnatal depression among immigrant women, the course of depression, anxiety and stress throughout the perinatal period and its underlying risk factors have been relatively understudied in this population. Study three built upon the first two studies by quantitatively examining other factors that may influence mental health and may be particularly important for parents with an immigrant background such as, low social support, poor couple adjustment, gender-based attitudes, family-work conflict, and experiences of discrimination.

Manuscript Three:

Prevalence and Psychosocial Determinants of Postpartum Psychological Distress Among First and Second-Generation Immigrant Parents

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Abstract

Background: Prior investigations have suggested high prevalence rates for perinatal depression among immigrant women, however, the course of depression, anxiety and stress throughout the perinatal period and its risk factors have received relatively little attention in this population. This study describes the prevalence and psychosocial determinants of psychological distress (depression, anxiety, and stress) among fathers and mothers from an immigrant background (1st and 2nd generation), compared to Canadian-born counterparts.

Methods: 152 women and 121 men (immigrant and Canadian-born) completed standardized self-report questionnaires measuring sociodemographic and psychosocial factors during third trimester of pregnancy and at 2, 6 and 12 months postpartum.

Results: The prevalence and severity of prenatal and postpartum psychological distress were similar between immigrant and Canadian-born parents. However, the severity of postpartum depressive symptoms and the prevalence of elevated depressive symptoms at 2 months postpartum were higher among immigrant mothers compared to Canadian-born mothers. With respect to the stability of symptomatology from pregnancy to postpartum, fathers showed an increase in symptoms of depression, anxiety and stress, and mothers reported increases in symptoms of depression and stress. For immigrant fathers, family-work conflict (FWC) was a significant predictor of depression, and discrimination predicted stress. For immigrant mothers, FWC predicted depression, FWC and dyadic adjustment predicted anxiety, and FWC, dyadic adjustment, and discrimination predicted stress. For Canadian-born mothers, discrimination predicted depression, and FWC predicted anxiety and stress.

Discussion: Understanding and addressing modifiable risk factors may enhance antenatal mental health screening and guide the development of targeted interventions to support the perinatal mental health needs of both immigrant and Canadian-born parents.

Keywords: Perinatal mental health; Postpartum Depression; Anxiety; Stress; Immigration

Introduction

Over 40% of Canadians have an immigrant heritage, whether as first-generation immigrants or second-generation Canadians that were born to at least one foreign-born parent (Statistics Canada, 2022). Beyond the typical stressors contributing to perinatal mental health faced by expectant families, immigrant parents may be at higher risk for perinatal psychological distress as they must navigate various migration-specific stressors and healthcare service barriers (Higginbottom et al., 2014; 2015; Merry et al., 2011; Tiwari & Wang, 2008; Tobin et al., 2018). The impact of migration-specific stressors extends beyond the first generation as second-generation immigrants must negotiate a dual cultural background by combining their heritage values and practices with the values and social norms of the host country (Schenker et al., 2014) and as they may face different discrimination in their access to healthcare.

The literature on immigration and perinatal mental health has consistently found an increased risk for antenatal and postpartum depression (PPD) among immigrant mothers compared to native-born counterparts (Anderson et al., 2017; Arshad et al., 2021; Falah-Hassani et al., 2015), with prevalence rates of elevated PPD symptoms ranging from 6 to 37% in Canadian studies (Daoud et al., 2019; Dennis et al., 2016; Nwoke et al., 2023; Saad, 2019). Heightened prevalence rates of postpartum anxiety symptoms (12.1-23.7%) among immigrant women have been reported (Dennis et al., 2018b; Farina et al., 2020; Lansakara et al., 2010; Nwoke et al., 2023), with a greater vulnerability compared to non-immigrant counterparts (Dennis et al., 2018b; Yelland et al., 2010). However, mixed findings have been reported for differences in prevalence of perinatal psychological stress between immigrant and non-immigrant mothers (Fleuriet & Sunil, 2014; Pérez-Ramírez et al., 2013; 2017).

Research to date has identified several sociodemographic risk factors for PPD among immigrant women, including younger age, minority ethnicity, shorter stay in host country, lack of proficiency in host country language, lower household income, educational attainment, and obstetric problems (Alhasanat & Fry-McComish, 2015; Anderson et al., 2017; Falah-Hassani et al., 2015). Parents with an immigrant background may face distinctive psychosocial risk factors for perinatal psychological distress that warrant specific examination, such as social support and dyadic adjustment, which have been reported as risk factors for perinatal depression among immigrant mothers and non-immigrant mothers and fathers (Anderson et al., 2017; Falah-Hassani et al., 2015; Kiviruusu et al., 2020; Philpott et al., 2019; Razurel et al., 2013; Singley & Edwards, 2015; Tobin et al., 2018). Family-work conflict (FWC) has not been examined as a risk factor for symptoms of perinatal distress among immigrant populations, however some evidence in non-immigrant samples suggest it may be a risk factor for perinatal depression and anxiety among mothers (Grice et al., 2007; 2011; Killien et al., 2001) and fathers (Chhabra et al., 2022). Gender role attitudes have been identified as a risk factor for maternal and paternal perinatal depression among non-immigrant populations (Chhabra et al., 2020; Morse et al., 2000), and may be critical among immigrant parents as the experience of migration can lead to changes in family roles and gender-role conflicts. Although less examined, previous investigations have found experiences of discrimination associated with perinatal depressive symptoms among immigrant (Ponting et al., 2020; Tobin et al., 2018; Walker et al., 2012) and ethnic minority mothers (Doherty et al., 2023; Du & Steinberg, 2023; Mehra et al., 2020; Noroña-Zhou et al., 2022; Segre et al., 2021; Surkan et al., 2006).

Immigrant fathers' experiences of perinatal psychological distress remain largely unexamined, despite research indicating that fathers also experience significant perinatal distress

(Cameron et al., 2016; Philpott et al., 2019) and that paternal well-being and involvement have a profound influence on their partner's and child's well-being (Lamb, 2004; Plantin et al., 2011). Furthermore, research on perinatal mental health among immigrants has focused heavily on symptoms of depression, while other indicators of mental health and their risk factors, such as anxiety and stress symptomatology have received less attention despite evidence that these psychological factors adversely impact parents and their children (Cheng et al., 2006; Kingston et al., 2012; Lupien et al., 2009; Staneva et al., 2015). More prospective studies are needed to examine potential predictors of postpartum distress as many previous investigations have been cross-sectional in design (Lancaster et al., 2010; Stevenson et al., 2023; Underwood et al., 2017; Waldie et al., 2015). Thus, research with a greater focus on social determinants of well-being during pregnancy and postpartum period is important for preventative strategies aimed at improving screening and treatment.

The current investigation sought to examine the prevalence of symptoms of psychological distress (depression, anxiety, and stress) during pregnancy and postpartum among fathers and mothers from an immigrant background (first and second-generation) compared to Canadian-born counterparts, and the relationship between prenatal psychosocial factors to postpartum symptoms of psychological distress. Based on prior evidence, we expected a higher prevalence of psychological distress among immigrant parents across the perinatal period compared to Canadian-born parents, and that the presence of certain social factors (i.e. poor social support, poor couple adjustment, greater gender stereotyped roles, greater FWC, and greater perceived discrimination) would be associated with greater psychological distress.

Methods

The current study is part of a larger investigation on work-family conflict and parental leave on fathers' adjustment.

Participants

Two hundred fifty-three pregnant women and their partners (first- and second-generation immigrant and Canadian-born) were recruited in their third trimester of pregnancy (28-36 weeks) primarily through social media (e.g. Instagram and Facebook ads) because of the COVID-19 pandemic (December 2021- October 2022). Also, flyers were posted in various strategic locations in Montreal (e.g. community centres, maternity stores, toy stores, daycares) and study brochures were distributed at obstetrics clinics in Montreal affiliated with the McGill University Health Centre (MUHC). Couples were eligible to participate if they a) were at least 18 years of age; b) were cohabiting c) were able to communicate in French or English; d) had access to the internet, and e) were employed. Eligible participants that indicated an interest in participating were e-mailed a link to a secured website (Research Electronic Data Capture system (REDCap)) to enter and provide informed consent and complete the standardized self-report questionnaires measuring sociodemographic and psychosocial variables during third trimester of pregnancy and at 2, 6 and 12 months postpartum. Participants received a $10 gift card following completion of each assessment. Ethics approval was granted by the Research Ethics Board of the MUHC.

Measures

<u>Completed at baseline (third trimester of pregnancy):</u>

Socio-demographic information included age, country of birth and parents' country of birth, ethnicity, education, marital status, income, primary language spoken, parity, type of community (rural/urban/suburban).

Dyadic Adjustment Scale-4 (DAS-4) (Sabourin et al., 2005) is a 4-item scale that measures level of adjustment in the couple relationship, with higher scores indicating a better relationship. Three of the four items are on a 6-point Likert scale ranging from 0 (all the time) to 5 (never), while the final item is on a 7-point scale ranging from 0 (extremely happy) to 6 (perfect). This is a widely used measure within studies of marital quality and parental adjustment (Ramchandani et al., 2011; Weinfield et al., 2009). The DAS has good psychometric properties, including reliability and validity (Weinfield et al., 2009).

Social Provisions Scale (SPS-10) (Caron, 2013) is a 10-item scale that assesses parents' support sources and the quality of support offered. Items are rated on a four-point Likert scale from 1(strongly disagree) to 4 (strongly agree). A continuous scale score is computed by summing responses to all items, with values ranging from 10 to 40, with higher scores indicating higher levels of social support. The SPS-10 has excellent psychometric properties, including internal consistency (α=0.88) (Caron, 2013) and has been translated and validated across different cultural contexts (Caron, 2013; Iapichino et al., 2016; Katsuki et al., 2020; Martínez-López et al., 2014).

The Social Roles Questionnaire (SRQ) (Baber & Tucker, 2006) is a 13-item measure to assess attitudes toward gender roles. The SRQ includes a 5-item Gender Transcendent subscale to assess attitudes about gender non-dichotomously, and an 8-item Gender-Linked subscale to assess beliefs about whether certain tasks and roles are associated with a certain gender. Respondents rate their agreement about the social roles of men and women by circling a percentage (range: 0–100% with increments of 10%). After appropriate reverse-scoring, scores were summed to determine a global "social role adherence" score. Higher global scores indicate stronger traditional social role adherence. This measure has good psychometric properties,

including validity and consistency (α=.65 for the Gender Transcendent subscale and α=.77 for the Gender-Linked subscale) (Baber & Tucker, 2006).

Work-Family Conflict Scale (Carlson et al., 2000), the 9-item family work conflict (FWC) subscale of the Work-Family Conflict Scale assessed the perceived level of family commitments and demands interfering with work. Each item was measured on a Likert scale from 1 (strongly disagree) to 5 (strongly agree). The scores of all nine items were averaged, with higher average score indicative of higher FWC. The scale has good psychometric properties, with high reliability (α=.78-.87) (Carlson et al., 2000).

Everyday Discrimination Scale (Short Version) (Sternthal et al., 2011) is the 5-item shortened version of the Everyday Discrimination Scale (Williams et al., 1997) that was used to measure discrimination in their day-to-day lives. Responses are assessed with a 5-point scale from 1 (never) to 5 (almost every day), with higher scores representing more discrimination. Participants also make an attribution for their experiences with discrimination (e.g., gender, ethnicity, immigrant status) across time points. This measure is widely used in health research (e.g. the Canadian Community Health Survey, Brown et al., 2000; Kessler et al., 1999; Schulz et al., 2006), and has been validated in various countries (Kim & Williams, 2012; Surkan et al., 2010; Williams et al., 2012).

<u>Completed at all time points:</u>

Depression Anxiety Stress Scale—21 (DASS-21) (Crawford & Henry, 2003) is comprised of 3 subscales measuring symptoms of depression, anxiety and stress (7 items each rated on a 4-point scale ("Did not apply to me at all" to "Applied to me very much, or most of the time")). Higher subscale scores indicate more severe symptoms in each dimension. A cut-off score of ≥10 on the depression subscale is used to distinguish individuals experiencing depressive symptoms, a cut-

off score of ≥8 on the anxiety subscale is used to classify those with anxiety symptoms, and a cut-off score of ≥15 is used to distinguish individuals experiencing high levels of stress (Crawford & Henry, 2003; Lovibond & Lovibond, 1995). The DASS-21 has been used in the pregnant population and culturally diverse population studies (Khodakarami et al., 2017; Nagandla et al., 2016; Norton, 2007; Scholten et al., 2017; Wang et al., 2016; Xavier et al., 2016a; 2016b). This measure has good psychometric properties, including high reliability and high convergent validity with the reliability of the scale ranging from .81 for depression, .73 for anxiety, and .81 for stress (Lovibond & Lovibond, 1995).

