Disparities in Autonomy during Pregnancy in Canada: Findings from the national RESPCCT Study

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ABSTRACT

To date, the discourse on bodily autonomy has been narrowly focused on contraception and abortion and needs to be expanded to include experiences of agency during pregnancy and birth. Disrespect and mistreatment are widely reported in low resource countries but very little is known about experiences of perinatal care in high resource countries and how to improve care for minoritized populations.

Methods

We examine experiences of autonomy in decision-making during pregnancy among people who were pregnant in Canada between 2009 and 2022, using a large national dataset of patient-reported experiences and outcomes that were collected via a cross-sectional online survey. We measured autonomy with a globally validated patient-reported experience measure, the *My Autonomy in Decision-Making* (MADM) scale. To assess variations in autonomy by identity or life circumstances, we conducted multivariable regression analyses, controlling for pregnancy year, repeat observations, and place of residence and stratifying by model of care (physician or midwife-led). In a separate analysis, we tested contextual factors such as onset of prenatal care, length of appointments, and model of care (physician-led or midwife-led) that might reduce disparities in autonomy among minoritized childbearing people.

Findings

Diverse participants (n=5389) reported on 7049 interactions with healthcare providers. In the adjusted models, autonomy scores were significantly lower among those with high school education or less (physician-led care: IRR=0.86, 95 % CI: 0.82-0.92; midwife-led care: IRR=0.93, 95% CI: 0.88-0.98) and newcomers to Canada (physician-led care: IRR=0.97, 95 % CI: 0.93-0.99).

Scores were higher among pregnant people with majorized identities and circumstances, i.e. those who reported low discrimination (physician-led care: IRR=1.21, 95 % CI: 1.15-1.26; midwife-led care: IRR=1.06, 95% CI: 1.02-1.11), no disability (physician-led care: IRR=1.07, 95 % CI: 1.02-1.13; midwife-led care: IRR=1.04, 95% CI: 1.00-1.09), no need for social services (physician-led care: IRR=1.11, 95 % CI: 1.04-1.19; midwife-led care: IRR=1.13, 95% CI: 1.06-1.21), identified as heterosexual (physician-led care: IRR=1.10, 95 % CI: 1.06-1.15; midwife-led care: IRR=1.03, 95% CI: 1.01-1.06), Cis gender (midwife-led care: IRR=1.08, 95% CI: 1.01-1.16), and had sufficient income to meet financial obligations (physician-led care: IRR=1.18, 95 % CI: 1.11-1.24), compared to the reference groups.

Several modifiable factors were linked to higher autonomy, including early entry into prenatal care, sufficient time during prenatal appointments, and midwife-led care. Midwife led care was the only contextual factor that was associated with significant increases in autonomy scores for minoritized people.

Conclusions

Self-determination, including the ability to lead decisions during pregnancy, birth and the postpartum period, is a reproductive right, yet minoritized communities reported significant loss of autonomy. Differences persisted across models of care, pointing to structural inequities in patient-led decision-making during pregnancy.

Keywords

Autonomy; MADM; decision-making; pregnancy; health systems; respectful maternity care; health equity; patient experience

The ability of childbearing people to lead decisions about their care is a reproductive right (1–3). Healthcare providers facilitate autonomous decision-making by communicating the best available evidence in a neutral manner using lay language, checking with patients to ensure they have understood all the information, considering their cultural and personal preferences, and supporting their decisions (4). Promoting autonomy in decision-making is central to providing high-quality, person-centered pregnancy care (5). Violations of patient autonomy in perinatal care include ignoring the wishes and preferences of pregnant people, performing tests and procedures without consent, using coercion and threats, biased communication and disregarding or minimizing the knowledge of people about their own bodies or cultural practices (4,6,7). Disregard for autonomy during perinatal care is a uniquely gendered problem, where power is enacted on the bodies of women and childbearing people both subtly and with force (8,9). For these reasons, autonomy in perinatal care is also a core component of eliminating mistreatment and promoting respectful care (10).