Analysis

The prevalence of depression, anxiety, and stress was examined using frequencies and percentages at each time point using the cut-off values noted in the Measures section above. Chi-square analyses were performed to assess group (immigrant vs. Canadian-born mothers, immigrant vs. Canadian-born fathers) differences during pregnancy and postpartum. Analyses were performed separately for each psychological measure.

The remaining analyses were conducted with participant's scores of depression, anxiety and stress symptoms. For these analyses, to increase normality, scores for the DASS subscales were log-transformed. Because preliminary analyses revealed that scores on the three subscales of the DASS-21 did not differ significantly over the three postpartum assessments, a composite score of postpartum symptom severity was calculated for each subscale. Therefore, participants who had missing data for two of the three postnatal questionnaires were not included in the following main analyses.

Chi-square analyses and one-way ANOVAs were performed to determine whether the groups differed with respect to participant characteristics (see Table 1). Group differences in

psychological distress and change over time was examined using separate (for each sex) mixed 2 (Immigrant status: first and second-generation immigrant vs. Canadian-born) x 2 (Time: Pregnancy, Postpartum) ANOVAs. Analyses were performed separately for each psychological measure.

Multiple linear regressions were performed to identify prenatal psychosocial risk factors for postpartum symptoms of psychological distress (depression, anxiety, and stress) for each group. Correlations between psychosocial variables and symptoms of psychological distress were examined to select which variables would be included in the model. Direct entry of the following variables was used to predict elevated symptoms of psychological distress during postpartum: discrimination, dyadic adjustment, FWC, gendered attitudes, and social support.

Statistical significance was set at 0.05. Data were analyzed using SPSS version 29 (IBM Corp, 2023).

Results

Participant Characteristics

At study entry, 253 mothers and 203 fathers fully completed the baseline on-line questionnaires, and among those participants, 152 women (60.1%) and 121 men (59.6%) fully completed at least two of the three postpartum on-line assessments (n= 77 immigrant mothers; n= 53 immigrant fathers, n= 75 Canadian-born mothers, n = 68 Canadian-born fathers). No significant differences were found between participants that completed at least two postpartum questionnaires and those with incomplete data for marital status, immigrant status, gender, parity, planned pregnancy, community type, discrimination, gender attitudes, social support, and depression or stress during pregnancy and postpartum (p's >.05). Participants with missing data were younger ($p<0.001$), more likely to have a language other than English or French as first

spoken language (p=0.004), less likely to be of Western and Eastern European ethnicity (p=0.014), more likely to be in the lowest income level (>$79,000) (p<0.001), less likely to have an education level greater than high school (p=0.048), reported lower dyadic adjustment (p=0.041), reported more FWC (p=0.021), and reported more anxiety during pregnancy (p=0.008) and postpartum (p=0.014) than participants with complete data.

Table 1 shows participant characteristics of the sample who completed at least two of the three postpartum timepoints. Significantly more Canadian-born fathers (95.6% vs 47.2%; X^2=36.64; p<0.001) and mothers (93.3% vs 46.8%; X^2=39.06; p<0.001) were of Western and Eastern European ethnicity compared to immigrant counterparts. Immigrant fathers were significantly more likely to be in the lowest income level (<$79,000) compared to Canadian-born fathers (19.6% vs 1.5%; X^2 =11.24, p<0.001). Concerning the highest level of income (>$150,000), Canadian-born fathers (50.7% vs 17.6%; X^2 =13.70, p<0.001) were significantly more likely to be in this group compared to immigrant fathers. Significantly more immigrant fathers and mothers reported being married (66.6% vs 35.3%; X^2=11.27; p<0.001; and 67.5% vs 38.7%; X^2=12.72; p<0.001, respectively) and reported another language other than English or French as first spoken language compared to Canadian-born counterparts (18.9% vs 0.0%; X^2=13.99; p<0.001, and 10.4% vs 0.0%; X^2=8.23; p=0.004 respectively). Mothers differed significantly regarding the type of community they lived in, with immigrant mothers living in more urban areas (59.7% vs. 32%), and less likely to live in suburban (37.7% vs. 58.7%) or rural (2.6% vs. 9.3%) areas compared to Canadian-born mothers (X^2=12.75; p=0.002).

Immigrant fathers reporting significantly more discrimination than Canadian-born fathers (g=-.705, p<0.001), and immigrant mothers reporting significantly more discrimination than Canadian-born mothers (g=-.323; p=0.047). Moreover, immigrant mothers reported significantly

greater traditional gender attitudes than Canadian-born mothers (*g*=.469; p=0.004). No significant group differences were found for age, parity, education, planned pregnancy, dyadic adjustment, FWC, and social support (p's >.05).

Prevalence of elevated symptoms of depression, anxiety, and stress for each group.

Figures 1, 2, and 3 show the prevalence for elevated symptoms of depression, anxiety and stress by group. Among fathers, no group differences were found for elevated prenatal and postpartum symptoms. Among mothers, no group differences were found for elevated prenatal and postpartum symptoms, except for the prevalence of postpartum depressive symptoms, which was higher for immigrant mothers compared to Canadian-born mothers at 2 months postpartum (26% vs 12%, X^2=4.805; p=0.028).

Severity and change of symptoms of depression, anxiety, and stress for each group

Table 2 shows scores of depression, anxiety and stress by group. Among fathers, a significant main effect of time emerged for depression scores, F(1,119)=7.798, p=.006, η_p^2=.061, anxiety scores, F(1,119)=4.190, p=.043, η_p^2=.034, and stress scores, F(1,119)=14.014, p<.001, η_p^2=.105. Scores increased significantly from pregnancy to postpartum for depression (*g*=-.262, p=.004), anxiety (*g*=-.193, p=.035), and stress (*g*=-.342, p<.001). However, the main effect of immigrant status and the interaction between time and immigrant status were not significant.

Among mothers, the interaction between time and immigrant status was not significant for depression scores. However, a significant main effect of time emerged, F(1,150)=16.074, p<.001, η_p^2=.097, indicating that depression scores increased from pregnancy to postpartum (*g*=-.324, p<.001). The main effect of immigrant status was also significant, F(1,150)=3.974, p=.048, η_p^2=.026, with immigrant mothers having higher depression scores compared to Canadian-born mothers (*g*=-.322, p=.048). There was also no significant main effect or interaction for symptoms

of anxiety. The interaction between time and immigrant status for stress scores was not significant. However, there was a significant main effect of time for symptoms of stress, $F(1,150)=23.971$, $p<.001$, $\eta_p^2=.138$, with stress levels increasing from pregnancy to postpartum ($g=-.395$, $p<.001$).

Risk factors for elevated symptoms of depression, anxiety, and stress for each group.

Multiple linear regression models were computed to identify prenatal psychosocial risk factors for postpartum symptoms of psychological distress for each group. The results are presented in Table 3.

Among immigrant fathers, FWC significantly predicted depression scores ($\beta=.358$, $t(47)=2.64$, $p=.011$) and discrimination predicted stress scores ($\beta=.341$, $t(47) = 2.59$, $p = .013$). Psychosocial predictors explained a significant proportion of variance in scores of symptoms of depression ($R^2=.29$, $F(5, 47)=3.89$, $p =.005$) and stress ($R^2=.23$, $F(5, 47)=2.87$, $p =.024$). Dyadic adjustment, social support, and gender attitudes were not statistically significant ($p > .05$). Psychosocial predictors did not explain a significant proportion of variance in scores of symptoms of anxiety ($R^2=.13$, $F(5, 47)=1.42$, $p =.235$).

Among immigrant mothers, FWC significantly predicted depression scores ($\beta=.298$, $t(71)=2.56$, $p=.013$). FWC ($\beta=.327$, $t(71)=2.81$, $p=.006$) and dyadic adjustment ($\beta=.249$, $t(71)= 2.22$, $p=.029$) significantly predicted anxiety scores. FWC ($\beta=.325$, $t(71)=2.96$, $p=.004$), dyadic adjustment ($\beta=.316$, $t(71)=2.99$, $p=.004$), and discrimination ($\beta=.245$, $t(71)=2.34$, $p=.022$) significantly predicted stress scores. Psychosocial predictors explained a significant proportion of variance in scores of symptoms of depression ($R^2=.15$, $F(5, 71)=2.57$, $p=.034$), symptoms of anxiety ($R^2=.15$, $F(5, 71)=2.49$, $p=.039$) and stress ($R^2=.24$, $F(5, 71)=4.55$, $p=.001$). Social support and gender attitudes were not statistically significant ($p >.05$).

Among Canadian-born fathers, psychosocial predictors did not explain a significant proportion of variance in scores of symptoms of depression (R^2=.11, F(5, 62)=1.49, p=.206), anxiety (R^2=.11, F(5, 62)=1.54, p=.191), and stress (R^2=.13, F(5, 62)=1.81, p=.124). Among Canadian-born mothers, discrimination significantly predicted depression scores (β=.240, t(69)=2.09, p=.040). FWC significantly predicted anxiety scores (β=.342, t(69)=2.80, p=.007) and stress scores (β=.265, t(69)=2.20, p=.031). Psychosocial predictors explained a significant proportion of variance in scores of symptoms of depression (R^2=.19, F(5, 69)=3.32, p=.010), anxiety (R^2=.21, F(5, 69)=3.66, p=.005) and stress (R^2=.23, F(5, 69)=4.12, p=.002). Dyadic adjustment, social support, and gender attitudes were not statistically significant (p >.05).

Discussion

This study sought to investigate the prevalence and severity of psychological distress during pregnancy and postpartum among parents with an immigrant background compared to Canadian-born counterparts, and to examine how psychosocial factors relate to these symptoms. Immigrant and Canadian-born parents alike experienced heightened distress levels during the perinatal period, with increases from pregnancy to postpartum and stability during postpartum. Although the severity of perinatal psychological distress was similar between immigrant and Canadian-born parents, some notable differences in psychosocial predictors of distress emerged.

Our findings add to a growing body of research that has suggested heightened prevalence rates of perinatal distress among mothers and fathers. The prevalence for symptoms of paternal anxiety observed in our study were comparable to rates found in the general population (Philpott et al., 2019). However, immigrant and Canadian-born fathers in our study reported considerably higher rates of depression and stress compared to prior research in the general population (8-

15%, and 6-8.7%, respectively) (Cameron et al., 2016; US Surgeon General, 2024; Jean-Dit-Pannel et al., 2024; Wee et al., 2015). Elevated symptoms in our study may be due to greater stress caused by the COVID-19 pandemic. A study among mothers and fathers in the postpartum period found that fathers experienced significantly elevated parenting stress levels during the pandemic compared to the year prior (Taubman Ben-Ari et al., 2021). Moreover, fathers' parental stress during COVID-19 has been associated to severity of their depressive symptoms (Cheung et al., 2022). In addition, inconsistencies may reflect the heterogeneity in measures that have been used to assess paternal psychological distress in the literature (Cameron et al., 2016; Mazza et al., 2022). Despite these differences, our study and previous findings suggest a concerning trend, wherein the rate of paternal perinatal depression is significantly greater than the 12-month prevalence among Canadian men in the general population (4.7%) (Knoll, 2017).

The prevalence of symptoms of maternal depression and anxiety observed in our study were comparable to rates found among women in the general population (Dennis et al., 2017a; Woody et al., 2017) and immigrant women (Anderson et al., 2017; Dennis et al., 2016; Falah-Hassani et al., 2015; Stevenson et al., 2023). However, the higher rate of elevated depressive symptoms at two months postpartum observed among immigrant mothers compared to their Canadian-born counterparts aligns with prior studies (Arshad et al., 2021; Falah-Hassani et al., 2015), including in other Canadian studies (Alhasanat & Fry-McComish, 2015; Anderson et al., 2017; Daoud et al., 2019; Dennis et al., 2017b; Saad, 2019; Vaillancourt et al., 2022). Mothers from an immigrant background may face unique challenges that require targeted intervention (Falah-Hassani et al., 2015).

Overall, our findings indicate that the prevalence and severity of prenatal and postpartum psychological distress were similar between immigrant and Canadian-born parents. While

perinatal anxiety and stress has not been examined among immigrant fathers previously, the prevalence of perinatal depression among Mexican American fathers (foreign-born and US-born) (Roubinov et al., 2014) has been found to be comparable to the rates observed in fathers in the general population (Cameron et al., 2016). Among women, differences in perceived stress between immigrant and non-immigrant mothers in previous research have been mixed, however, few investigations have examined these symptoms (Pérez Ramírez et al., 2013; 2017). Our findings are inconsistent with numerous investigations that have found greater perinatal anxiety among immigrant mothers compared to non-immigrant counterparts (Dennis et al., 2018b; Fleuriet & Sunil, 2014; Yelland et al., 2010). Inconsistencies may be due to the inclusion of second-generation parents in our immigrant groups that may have greater social networks and resources within the host country. Moreover, we may not have captured the most vulnerable immigrant populations compared to other studies. First-generation participants in our study have been living in the host country for a long period of time and were fluent in either English or French, which may have excluded recent immigrants or parents with low levels of acculturation (da Conceição F. Santiago & Figueiredo, 2015) that may experience a higher prevalence of mental health symptoms (Anderson et al., 2017; Chen et al., 2013; Vaillancourt et al., 2022; Zelkowitz & Tamara, 1995). Moreover, approximately half of our immigrant groups were of "Western and Eastern European" ethnicity, while studies that have reported greater distress have included samples with women primarily belonging to minority ethnicities (Dennis et al., 2018b; Fleuriet & Sunil, 2014). Parents who belong to an ethnic minority in Canada may be exposed to acculturation challenges and discrimination at a different capacity.

With respect to the stability of symptomatology from pregnancy to postpartum, our findings showed that most symptoms either increased or remained stable. Overall, there has been

a heterogeneity in trajectories of perinatal depression (Baron et al., 2017; Cameron et al., 2016; Chow et al., 2019; Falah-Hassani et al., 2015; Kiviruusu et al., 2020; Santos et al., 2017), anxiety (Ahmed et al., 2018; Alati et al., 2004; Dennis et al., 2018a; Don et al., 2014; Schubert et al., 2017) and stress (Liou et al., 2014; Monk et al., 2020; Philpott et al., 2019) reported, differing according to severity of symptoms, timing (prenatal or postpartum), and the population studied. Nonetheless, given the general persistence of symptoms, this study underscores the importance of identifying early predictors of perinatal psychological distress.

Our findings underscore the pervasive impact of discriminatory experiences as a chronic source of strain that can exacerbate distress during the postpartum period for parents. Existing research suggests that heightened stress responses and maladaptive coping strategies might explain the link between discrimination and poor physical and mental health outcomes (Ayala, 2019; Pascoe & Smart Richman, 2009; Sandberg et al., 2023). Immigrant fathers and mothers in our study, reported more discrimination than Canadian-born counterparts and discrimination was associated with postpartum stress. Prior research in Canada and the US have documented experiences of discrimination within maternity care settings among immigrant women and women with ethnic minority backgrounds (Attanasio & Kozhimannil, 2015; Baiden & Evans, 2020; Boakye et al., 2023; Mehra et al., 2020; Mohamoud, 2023; Reitmanova & Gustafson, 2008). In the US, some investigations conducted among immigrant mothers found that greater frequency or level of discrimination was a predictor of greater symptoms of perinatal depression (Ponting et al., 2020; Walker et al., 2012). While our findings did not link experiences of discrimination to depressive symptoms among immigrant participants, most previous research have been conducted among Hispanic (foreign- and US-born) populations (Ponting et al., 2020; Walker et al., 2012), where immigrant, cultural and racial contexts differ markedly.

The finding that past experiences of discrimination significantly predicted PPD symptomatology among Canadian-born mothers is particularly noteworthy, as it suggests that the psychological impacts of discrimination are not confined to populations that may traditionally be considered more susceptible to such stressors. Prior studies have documented discrimination to be associated with a greater risk for perinatal depressive symptoms among women (Doherty et al., 2023; Mehra et al., 2020; Noroña-Zhou et al., 2022; Segre et al., 2021; Surkan et al., 2006). Previous studies have found that pregnant women often face discrimination and stigma, including in the workplace, during prenatal care, and in public (Adams et al., 2016; Bombak et al., 2016; Fox & Quinn, 2015; Vaillancourt et al., 2024). Further research is warranted to explore the specific types of discrimination that contribute the most to this increased risk, and to develop targeted interventions that can effectively reduce the burden of PPD linked to discriminatory experiences (Stepanikova & Kukla, 2017).

Our findings provide initial evidence that greater FWC during pregnancy is associated with postpartum distress. Parental roles have become less polarized due to a societal shift of both partners contributing to various dimensions of family life (Lamb, 2004; May et al., 1996) and providing financially (Statistics Canada, 2016b; Ortiz-Ospina et al., 2024). Therefore, women may be anticipating the stress of returning to work after childbirth while balancing familial demands. The current literature has consistently identified the significant role of work-family conflict (WFC) and FWC on mental health and symptoms of depression and anxiety among women in the postpartum (Grice et al., 2007; 2011; Killien et al., 2001). Previous research suggests that WFC is more likely to affect fathers, and FWC impacts psychological distress among women to a greater extent than men (Allen & Finkelstein, 2014; Keene & Reynolds, 2005; Shimada, 2010). It is possible that FWC contributed to depression in immigrant

fathers, given increased familial demands in host country. The few studies that have examined work-family balance among immigrants have found associations between WFC and symptoms of psychological distress, and suggest that the immigrant experience uniquely influences work-family interactions, via cultural assumptions about work, discrimination, lost social support, the shift from collectivist to individualistic cultures, and shifts in familial roles (Lin & Lin, 2021). Moreover, first and second-generation immigrant fathers may have greater familial pressures from extended family (Vaillancourt et al., 2024) or from their partner due to a loss of social network. In fact, poorer dyadic adjustment during pregnancy was a significant predictor of anxiety and stress in immigrant mothers in our study, and has been identified in previous research as a predictor of perinatal depression and anxiety among immigrant mothers (Falah-Hassani et al., 2015; Nilaweera et al., 2014; Sharapova & Goguikian Ratcliff, 2018; Wittkowski et al., 2017; Xiong & Deng, 2020; Zelkowitz et al., 2004).

We expected social support to be protective (Anderson et al., 2017; Falah-Hassani et al., 2015; Philpott et al., 2019; Razurel et al., 2013; Singley & Edwards, 2015; Tobin et al., 2018) and more traditional gendered attitudes to be more detrimental to mental health outcomes (Chhabra et al., 2020; Morse et al., 2000). A review of Canadian studies has suggested that poorer social support may be a key mechanism underlying increased PPD among immigrants (Saad, 2019). Moreover, rigid adherence to traditional gender roles may limit both mothers' and fathers' ability to seek and receive emotional support, further contributing to psychological distress (Leung et al., 2018). It is possible that we did not have the statistical power necessary to uncover smaller effects. Moreover, our findings suggest that other factors play a role in the perinatal mental health of Canadian-born fathers. Previous studies in the broader population have identified several contributors to paternal mental health, including unplanned pregnancy, parity,

unemployment, socioeconomic status, financial stress, maternal depression, and WFC (Ansari et al., 2021; Chhabra et al., 2022; 2020; Philpott et al., 2019; 2020). It could also indicate that Canadian-born fathers may benefit from protective factors not as readily available to immigrant fathers, such as stronger social support networks or less exposure to workplace discrimination.

Our study has several strengths, including the ethnic diversity in our sample of immigrant parents, which allows us to broaden the reach to a more culturally diverse sample. While the prevalence and course of perinatal depression had been examined to a certain extent, the literature on anxiety and stress was scarce. The prospective design allowed for the examination of antenatal psychosocial risk factors that make immigrant parents more vulnerable to psychological distress extending through the first year postpartum. An important strength of our study was the inclusion of fathers, which had been scarce in perinatal mental health research among immigrant populations. This research offers insights to improve the detection and treatment of psychological distress during important transitional periods such as parenthood, ultimately helping to address gender disparities in perinatal mental health care.

Our results should be interpreted in the context of the province of Quebec, which may shape the experiences of family-work balance due to generous family policies. Despite these policies, FWC during pregnancy was still perceived to impact postpartum distress. Participants had generally greater educational attainment and higher income relative to the Canadian population. Moreover, parents had to be fluent in at least one of Canada's official languages and employed to participate in the study. These factors limit the generalizability of results to all expecting parents in Canada. Moreover, the most vulnerable in our sample may be underrepresented due to incomplete data. Compared to participants with complete data, participants with missing data reported significant differences on certain variables that could be

related with greater symptoms of psychological distress. We grouped first, and second-generation immigrant parents, which did not allow for us to draw conclusions for each group separately. However, there have been few studies examining potentially modifiable psychosocial risk factors for perinatal psychological distress among parents with an immigrant background, therefore, this data provides an important basis for future studies.

Conclusions

This study provides valuable insights into the psychological challenges faced by first and second-generation immigrant and Canadian-born parents during the perinatal period. Heightened levels of perinatal psychological distress are present among parents regardless of immigrant status, and increase during the postpartum period. Overall prenatal and postpartum psychological distress levels were similar between immigrant and Canadian-born parents, however, immigrant mothers experienced a higher severity and rate of elevated postpartum depressive symptoms compared to Canadian-born counterparts. These findings highlight the importance of considering modifiable psychological risk factors for the development of psychological distress, such as FWC, dyadic adjustment, and discrimination. Addressing the mental health needs of this population will require a holistic, culturally sensitive approach that considers the unique stressors and challenges faced by immigrant and non-immigrant parents alike. Future research should continue to explore these dynamics, with particular attention to how workplace policies, family dynamics, and societal attitudes can be tailored to support the mental health of both immigrant and non-immigrant parents.

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Table 1. Participant characteristics (mean ± SD)

	1st & 2nd Gen Immigrants men (N=53)	Canadian-born men (N=68)	1st & 2nd Gen Immigrants women (N=77)	Canadian-born women (N=75)	Total participants (N=273)
Demographic variables					
Age (years)	35.27 (6.67)	33.80 (4.19)	33.36 (5.40)	32.09 (3.71)	33.49 (5.09)
Ethnicity N (%)					
Western and Eastern European	25 (47.2%)	65 (95.6%)	36 (46.8%)	70 (93.3%)	196 (71.8%)
Middle Eastern	5 (9.4%)	0 (0.0%)	8 (10.4%)	0 (0.0%)	13 (4.8%)
East Asian	5 (9.4%)	0 (0.0%)	9 (11.7%)	1 (1.3%)	15 (5.5%)
South Asian	6 (11.3%)	0 (0.0%)	6 (7.8%)	0 (0.0%)	12 (4.4%)
East, Middle, Western, Southern African	4 (7.5%)	0 (0.0%)	2 (2.6%)	0 (0.0%)	6 (2.2%)
Northern African	3 (5.7%)	0 (0.0%)	3 (3.9%)	0 (0.0%)	6 (2.2%)
Latin American	5 (9.4%)	0 (0.0%)	11 (14.3%)	0 (0.0%)	16 (5.9%)
Oceania	0 (0.0%)	0 (0.0%)	1 (1.3%)	0 (0.0%)	1 (0.4%)
Indigenous Peoples of North America	0 (0.0%)	1 (1.5%)	0 (0.0%)	2 (2.7%)	3 (1.1%)
Unknown	0 (0.0%)	2 (2.9%)	1 (1.3%)	2 (2.7%)	5 (1.8%)
First spoken language N (%)					
English	29 (54.7%)	24 (35.3%)	42 (54.5%)	30 (40.0%)	125 (45.8%)
French	14 (26.4%)	44 (64.7%)	27 (35.1%)	45 (60.0%)	130 (47.6%)
Other	10 (18.9%)	0 (0.0%)	8 (10.4%)	0 (0.0%)	18 (6.6%)
Marital Status N (%)					
Married	35 (66.6%)	24 (35.3%)	52 (67.5%)	29 (38.7%)	140 (51.3%)
Living Common-Law	18 (34.0%)	44 (64.7%)	25 (32.5%)	46 (61.3%)	133 (48.7%)
Education (more than high school)	50 (94.3%)	64 (94.1%)	76 (98.7%)	73 (97.3%)	369 (73.4%)
Income					
< $40,000	1 (2.0)	0 (0.0%)	1 (1.3%)	0 (0.0%)	2 (0.7%)
41,000–$79,000	9 (17.6%)	1 (1.5%)	8 (10.7%)	9 (12.0%)	27 (10.1%)
$80,000-149,000	32 (62.7%)	32 (47.8%)	39 (52.0%)	32 (42.7%)	135 (50.4%)
>150,000	9 (17.6%)	34 (50.7%)	27 (36.0%)	34 (45.3%)	104 (38.8%)
Parity (Primiparous)	30 (56.6%)	41 (60.3%)	42 (54.5%)	48 (64.0%)	161 (59.0%)