A considerable body of qualitative studies illustrate that feeling a loss of control during birth can negatively affect people's birth experience (11,12), lead to lasting trauma (12), and erode trust between patients, their providers and ultimately the health system (12–14). Emerging quantitative studies on the subject demonstrate that violations of patient autonomy is associated with postpartum mental health problems, such as depression and post-traumatic stress disorder (PTSD) (15–17). Loss of autonomy also affects health professional trainees, e.g. PTSD symptoms have been reported by midwifery students who observed loss of autonomy during clinical placements (18).

Disparities in perinatal autonomy in Canada

Childbearing people in Canada are treated differently based on their characteristics and life circumstances, because of how colonialism, racism, ableism, weight stigma, and other systems of oppression privilege some and disadvantage others (1). These systems of oppressions operate simultaneously and can disproportionally affect those with intersecting identities and life circumstances (19,20). Canada's colonial history of reproductive oppression and practices such as forced sterilization, relocation for birth (also referred to as maternal evacuation policy), and referrals to child protective services (birth alerts), have disproportionately harmed Indigenous communities and childbearing people with disabilities (21–25).

Studies suggest there are inequities in the lived experience of decision-making for pregnant and childbearing people with marginalized identities and life circumstances. In one Canadian study from British Columbia (n=2051) childbearing people with medical or social risk factors, less education, and those who reported discrimination from healthcare providers based on their race or ethnicity were less likely to experience autonomy in decision-making (26). Newcomers to Canada have reported that their preferences are not respected when they receive perinatal care (27). Muslim immigrant women in Newfoundland have noted that their cultural and religious needs were disrespected, and when they advocated for their needs, they were met with frustration and anger from healthcare providers (28). Childbearing people with disabilities in Ontario reported ableist assumptions from healthcare providers, lack of knowledge about their condition, were sometimes treated disrespectfully and not always invited to participate in decisions around their care (29). People with disabilities feared judgement and discrimination from healthcare providers and reported that health care providers lacked awareness of how to accommodate childbearing people with disabilities (25). Women with high

pre-pregnancy body mass index (BMI) were more likely to report disrespectful care and loss of autonomy compared to people of normal BMI in a pan Canadian study (30). Empirical evidence about factors that improve perinatal experiences is also emerging in Canada, including midwifery care, longer prenatal appointments (Vedam et al., 2019) and honouring Indigenous rights to incorporate culture and ceremony (32). Factors that might close or widen the gap in perinatal experiences among minoritized service users remain mostly unexplored in Canada, especially in large scale, national studies.

To address this gap, we examine experiences of autonomy in decision-making during pregnancy among people who were pregnant in Canada between 2009 and 2022, using a large national dataset of patient-reported experiences and outcomes. We hypothesized that violations of autonomy are embedded in structural inequities, and exacerbated by social position, adverse life circumstances, pregnancy factors and context of care (33,34). Groups who have been marginalized on the basis of Indigeneity, immigrant status, disability, gender, substance use, socio-economic status, among other social factors, may face power inequities around decision-making, as has been documented with related aspects of perinatal care experiences in Canada (29,35,36). Understanding potential levers for improving pregnant people's ability to lead decisions about their care is central to improving perinatal experiences. To this end, we hypothesized that model of care (midwife versus physician-led) and context of care, such as access to early prenatal care, enough time during prenatal appointments, and access to one's preferred prenatal provider might reduce or eliminate inequities in autonomy during pregnancy among minoritized perinatal service users.

METHODS

Theoretical frameworks

The current paper is situated within *The Research Examining Stories of Pregnancy & Childbirth in Canada Today (RESPCCT)* study, a multi-phase, national, community participatory action research (CPAR) project (37). Several tenets of CPAR make it a promising path to addressing inequities in experiences of perinatal care. These include a framework informed by the principles of reproductive justice and health system accountability (37–39), the centering of lived experiences of oppressed groups in every phase of research to account for power imbalances; and the focus on actionable findings to reduce inequities.