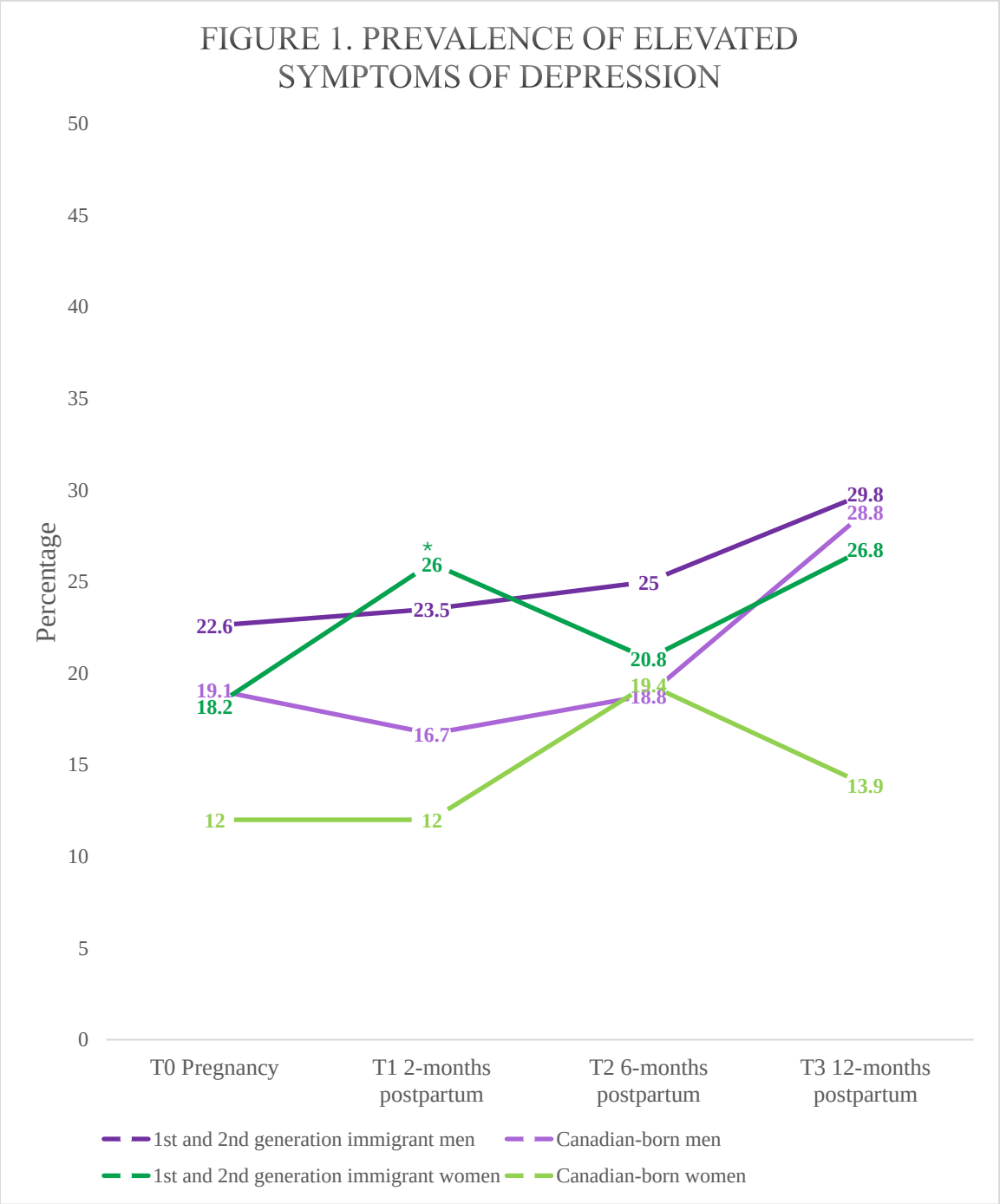
Planned Pregnancy N (%) (yes)	48 (90.6%)	56 (82.4%)	57 (74.0%)	64 (85.3%)	225 (82.4%)
Community type N (%)					
Urban	32 (60.4%)	38 (55.9%)	46 (59.7%)	24 (32%)	140 (51.3%)
Suburban	20 (37.7%)	25 (36.8%)	29 (37.7%)	44 (58.7%)	118 (43.2%)
Rural	1 (1.9%)	5 (7.4%)	2 (2.6%)	7 (9.3%)	15 (5.5%)
Psychological variables					
Depressive Symptoms (DASS 21-D)					
Baseline	5.77 (7.58)	4.32 (6.67)	4.96 (5.02)	3.57 (4.43)	4.58 (5.91)
3 months postpartum[a]	5.29 (6.73)	4.27 (5.89)	6.16 (7.21)	4.19 (4.21)	4.98 (6.10)
6 months postpartum[b]	5.73 (6.93)	4.56 (6.81)	5.78 (6.22)	5.03 (6.06)	5.26 (6.46)
12 months postpartum[c]	6.60 (7.20)	5.48 (7.70)	5.24 (5.00)	3.89 (4.63)	5.17 (6.18)
Anxiety Symptoms (DASS 21-A)					
Baseline	4.19 (4.81)	2.53 (4.25)	5.27 (5.01)	5.01 (6.22)	4.31 (5.45)
3 months postpartum[a]	3.18 (4.60)	2.79 (4.50)	4.47 (5.43)	4.13 (6.41)	3.72 (5.39)
6 months postpartum[b]	4.19 (5.81)	2.78 (4.96)	4.28 (4.26)	3.81 (5.34)	3.76 (5.08)
12 months postpartum[c]	4.64 (6.71)	3.39 (5.71)	4.93 (5.55)	3.81 (4.57)	4.16 (5.58)
Stress Symptoms (DASS 21-S)					
Baseline	10.19 (9.46)	8.06 (6.22)	10.57 (7.43)	10.24 (7.42)	9.78 (7.62)
3 months postpartum[a]	10.31 (7.83)	9.09 (7.13)	12.10 (9.01)	12.56 (8.37)	11.15 (8.26)
6 months postpartum[b]	10.42 (8.32)	9.78 (6.70)	12.86 (8.55)	12.81 (8.28)	11.60 (8.08)
12 months postpartum[c]	11.28 (8.59)	9.88 (8.01)	13.83 (9.29)	13.08 (8.01)	12.13 (8.60)
DAS-4 (M (SD))	14.49 (1.44)	14.49 (1.31)	14.40 (1.46)	14.13 (1.23)	14.37 (1.36)
EDS (M (SD))	9.19 (3.39)	7.16 (2.36)	8.74 (2.81)	7.85 (2.63)	8.19 (2.87)
FWC (M (SD))	1.89 (0.91)	1.57 (0.53)	1.77 (0.63)	1.62 (0.63)	1.70 (0.68)
SPS (M (SD))	33.87 (5.26)	34.97 (6.07)	33.83 (6.59)	35.53 (5.87)	34.59 (6.04)
SRQ (M (SD))	20.83 (15.10)	19.76 (13.79)	16.90 (12.76)	11.71 (8.88)	16.95 (13.03)

Note. DASS-21= Depression Anxiety and Stress Scale 21; *DAS-4* = dyadic adjustment Scale; EDS=Everyday Discrimination Scale Short Version; FWC= Family work conflict; SPS= Social Provisions Scale; SRQ= Social Roles Questionnaire;

[a]1st and 2nd generation immigrant men N=51, Canadian-born men N=66, 1st and 2nd generation immigrant women (N=77), Canadian-born women (N=75), total N=269

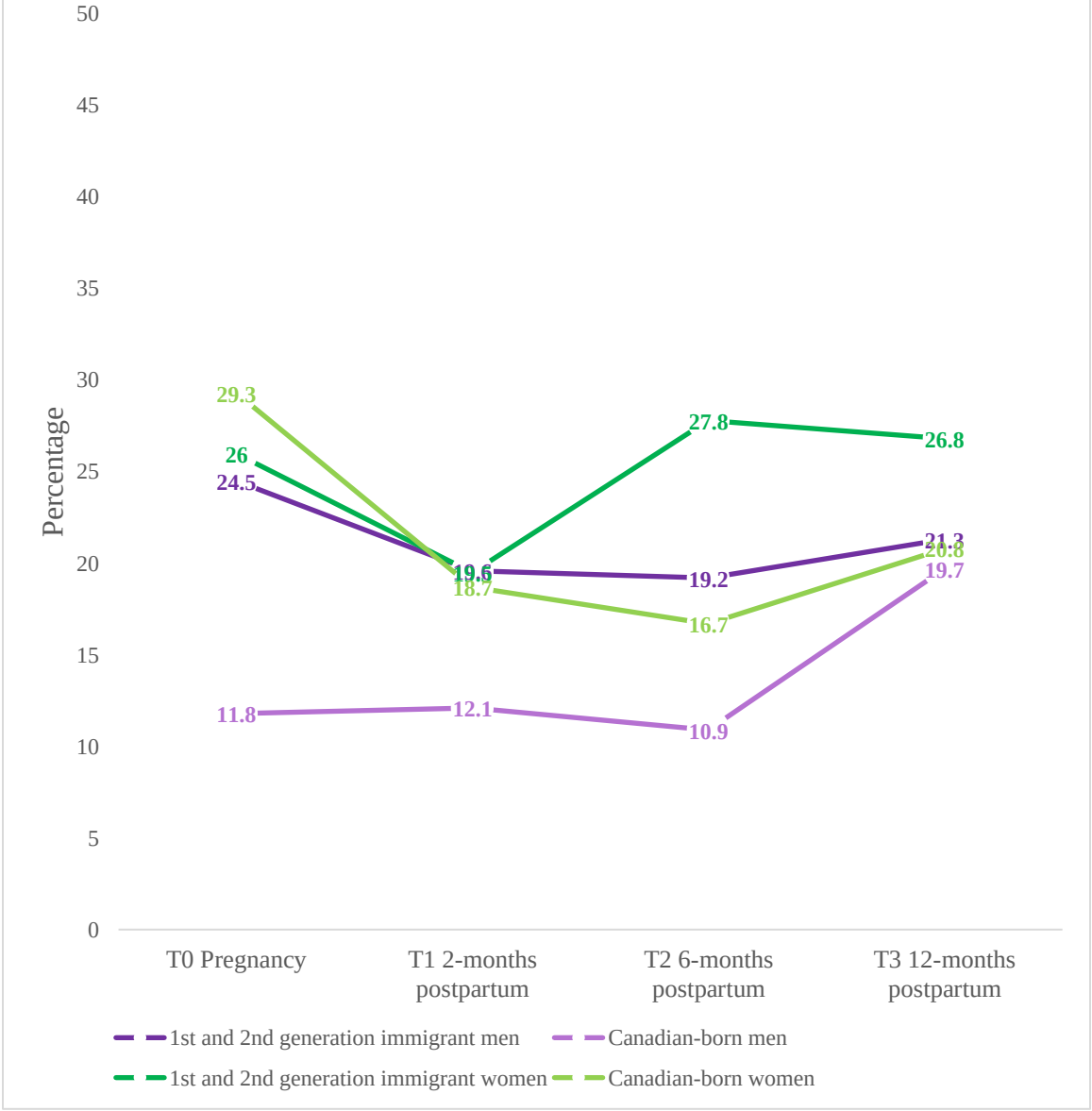
[b]1st and 2nd generation immigrant men N=52, Canadian-born men N=64, 1st and 2nd generation immigrant women N=72, Canadian-born women N=72, N=260

[c]1st and 2nd generation immigrant men N=47, Canadian-born men N=66, 1st and 2nd generation immigrant women N=71, Canadian-born women N=72, total N=256



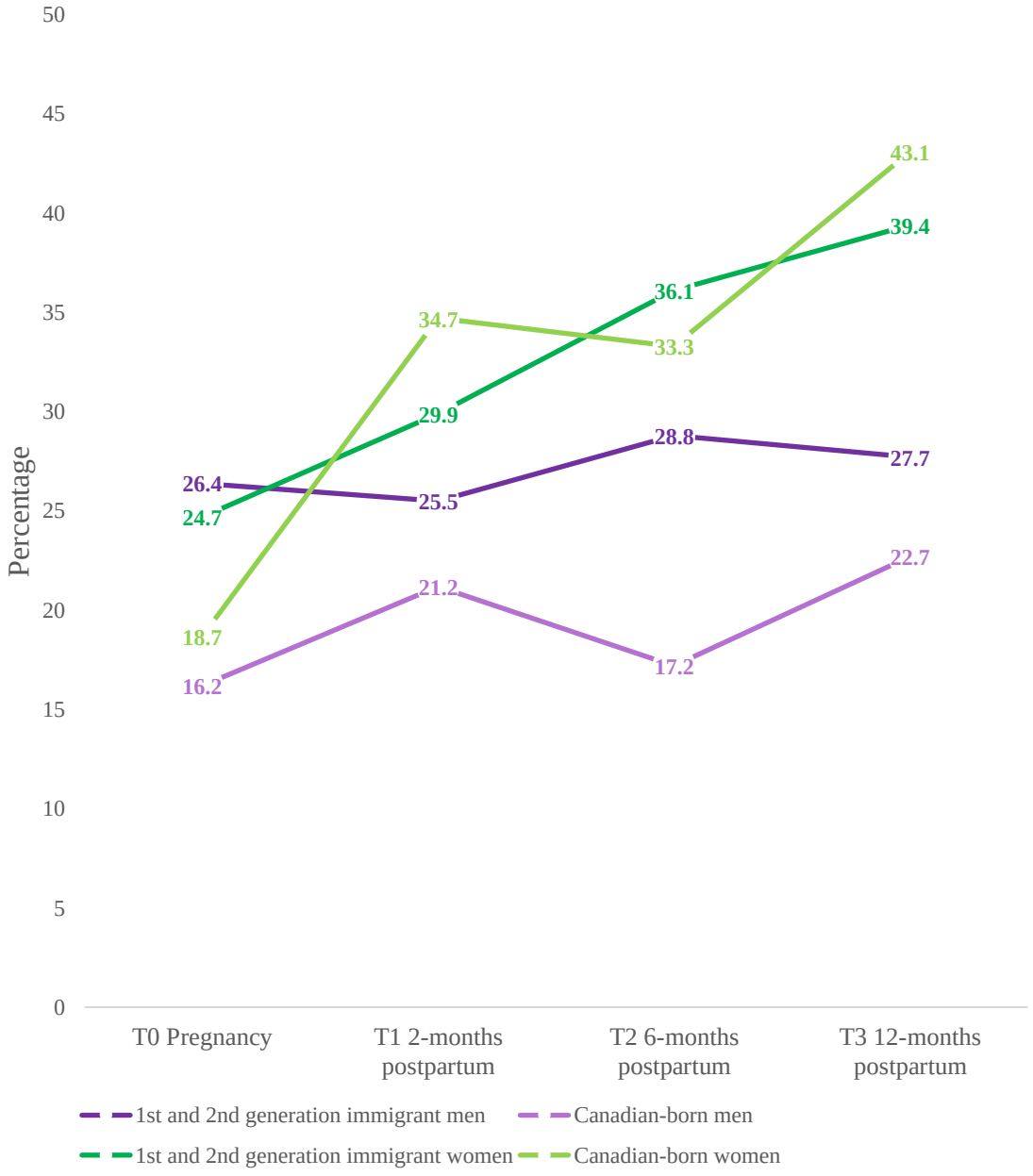
Note. T0= 1st and 2nd generation immigrant men N=53; Canadian-born men N=68; 1st and 2nd generation immigrant women N= 77; Canadian-born women N=75
T1= 1st and 2nd generation immigrant men N=51; Canadian-born men N=66; 1st and 2nd generation immigrant women N= 77; Canadian-born women N=75
T2= 1st and 2nd generation immigrant men N=52; Canadian-born men N=64; 1st and 2nd generation immigrant women N=72; Canadian-born women N=72
T3= 1st and 2nd generation immigrant men N=47; Canadian-born men N=66; 1st and 2nd generation immigrant women N=71; Canadian-born women N=72

FIGURE 2. PREVALENCE OF ELEVATED SYMPTOMS OF ANXIETY



Note. T0= 1st and 2nd generation immigrant men N=53; Canadian-born men N=68; 1st and 2nd generation immigrant women N= 77; Canadian-born women N=75
T1= 1st and 2nd generation immigrant men N=51; Canadian-born men N=66; 1st and 2nd generation immigrant women N= 77; Canadian-born women N=75
T2= 1st and 2nd generation immigrant men N=52; Canadian-born men N=64; 1st and 2nd generation immigrant women N=72; Canadian-born women N=72
T3= 1st and 2nd generation immigrant men N=47; Canadian-born men N=66; 1st and 2nd generation immigrant women N=71; Canadian-born women N=72

FIGURE 3. PREVALENCE OF ELEVATED SYMPTOMS OF STRESS



Note. T0= 1st and 2nd generation immigrant men N=53; Canadian-born men N=68; 1st and 2nd generation immigrant women N= 77; Canadian-born women N=75
T1= 1st and 2nd generation immigrant men N=51; Canadian-born men N=66; 1st and 2nd generation immigrant women N= 77; Canadian-born women N=75
T2= 1st and 2nd generation immigrant men N=52; Canadian-born men N=64; 1st and 2nd generation immigrant women N=72; Canadian-born women N=72
T3= 1st and 2nd generation immigrant men N=47; Canadian-born men N=66; 1st and 2nd generation immigrant women N=71; Canadian-born women N=72

Table 2. ANOVA results with mean (± SD) psychological distress scores.

	1st & 2nd Gen Immigrants men (N=53)	Canadian-born men (N=68)	Main effect	Interaction effect	1st & 2nd Gen Immigrants women (N=77)	Canadian-born women (N=75)	Main effect	Interaction effect
Depressive Symptoms (DASS 21-D)							Time F (1,150) =16.074, p<.001 Immigrant Status F (1,150) =3.974, p=.048	
Pregnancy	0.60 (0.46)	0.47 (0.47)	Time F(1,119) =7.798, p=.006		0.60 (0.43)	0.48 (0.41)		
Postpartum	0.66 (0.41)	0.57 (0.42)			0.71 (0.34)	0.62 (0.33)		
Anxiety Symptoms (DASS 21-A)			Time F(1,119) =4.190, p=.043					
Pregnancy	0.46 (0.48)	0.34 (0.40)			0.64 (0.40)	0.57 (0.45)		
Postpartum	0.51 (0.40)	0.43 (0.38)			0.61 (0.37)	0.54 (0.37)		
Stress Symptoms (DASS 21-S)			Time F(1,119) =14.014, p<.001				Time F (1,150) =23.971, p<.001	
Pregnancy	0.83 (0.51)	0.82 (0.41)			0.94 (0.38)	0.94 (0.35)		
Postpartum	0.95 (0.36)	0.94 (0.32)			1.05 (0.33)	1.08 (0.25)		

Note. DASS-21=Depression Anxiety Stress Scale-21

Scores for the DASS subscales were log-transformed.

A composite score of postpartum symptom severity was calculated for each subscale.

Table 3. Results of linear regression analyses predicting symptoms of psychological distress during postpartum.

Depressive Symptoms

	1st & 2nd Gen Immigrants men			Canadian-born men			1st & 2nd Gen Immigrants women			Canadian-born women		
Variables	*β*	*p*	*95% CI*	*β*	*p*	*95% CI*	*β*	*p*	*95%CI*	*β*	*p*	*95% CI*
Social Support	-.199	.161	[-.04, .01]	-.232	.115	[-.04, .00]	-.086	.475	[-.02, .01]	-.035	.765	[-.02, .01]
Gender attitudes	-.101	.442	[-.01, .00]	-.031	.800	[-.01, .01]	.114	.332	[-.00, .01]	.175	.137	[-.00, .02]
Discrimination	.135	.293	[-.01, .05]	.018	.894	[-.05, .05]	.167	.134	[-.01, .05]	**.240**	**.040**	**[.00, .06]**
Dyadic adjustment	-.126	.335	[-.06, .02]	.079	.545	[-.02, .04]	.106	.346	[-.02, .04]	-.098	.428	[-.04, .02]
Family-work conflict	**.358**	**.011**	**[.04, .28]**	.185	.151	[-.06, .35]	**0.298**	**.013**	**[.04, .29]**	.188	.131	[-.03, .23]
	R^2= 0.29, Adj R^2= 0.22, F(5, 47) = 3.89, p =.005.			R^2= 0.11, Adj R^2= 0.04, F(5, 62) = 1.49, p =.206.			R^2= 0.15, Adj R^2= 0.09, F(5, 71) = 2.57, p =.034			R^2= 0.19, Adj R^2= 0.14, F(5, 69) = 3.32, p =.010		

Anxiety Symptoms

	1st & 2nd Gen Immigrants men			Canadian-born men			1st & 2nd Gen Immigrants women			Canadian-born women		
Variables	*β*	*p*	*95% CI*	*β*	*p*	*95% CI*	*β*	*p*	*95% CI*	*β*	*p*	*95% CI*
Social Support	-.071	.650	[-.03, .02]	-.093	.522	[-.02, .01]	-.018	.881	[-.02, .01]	.026	.821	[-.01, .02]
Gender attitudes	.115	.428	[-.01, .01]	.110	.365	[-.00, .01]	.128	.278	[-.00, .01]	.070	.545	[-.01, .01]
Discrimination	.262	.069	[-.00, .06]	.079	.559	[-.03, .06]	.022	.846	[-.03, .03]	.163	.157	[-.01, .06]
Dyadic adjustment	.002	.986	[-.05, .05]	.111	.392	[-.02, .04]	**.249**	**.029**	**[.00, .07]**	-.071	.558	[-.05, .02]
Family-work conflict	.133	.379	[-.07, .19]	.238	.066	[-.01, .36]	**.327**	**.006**	**[.06, .33]**	**.342**	**.007**	**[.06, .35]**
	R^2= 0.13, Adj R^2= 0.04, F(5, 47) = 1.42, p =.235			R^2= 0.11, Adj R^2= 0.04, F(5, 62) = 1.54, p =.191.			R^2= 0.15, Adj R^2= 0.09, F(5, 71) = 2.49, p =.039			R^2= 0.21, Adj R^2= 0.15, F(5, 69) = 3.66, p =.005		

Stress Symptoms

	1st & 2nd Gen Immigrants men			Canadian-born men			1st & 2nd Gen Immigrants women			Canadian-born women		
Variables	*β*	*p*	*95% CI*	*β*	*p*	*95% CI*	*β*	*p*	*95% CI*	*β*	*p*	*95% CI*
Social Support	-.034	.818	[-.02, .02]	-.048	.740	[-.02, .01]	.001	.993	[-.01, .01]	.068	.550	[-.01, .01]
Gender attitudes	-.132	.334	[-.01, .00]	.007	.955	[-.01, .01]	.003	.978	[-.00, .00]	.188	.103	[-.00, .01]
Discrimination	**.341**	**.013**	**[0.01, 0.06]**	.182	.179	[-.01, .06]	**.245**	**.022**	**[.00, .05]**	.161	.157	[-.01, .04]
Dyadic adjustment	-.096	.479	[-.05, .03]	-.099	.441	[-.04, .02]	**.316**	**.004**	**[.01, .07]**	-.168	.165	[-.04, .01]
Family-work conflict	.241	.094	[-.02, .21]	.199	.118	[-.03, .27]	**.325**	**.004**	**[.06, .29]**	**.265**	**.031**	**[.01, .20]**
	R^2= 0.23, Adj R^2= 0.15, F(5, 47) = 2.87, p =.024			R^2= 0.13, Adj R^2= 0.06, F(5, 62) = 1.81, p =.124.			R^2= 0.24, Adj R^2= 0.19, F(5, 71) = 4.55, p =.001.			R^2= 0.23, Adj R^2= 0.17, F(5, 69) = 4.12, p =.002.		

Note. CI= confidence interval; Significant (p < .05) are bolded.

General Discussion

Becoming a parent is an exciting and rewarding life transition, however, this period is also accompanied by various challenges that can impact mental health. Previous research suggests that psychological distress during the perinatal period can adversely impact health outcomes and social adjustment for the parents and offspring. Expectant immigrant parents may experience an elevated risk of perinatal distress due to migration-related stressors and barriers to accessing healthcare. However, little is known about the prevalence and psychosocial predictors among immigrant parents, particularly fathers. This dissertation contributes to knowledge on the prevalence and modifiable facilitators and barriers of perinatal psychological distress and well-being at multiple levels, in particular among parents with an immigrant background. The insights gained from the present work are of relevance to healthcare providers and researchers who work with and support expectant parents, as well as policy makers within the Canadian health system.

Summary of Findings

Manuscript one described the prevalence and early determinants of antenatal depression among recent, long-term immigrant and Canadian-born women. These findings provide further evidence that women are at risk for antenatal depression, and suggests that immigrant women may be particularly vulnerable. Regression analyses showed psychological risk factors for the development of depressive symptoms such as perceived stress and pregnancy-specific anxiety among immigrants. Given the adverse outcomes associated with symptoms of perinatal psychological distress and that immigrant women are less likely to seek help for mental health issues due to various social barriers, there is a need to target women at risk by providing culturally tailored support resources and follow-ups during the perinatal period. The implications of pregnancy-specific anxiety and stress as modifiable risk factors for the development of

antenatal depression identified early in pregnancy may help to improve antenatal screening and inform the development of tailored interventions to better meet the mental health needs of immigrant women during the perinatal period.

Perceived contributors to perinatal psychological distress among immigrant parents, particularly fathers, have been underexplored. Manuscript two explored first and second-generation immigrant mothers' and fathers' lived experiences of social stressors and facilitators of perinatal psychological well-being. A qualitative methodology was used to help identify what psychosocial factors were most meaningful to immigrant populations, which might differ from those traditionally studied in other populations and may not be captured by quantitative measures. Including second-generation parents allowed us to better understand the impact of migration on perinatal well-being because second-generation parents may have shared similar cultural influences with first-generation immigrant parents without the stressors associated with the immigration experience. Parents perceived different macro-level social factors influencing perinatal well-being : cultural pressures, health and social service access, and discrimination. First and second-generation parents shared many barriers and facilitators influencing psychological well-being. However, first-generation immigrant parents reported greater acculturative stress and ethnic discrimination concerns related to their distress. Among men, barriers included feeling as though the paternal role was undervalued by society and receiving inadequate support during healthcare. Our findings highlight the need for continued efforts to address discrimination in various settings (e.g. maternity care and employment), bolstering support for first-generation immigrant parents (e.g. family-related and work-life balance support), and to address gender disparities (e.g. equitable inclusion of paternity in perinatal care).

Manuscript three built upon the first two studies by describing the prevalence of various symptoms of psychological distress (depression, anxiety, and stress) during pregnancy and postpartum, and examining antenatal psychosocial contributors of postpartum psychological distress among immigrant (first and second-generation) and Canadian-born fathers and mothers. Heightened levels of antenatal distress were present among parents regardless of immigrant status and increased at postpartum. Similar to manuscript one, a greater prevalence of elevated postpartum depressive symptoms was found among immigrant mothers compared to Canadian-born mothers. Among immigrant fathers, FWC increased the risk of postpartum depression, and discrimination was associated with postpartum stress. For immigrant mothers, FWC increased the risk of postpartum depression, FWC and dyadic adjustment was associated with postpartum anxiety and stress, and discrimination was associated with postpartum stress. These findings were in line with the findings from manuscript two. Our findings provide further evidence that men are at risk for perinatal distress, and highlight the importance of modifiable psychosocial risk factors for perinatal psychological distress in immigrant and non-immigrant parents. A comprehensive and culturally sensitive approach is necessary to address the mental health needs of this population, accounting for the distinctive stressors and challenges faced by both immigrant and non-immigrant parents.

Strengths and Limitations

Findings from this dissertation contribute to our understanding of perinatal well-being in vulnerable populations, particularly among immigrant parents. The ethnic diversity in our samples is a strength that allows for a broader reach of our findings to culturally diverse populations. However, the participants in our studies were all in heterosexual dyads, and had generally greater educational attainment and higher income relative to the Canadian population,

which limit the generalizability of results to all expecting parents in Canada. Generally, immigrant participants in our studies had been living in Canada for an extended period and had to be fluent in at least one of Canada's official languages, which limit the generalizability of results to more vulnerable immigrant subgroups, such as refugee or asylum seekers. For individuals whose first language is not one of Canada's official languages, proficiency in either language can pose significant challenges during the perinatal period. While receiving healthcare, effectively communicating one's intended meaning and comprehending instructions may be more difficult (Kwame, 2016). Therefore, the lack of a language barrier as stressor in our studies may have a protective effect and we could expect parents facing additional language challenges could experience even higher levels of perinatal psychological distress. Future research should aim to use community-based participatory research principles to include parents from more vulnerable immigrant subgroups, and when funding is available, translate questionnaires to most prevalent languages among immigrants within the population studied, especially among groups with greater difficulties with the local language (Font & Méndez, 2013; Katigbak et al., 2016). However, a mental health report by Statistics Canada suggests investing more in mental health services for established immigrants given most existing settlement services mainly target newly arrived immigrants (Ng & Zhang, 2020). Therefore, the investigation of perinatal mental health among established immigrants' also warrants our consideration to inform interventions to address mental health in this population over time.

Due to the COVID-19 pandemic, we had to shift most of our recruitment strategy online instead of in-person at hospitals and clinics, which led to challenges in recruiting a greater sample size and we had greater attrition than previous studies with similar methodology (i.e. multiple follow-ups of self-report questionnaires completed online). Other factors that may

influence mental health and help-seeking behaviours, such as, socioeconomic status, immigrant admission status, and dyadic factors (partner's immigrant status or gender-based attitudes) were not included in the analyses of study three as it was outside the primary scope of this research, and they could not be added as covariates given the sample size. Moreover, in study three, we grouped first and second-generation immigrant parents. We had initially planned to compare first-generation immigrant, second-generation immigrant, and Canadian-born parents, however we decided to group immigrant parents due to the smaller sample size, long duration of time living in Canada among first-generation immigrants, and similar acculturation scores between first- and second-generation immigrants. There have been other perinatal mental health studies in the US that have grouped immigrant parents with those with the same ancestry (Coburn et al., 2016; Fleuriet & Sunil, 2014; Preciado & D'Anna-Hernandez, 2017; Roubinov et al., 2014; Zambrana et al., 1997). However, in the latter studies it was not possible to know how far removed the US-born parents were from their immigrant background because they were selected according to self-identification to their ancestry and they do not report generational data, moreover, these studies have been primarily among Mexican Americans. Although the inclusion of second-generation immigrants in our immigrant sample did not allow for us to draw conclusions for each immigrant group separately, there have been few studies examining potentially modifiable psychosocial risk factors for perinatal psychological distress among parents with an immigrant background, therefore, this data still provides an important basis for future studies.

Prior research on perinatal mental health among immigrants has primarily focused on maternal PPD, while other types of psychological distress, such as anxiety and stress have received less attention despite evidence demonstrating the detrimental impact of these

psychological factors on both parents and their offspring (Cheng et al., 2006; Kingston et al., 2012; Lupien et al., 2009; Staneva et al., 2015). The prospective approaches used in studies one and three are a key strength, permitting the examination of antenatal psychosocial risk factors that make immigrant parents more vulnerable to depression in late pregnancy (study one) and postpartum depression, anxiety and stress (study three). An important strength of study two and three is the inclusion of fathers, which has been absent in immigrant perinatal mental health research. Including men in family research is essential for a more equitable society, for advancements in men's mental health, and for the well-being of families given the associated physical and psychological outcomes among their partners (e.g. PPD, pregnancy and birth complications) and their child's well-being and development (e.g. child's attachment security, emotional or behavioral problems, school performance) (Chavis, 2022; Philpott, 2023).

Another strength of this work is the inclusion of a qualitative study, which provided a rich account of parental perspectives and insights that may not have been adequately reflected in quantitative assessments that have been primarily developed and validated using samples of individuals belonging to the dominant culture (Creswell & Creswell, 2017). The insights from this work could inform policies and evidence-based interventions by elucidating modifiable psychosocial factors through which cultural diversity and the immigrant experience may impact perinatal psychological distress and well-being, and encourage the equitable screening and treatment of perinatal distress across genders. Results also highlight how much remains unknown about the multidimensional and complex contributors to perinatal psychological well-being among immigrant parents. Future directions for research in this population is discussed in the subsequent section of this dissertation.

Future Directions

Research

Intersectionality/Diversity. It is crucial to recognize the substantial diversity within immigrant populations, and to strive to comprehend and address their distinct experiences. Future perinatal mental health research among immigrants should aim to include participants from diverse socioeconomic and immigrant backgrounds (i.e. admission classes, refugee, asylum seekers), and consider social stressors associated with immigration and cultural diversity. Within the first five months of 2016, a quarter of admitted migrants to Canada were refugees (Statistics Canada, 2016a). Refugees and asylum seekers may have experienced trauma before or during the migration process, and may have fewer resources for integration (e.g. language skills, education, or relevant work experience) (Bustamante et al., 2017; Morassaei et al., 2022). Although, economic class immigrants are selected based on their potential to participate in the Canadian labor market, and may have better post-migration health outcomes (e.g. health care utilization, self-rated health and mental health, and chronic illnesses) (Morassaei et al., 2022), they still face many barriers to employment (e.g. overqualified or mismatched for jobs) that can lead to lower well-being (Chen et al., 2010). Therefore, determinants to perinatal well-being among all immigrant admission classes should to be examined. Notably, emerging evidence points to social determinants in the post-migration environment, such as socioeconomic status, employment, and experiences of discrimination, as the most influential factors shaping the mental health outcomes of immigrant and refugee populations (Immigrant and Refugee Mental Health, 2023). Additionally, while most research and settlement resources have focused on the integration of newly arrived immigrants, future investigations should examine how these post-migration social

determinants impact mental health and well-being over time (Ng & Zhang, 2020; Stewart et al., 2015).

Given recent initiatives aimed at a more balanced geographic distribution and settlement of immigrants across Canada (Immigration Refugees and Citizenship Canada, 2020), future studies should consider environmental and contextual factors (e.g. urban versus rural settlement, and regional cultural influences). It is necessary to have appropriate services available in all regions of the country (Conseil canadien pour les réfugiés, 2016). While current evidence is promising, research is needed to assess whether culturally and linguistically tailored mental health interventions for immigrant and minority ethnic groups can be effectively delivered through e-health modalities (e.g. tele-counselling) and to identify which are the most suitable (Dorstyn et al., 2013; Salameh et al., 2023; Yellowlees et al., 2008).

The findings from this research and the literature suggests a concerning trend, wherein the rate of paternal perinatal depression and anxiety exceed the estimates among men in the general population (Knoll, 2017; Leiferman et al., 2021). More prospective research on perinatal distress among immigrant men and associated risk factors is needed to guide the development of evidence-based 'father friendly' practices and policies to promote the well-being of fathers in Canada. The inclusion of men has been absent in perinatal mental health research among immigrants, as fathers continue to be overlooked as central to family life compared to mothers. In North America, the mental health of immigrant fathers and the impact of immigration on fatherhood has been studied among Mexican American men (Capps et al., 2010; Roubinov et al., 2014). But such studies are few and far between. Notably, the social and political context impacting migration and support for immigrants within the host country are different between the United States and Canada. Moreover, Canada welcomes many refugee and asylum seekers.

These men may experience different pre-migration trauma compared to women due to experiences that are more common among men, such as the greater frequency and intensity of physical combat and witnessing violence. Thus, the examination of foreign-born fathers' mental health within the Canadian context warrants investigation among men from different ethnic backgrounds and with different reasons for migration. Notably, the development of measurement tools for perinatal distress that are tailored for men should be considered in future research, and integrate symptomology that has been reported in other cultures among men. While instruments used to screen for maternal perinatal depression have been somewhat validated for men (Álvarez-García et al., 2024), currently, there are no empirically validated measurement tools uniquely developed to assess perinatal depression or anxiety among fathers (Berg et al., 2022; Chavis, 2022; Mazza et al., 2022; Philpott et al., 2020). Fathers with perinatal depression may exhibit symptoms that differ from low mood, such as excessive self-criticism, restlessness, irritability, and aggression (Chavis, 2022).

Additionally, we acknowledge that not all individuals who experience pregnancy, childbirth, and parenting identify as women (DeRoche et al., 2023). We used the term "women" and "mothers" as that was the population of the study in the studies composing this dissertation. Individuals with intersecting marginalized identities may be particularly impacted by perinatal mental health disparities. Therefore, future research should use an intersectional approach (Crenshaw, 1989) to investigate differences in mental health outcomes across immigration-related measures (e.g. admission classes, country of origin, presence of a discernible accent) and to social identities and positions (e.g. socioeconomic status, visible minority status, gender identity, sexual orientation) (DeRoche et al., 2023; Polic, 2016; Tobón et al., 2024). However, research limitations pose significant challenges in studying the mental health of immigrant

subgroups and examining the intersections of multiple statuses and identities because this would require large-scale population data to enable a sufficient sample size for multivariate analyses (Morassaei et al., 2022).

Family work conflict. Returning to work after giving birth is another stressful transition for working parents. Our findings add to the evidence suggesting that the conflicts in the family-to-work direction warrant serious consideration due to their significant impact on mental health outcomes (Reimann & Diewald, 2022). Given parent's shift towards the caregiver-provider dual roles and the influence of FWC, the prospective study of determinants of FWC warrants further investigation to guide the development of evidence-based coping strategies and policies for working parents. Both work and family domains can exacerbate or mitigate the perceived strain by parents (Li & Zerle-Elsässer, 2023). Previous research suggests that each type of conflict are separate constructs with distinct determinants and consequences, with the most significant predictors of WFC conflict being related to the work environment/stressors (e.g. flexibility), while home-related factors/stressors (e.g. number of children, positive family relationship, relationship quality) are the most significant predictors of FWC conflict (Aycan & Eskin, 2005; Byron, 2005; Hammer et al., 2004; Michel et al., 2011; Noor, 2004; Pedersen et al., 2009). However, the distinct impact of these factors on WFC and FWC between women and men remain is largely undetermined (Bilodeau et al., 2020).

There remains a scarcity of research examining men's experiences balancing work and family after childbirth and mental health outcomes, as the majority of studies have been conducted with mothers (Dagher et al., 2011; Frye & Breaugh, 2004; Goodman & Crouter, 2009; Grice et al., 2007; Grice et al., 2011; Marshall & Tracy, 2009). It would be interesting to examine whether both family and work-related factors impact immigrant men's FWC during the

perinatal period. In our qualitative study, both first and second-generation parents experienced cultural pressures related to parenting by family members (Vaillancourt et al., 2024). First and second-generation immigrant fathers may experience greater familial pressures from their partner due to a loss of social network, and from extended family that can cause strain with competing work demands (Rudolph et al., 2014). However, a recent study in Germany found that perceived couple and family relationship factors were not associated with FWC among fathers (Li & Zerle-Elsässer, 2023). Despite the Western societal shift of sharing family and work responsibilities, men during the perinatal period have reported deeming their work role to be more salient to their identity (Kaźmierczak & Karasiewicz, 2019). Some work-related factors identified as protective of work-life balance, and consequently wellbeing, have included autonomy, flexible schedules, supportive colleagues, generous leave policies, and low occupational strain (Dagher et al., 2011; Frye & Breaugh, 2004; Grice et al., 2007; Li & Zerle-Elsässer, 2023). Forthcoming research should explore these workplace and organizational elements that alleviate or mitigate the challenges associated with reconciling professional and familial responsibilities, and develop interventions to assist parents in navigating such conflicts.

This is particularly timely given the increase in remote and hybrid employment and associated adverse psychological outcomes (Mika Ruchama et al., 2023). The COVID-19 pandemic blurred the lines between work and family/home life, potentially leading to tensions between work and family responsibilities due to changes in the workplace and home environment (Elahi et al., 2022). Moreover, the increased flexibility in work time and location enabled by evolving technologies has been found to exacerbate work-family conflict and reduce family satisfaction due to expectations of constant availability of employees (Olson-Buchanan et al., 2016). While these work characteristics that cross boundaries at home are likely significant,

the existing research has yet to thoroughly explore their full impact on how parents manage the demands of their work and family lives (Li & Zerle-Elsässer, 2023).

Discrimination. Our results align with findings of other studies that have examined the association between discrimination and mental health outcomes in the general population (Carter et al., 2017; Lewis et al., 2015), among first and second-generation immigrants (Ceri et al., 2017; Escamilla & Saasa, 2020; George et al., 2015; Giuliani et al., 2018; Held et al., 2022; Lewis et al., 2015; Saasa et al., 2022; Schmitt, 2014; Szaflarski & Bauldry, 2019), and perinatal depression among mothers (Doherty et al., 2023; Du & Steinberg, 2023; Mehra et al., 2020; Noroña-Zhou et al., 2022; Segre et al., 2021; Surkan et al., 2006). These findings underscore the need for healthcare providers to address the potential impact of discrimination for postpartum mental health, ensuring that appropriate support systems are in place to mitigate these effects and promote better psychological outcomes for all parents, regardless of their background (Bécares & Atatoa-Carr, 2016; Watson, 2019).

Parents may face discrimination in various forms, such as those related to pregnancy, gender, ethnicity, immigration status, or cultural practices, and in different settings (e.g. during maternity care or at work), which may compound the challenges they already encounter as new parents and contribute to their levels of perinatal distress (Vaillancourt et al., 2024). For example, immigrant men in our research reported parental discrimination and cultural clashes with colleagues to impact their perinatal well-being (Vaillancourt et al., 2024). Therefore, paternal interventions providing employment-related support, such as negotiating family workload and work-life balance may be particularly beneficial for immigrant fathers. While the examination of racial or ethnic discrimination among immigrant expecting parents warrants consideration, limiting the examination of discrimination to racial factors may understate the

impact of discrimination on perinatal health outcomes. Therefore, future research should recognize that individuals simultaneously occupy multiple social identities.

Recognizing the impact of systemic discrimination, such as racism or sexism, shifts the focus from individualizing mental health challenges to addressing the underlying structural factors (Matthews et al., 2021). This increased awareness has led to advocacy for proactive interventions that target the social causes of mental health issues (Cénat, 2020). This is particularly timely given the rise of far right and nationalist political parties globally, which are largely anti-immigration (Bieber, 2018). Public attitudes about immigrants tend to become more unfavorable when far-right political parties gain prominence in the electoral campaigns (Dekeyser & Freedman, 2023). In the past decade, various societal (e.g. hate crimes like the Quebec City Mosque shooting, COVID-19 related East Asian discrimination) and political (e.g. language requirement for temporary foreign workers and immigrants by the Coalition Avenir Québec political party) events in the province of Quebec have been indirectly and directly discriminatory towards immigrants (Statistics Canada, 2020; Lou et al., 2022; Montpetit, 2023; Rojas, 2023; Wu et al., 2021). These situations negatively impact the mental health of both first- and second-generation immigrants (Lou et al., 2022; Wu et al., 2021).

Recent changes to the Charter of the French language in the province of Quebec only permits bodies of the civil administration, such as health care services, to use a language other than French to provide services to immigrants only during the first six months following their arrival (Jolin-Barrette, 2022). These laws may disproportionately disadvantage marginalized populations who lack the resources to advocate for themselves. Sociopolitical environments that are discriminatory towards immigrants (e.g. exclusionary policies) have been associated with adverse immigrant mental health (Crookes et al., 2022). For example, during the Trump

administration in the US, a higher risk of adverse perinatal mental (e.g. anxiety) and physical outcomes (e.g. low birthweight and preterm birth) have been associated with political stressors among Latina mothers (both US- and foreign-born) (Fox, 2022; Gutierrez & Dollar, 2023; Heckert, 2020). Further research should continue to explore the mechanisms through which macro-level discrimination influences postpartum stress and identify protective factors that may buffer against its negative effects.

Acculturation. The process of adapting to a new culture is complex and multidimensional and acculturation is an important construct to examine in the context of health disparities. Acculturation refers to the changes (e.g. behaviors, values, and identity) that occur due to the sustained contact to a new culture or cultural environment (i.e. "dominant/host culture") that is different from the one in which an individual has been socialized (i.e. "heritage culture" of birth or upbringing) (Berry, 1997; Redfield et al., 1936). Given the perceived impact of cultural pressures on perinatal well-being that were identified by parents in our research (Vaillancourt et al., 2024), it would be interesting to examine whether parent's acculturation level may influence their experiences of cultural pressures and ultimately their perinatal well-being. The few studies that have examined the relationships between acculturation and parental mental health during the perinatal period have primarily been for PPD, among Hispanic American mothers, included second or third generation migrants, and findings have been inconsistent (Beck, 2006; Chakraborty & Chakraborty, 2010; Lara-Cinisomo et al., 2019). Most of the research on mothers has found that among more recent or less accultured immigrants, there are better perinatal health outcomes. Thus, in some cases it appears that risk for perinatal depressive symptoms and poor perinatal outcome is actually *higher* in more acculturated immigrant women (Alhasanat & Giurgescu, 2017; Callister & Birkhead, 2002; Davila et al.,

2009; Fortner et al., 2011; Gupta et al., 2013). For example, in a study among Hispanic women (89% Mexican immigrant women), antenatal depression increased with greater acculturation to the host culture (i.e. increase in social experiences with Anglophones) and decrease in heritage acculturation (i.e. decrease in Mexican ethnic behaviors/traditions such as traditional celebrations) (Martinez-Schallmoser et al., 2003). Whether the increase in distress with higher acculturation among immigrant women is influenced by accumulative acculturative stress, discrimination, or perhaps conflict within social support network due to changed behaviors or values has yet to be determined. Greater acculturation to host culture and maintenance of heritage culture is hypothesized to be beneficial for psychological and sociocultural adjustment (Nguyen & Benet-Martínez, 2013).

However, level of acculturation may impact other psychological symptoms such as stress and anxiety differently. In a recent study, less acculturated Hispanic women reported greater pregnancy-related anxiety (worries concerning the medical system, their health and safety in childbirth) (Mahrer et al., 2020). However, acculturation was measured via proxy of ethnicity (Latina vs Non-Hispanic White) and language preference (Spanish-preference vs English-preference for interview) (Mahrer et al., 2020). Similarly, in a study among Hispanic women, bicultural acculturation was related to lower levels of stress in pregnancy (Chasan-Taber et al., 2019) and lower trait anxiety (de Mendoza et al., 2016) compared to lower acculturation. In other studies, no relationship was found between acculturation and perinatal symptoms of depression or anxiety (Beck, 2006; D'Anna-Hernandez et al., 2015; Preciado & D'Anna-Hernandez, 2017; Valentine et al., 2011). The inconsistent results between acculturation and health outcomes reported in previous studies may in part be due to differences in operationalization and measurement of this construct (Fox et al., 2017; Lara-Cinisomo et al., 2019). Many studies in

health research have used proxies of acculturation (e.g. nativity, naturalization, length of residence in host country, host language ability, place of education, generational status) (Anderson & Finch, 2017; Beck, 2006; Beck et al., 2005; Capps et al., 2010; El-Khoury et al., 2018), which does not account for an individual's experiences with and perception of acculturation (Rudmin, 2009) and can create inaccurate associations to health outcomes (Fox et al., 2017). Therefore, current recommendations are to use multi- or bidimensional models that include the measurement of both independent heritage (i.e. value and maintain their heritage culture) and dominant cultural (i.e. participate in the host culture) dimensions, which allows for a more accurate examination of relationships between acculturation and health outcomes (Beck, 2006; Fox et al., 2017; Ryder et al., 2000).

Acculturation may also be meaningful for Canadian-born individuals with a foreign ethnic background, who may choose to retain their heritage culture intergenerationally. Heritage and mainstream cultural acculturation levels among these individuals may influence health outcomes differently. More research using multi- or bi-dimensional models of acculturation is needed to understand how the adaptation to the host culture and the conservation of the heritage culture may be protective against depression, anxiety, and stress during the perinatal period.

Perspectives for Policy

Within the socioecological framework, multiple levels impact individuals' mental health. The findings from this work contribute to the literature that can aid to inform public health policy, including decisions about where to spend public funds. The high prevalence of depressive symptoms among parents in pregnancy and the postpartum underlines the need for a greater access to screening and follow-up (Vaillancourt et al., 2021; Vaillancourt et al., 2024). The rates of perinatal psychological illnesses and symptoms have increased since the onset of the COVID-

19 pandemic (Carter et al., 2023). A recent report by the U.S. Surgeon General has highlighted that depression, anxiety, and stress in parents is currently at an all-time high (U.S. General, 2024). The mental health services currently available to individuals experiencing perinatal mental health challenges in Canada are generally insufficient, and these issues have been exacerbated by the pandemic (Canadian Perinatal Mental Health Collaborative, 2022). Existing programs and policies have not aligned with the latest evidence-based practices or the broader scientific understanding in this field. In Canada, the costs associated with perinatal mental health problems is estimated to be 6.7 billion annually (Montreuil & O'Donnell, 2023). Enacting public policies that focus on decreasing the impact of the social determinants of health is necessary to promote mental health outcomes for immigrant and non-immigrant parents on a broader scale.

Unlike the United Kingdom and Australia, Canada does not currently have a national perinatal mental health strategy. The absence of coordinated national guidelines for perinatal mental health care has been identified as the most significant barrier to adequate perinatal mental health care by Canadian perinatal care providers (DeRoche et al., 2023). Policymakers and relevant stakeholders must devise a comprehensive strategy to incorporate routine screening for perinatal mental health issues, as well as ensure that treatment options for those experiencing such illnesses are accessible and culturally appropriate throughout Canada (Canadian Perinatal Mental Health Collaborative, 2022; Hooykaas, 2021). In 2023, the Government of Canada announced that it has provided funding for the Women's College Hospital to develop a National Clinical Practice Guideline for Perinatal Mental Illness and a corresponding guide for patients and families. Ultimately, policymakers and lawmakers have the power to influence social systems. The ensuing recommendations are for legislators and policymakers to enhance the mental health of parents, including immigrant-specific recommendations.

Perinatal mental health curriculum and ongoing training programs for healthcare providers.

Healthcare providers feel that they lack the necessary training and resources to effectively support parents experiencing perinatal mental health challenges. According to a Canadian survey of perinatal healthcare providers, 57% have not received specialized perinatal mental health training (Hicks et al., 2022). Healthcare providers should be provided with increased education opportunities and mandated cultural safety and competency training to be more effective at providing care to immigrant parents (Lluch et al., 2023; O'Mahony & Clark, 2021). For example, in Ontario the "Refugee Mental Health Project" includes two accredited online courses, a community of practice, a toolkit of resources, and a webinar series to build the knowledge and skills of healthcare providers, settlement workers and social workers regarding refugee mental health (Morassaei et al., 2022). Another example is the self-directed and online "Immigrant and Refugee Mental Health Project" course, which was developed at the Centre for Addiction and Mental Health to help social and healthcare providers support the mental health of immigrants and refugees during the post-migration period (Centre for Addiction and Mental Health, 2023). While this is a good start, training should be available throughout providers careers. Fostering cultural humility is a lifelong process of self-reflection and learning to acknowledge individual and societal biases (Carter et al., 2023; Centre for Addiction and Mental Health, 2023). Cultural competency training enables the tailoring and explanation of care plans to accommodate patients' needs that may diverge from conventional care standards and enables patients to feel empowered to draw upon the strengths of their identity, culture, and community (Lluch et al., 2023). Cultural safety and competency training should also be mandated for primary care and emergency physicians as they may frequently be a first point of contact (Tiagi, 2016). Prior research

suggests that immigrant populations often turn to their family physicians for support regarding mental health concerns, rather than utilizing more specialized mental health care services (Centre for Addiction and Mental Health, 2023; Islam et al., 2018).

Perinatal mental health assessments and evaluation of psychosocial risk factors during pregnancy through the first postpartum year.

Currently, most parents are not screened during the perinatal period, and therefore many individuals with perinatal mental health issues are never identified (Hicks et al., 2022; Hooykaas, 2021). According to a Canadian survey of perinatal healthcare providers, 87% do not have a standardized workplace policy for perinatal mental health screening (Hicks et al., 2022). While the current recommendations from the Canadian Task Force on Preventive Health Care does not recommend systematic instrument-based screening for perinatal mental health symptoms (Lang et al., 2022), a national group of perinatal mental health experts have stated that this may cause harm and exacerbate health disparities, and that the appropriate use of instrument-based screening can yield greater benefits than risks (Pierce et al., 2024). In the absence of systematic screening procedures, the burden for bringing symptoms to the attention of healthcare providers rests with the patients, which can lead to disparities, particularly among immigrant populations.

Access to culturally appropriate perinatal mental health treatment and support.

Implementing psychological and psychosocial interventions during the antenatal period is cost-efficient and effective at mitigating the development of postpartum depression and anxiety (Howard & Khalifeh, 2020). However, parents frequently encounter substantial barriers in accessing support, including high personal cost and prolonged wait periods for receiving treatment. According to healthcare practitioners, among patients that were able to receive screening and indicated needing intervention, 42% reported a wait time of two months or more to

access perinatal mental health services (Hicks et al., 2022). Immigrant populations may require additional support to address their mental health concerns due to cultural, social, and structural factors (Ganann et al., 2020). For example, they may experience a lack of familiarity with the mental healthcare services available in Canada, as such forms of support are less common and potentially stigmatized in their countries of origin (Durbin et al., 2014). Although stigma surrounding mental health issues, which delays help-seeking, is prevalent in many cultures, including Canadian culture, it has been found to be particularly relevant for immigrants, as they may experience concerns about discrimination from their own ethno-cultural community or family members, as well as fear of societal perceptions of them as a burden (Kwame, 2016). Moreover, it is essential to modify laws and policies that are discriminatory towards immigrant and minority populations to enable access to care (e.g. changes to the Charter of the French language by Bill 96, which impact public healthcare service in languages other than French beyond six months after arrival in Québec (Jolin-Barrette, 2022)).

Mental health service providers should recognize the heterogeneity of immigrant and refugee populations when addressing their mental health needs, rather than applying a one-size-fits-all approach (Centre for Addiction and Mental Health, 2023). Developing and implementing culturally sensitive mental health interventions, and evaluating their efficacy, could help address the unique needs of immigrant parents during the perinatal period. Eight systematic reviews and meta-analyses have concluded that culturally adapted psychotherapies improve outcomes, with therapies tailored for a specific cultural group being more effective (Huey Jr et al., 2014).

While recent studies of culturally adapted therapies for maternal perinatal depression have demonstrated feasibility, acceptability (e.g. greater patient satisfaction compared to standard care), and preliminary promise for improving mental health outcomes (Coo et al., 2021;

Husain et al., 2024; Jesse et al., 2015; Jidong et al., 2023, 2024; Le et al., 2023; Nisar et al., 2020; Sattar et al. 2024; Yeshitila et al., 2024), they remain to be studied for efficacy with randomized controlled trials (Ahmed et al., 2023). For example, a recent randomized controlled trial examining a culturally adapted intervention among British south Asian women with postnatal depression found that the intervention was associated with a higher proportion of patients recovering from postnatal depression compared with the control group (treatment as usual) at 4 months after randomization, however, significant differences in recovery between the intervention and control groups were not sustained by the 12 month follow-up (Husain et al., 2024). The earlier recovery observed in the intervention group, even without significant long-term differences, is a notable finding because postnatal depression can impair optimal childcare and lead to adverse child development outcomes (Netsi et al., 2018; Waqas et al., 2023). However, further research is needed to develop ways to maintain the long-term benefits of these interventions in a scalable manner as the existing literature on the efficacy of perinatal psychological treatments for minority ethnic populations is scarce.

Evidence indicates that psychotherapy groups consisting of same-race participants are more effective compared to groups with participants from diverse racial backgrounds (Griner & Smith, 2006). Additionally, matching therapists and clients by language was found to enhance the efficacy of the intervention by approximately twofold (Griner & Smith, 2006). For many cultures, having strong social support from family is important during this life transition. Culturally appropriate services should include those that focus on family- and community-centred care and support, and that reduce stigma (Conseil canadien pour les réfugiés, 2016). When working with immigrant parents, it is important to recognize the role of their support networks and, with the client's consent, collaborate with these individuals as partners in the care

planning process (Carter et al., 2023). Considering the collectivist cultural orientation prevalent in many non-Western countries, the availability of social support groups, religious communities, and ethnic communities can be particularly beneficial for migrants that have lost their social network.

The inclusion of fathers in perinatal care.

The current health care programs leave men feeling unprepared and disregard paternal mental health experiences, leading to gender disparities in the screening and treatment of distress during this important transitional period for Canadians. It is essential to ensure that the national perinatal mental health strategy be inclusive towards men. This is particularly relevant and timely given the increasing shift towards greater father engagement in Canada and this group's vulnerability to psychological distress during the perinatal period. This strategy should include polices to integrate paternal mental health screening during routine maternity care, improve the training of health care professionals with respect to paternal perinatal mental health, and implement the development of interventions and programs that are culturally safe by including men's coping styles and particular needs (Chavis, 2022).

Workplace practices.

Workplace practices should support parents in their family involvement without foregoing their career prospective. Although generous family policies like affordable daycare and paid parental, maternal, and paternal leaves are in place, these policies may be insufficient to mitigate the impact of family-work conflict on perinatal mental health. Implementing seamless transitioning from parental leave to affordable childcare can support both the parents and the child. Preventative measures to address excessive workload, less disruptive work conditions, and flexible temporal and spatial arrangements during workdays may serve as initial steps to mitigate

work-family conflicts (Molina, 2021; Verweij, 2021). The workplace provides an opportune environment to promote parental supportive culture, as social support from supervisors and coworkers has been found as a significant contributor to perinatal mental well-being (Jones et al., 2022). Moreover, employers can increase the exposure and accessibility of perinatal resources to employees (e.g. guide of resources, hand-outs in administrative offices, or in email newsletters) (Smith et al., 2022).

Conclusion

The present dissertation contributes to knowledge on the prevalence of perinatal psychological distress and the modifiable psychosocial facilitators and barriers among parents with an immigrant background. The findings suggest heightened levels of psychological distress among parents regardless of immigrant status and that immigrant women may be particularly vulnerable to perinatal depression. This research provides further evidence that men are at risk for perinatal distress, and suggests that fathers perceive the paternal role as undervalued by society and inadequate support during healthcare as barriers to perinatal well-being. Taken together, the findings highlight the importance of modifiable psychosocial risk factors, such as perceived stress, pregnancy-specific anxiety, family-work conflict, dyadic adjustment, cultural pressures, health care access, mental health stigma, and experiences of discrimination for the development of perinatal psychological distress among immigrant parents. This dissertation also highlights certain gaps in the literature on immigrant mental health during the transition to parenthood. Considering the intersectionality of social identities, experiences of discrimination, family-work dynamics, and acculturation are important future considerations in the study of immigrant mental health during the transition to parenthood. The knowledge from these studies has implications for the well-being of parents and their children, both during the perinatal period

and beyond. The findings from the present work are of relevance to healthcare providers, researchers, and policymakers, as they provide insights to guide the development of tailored, evidence-based programs and policies aimed at addressing the mental health needs of immigrant parents and mitigating gender disparities in the screening and treatment of perinatal distress.

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Funding Statement

Social Sciences and Humanities Research Council provided financial support for this work through a Doctoral training award. Additional funding was provided by the Department of Psychology at McGill University and my supervisor, Dr. Deborah Da Costa, through her funding sources.