The authors of the current paper position themselves as clinicians, parents, community health workers, and researchers with lived experiences as well as extensive exposure to perinatal health systems and work with diverse populations of service users in Canada. One author is an Anishinaabe scholar with experience working and living in an Indigenous community; and other authors self-identify as minoritized by racial, immigrant status, sexual or gender identity, and/or living with disabilities. These perspectives are embedded in our approach to the analysis and interpretation phases of the RESPCCT study (37)

We integrated an intersectionality lens into our inquiry as it is not only complementary to the principles of CPAR and reproductive justice, but also recognizes that disparities in perinatal care do not stem from isolated, individual factors but rather from the interplay of "interlocking systems of power" (20), including the unequal distribution of access to midwifery care and other factors known to be associated with increased autonomy. Additionally, and in keeping with CPAR principles, we prioritize

being responsive to communities through a strengths-based approach to analysis, querying factors within the care context that may be amenable to change (19,40).

Study design and recruitment

The RESPCCT study team included a Community Steering Council (CSC), multidisciplinary investigators, community health workers, and leaders from professional associations. Commencing with the recruitment of a CSC that represented minoritized populations of perinatal service users, the study progressed through a systematic review identifying 210+ validated indicators of respect and disrespect (2018-2020); prioritizing items through a formal multi-stakeholder Delphi process; identifying sociodemographic variables for inclusion; online survey construction; and pilot testing by 60 service users with diverse identities. The online survey was disseminated through social media, non-governmental organization (NGO) partners and professional bodies, across all provinces and territories between July 2020- January 2022. Eighteen Regional Recruitment Coordinators distributed the survey to communities that have been under-represented in Canadian perinatal research. Those who experienced a pregnancy in Canada within 10 years of being invited to participate in the study were eligible. Full details of the methods for survey development and recruitment are published elsewhere (37,41). Ethics approval for the study was provided by the University of British Columbia Ethics Board (certificate ID H12-02418).

RESPCCT survey respondents articulated their experiences of perinatal care through 388 closed and open-ended items, across 17 domains of respect and disrespect during pregnancy, birth, and the postpartum period, including validated patient-reported experience measures that assess autonomy, respect and mistreatment (Clark et al., 2023; Vedam et al., 2017, 2018; Vedam et al., 2019). Socio-

demographic questions ensured that respondents could self-identify their race, parity, sexual orientation and gender identity, disability status during pregnancy, socio-economic status, and other health or social factors, life events, and need for services. Other items captured provider type, mode of birth, obstetric interventions, and details on the birth and postpartum experience. The survey took, on average, 60 minutes to complete, and was available in eight languages (Arabic, Chinese -simplified, Chinese -traditional, English, French, Inuktitut, Punjabi, and Spanish). A screen reader version of the survey was also available. Three distinct survey pathways collected information on current and past pregnancy experiences, as well as from those reporting on pregnancy loss. People from all provinces and territories (n=6096) participated.

Study Measures

Outcome Measure

Respondents completed the validated 7-item *My Autonomy in Decision Making (MADM) scale*, that assesses the level of agency that service users experience during discussions with their care provider about their options for care during pregnancy (42). Each MADM item has six response options that range from strongly disagree to strongly agree, with scores ranging from 7-42. Higher scores indicate a higher degree of autonomy. See Table 1 for the MADM items. The items were introduced as follows: *Please answer the following questions to describe your discussions with your doctor or midwife DURING PREGNANCY about your options for care (for example: prenatal testing, starting your labour, medications, caesarean, place of birth, newborn care, etc.).*

Prior to completing the scale, RESPCCT participants selected the type of healthcare provider (HCP) that they were rating, selecting family physician (FP), midwife (MW), obstetrician (OB), nurse

practitioner (NP) or 'not applicable; I did not have a doctor or midwife'. Each participant could report on their decision-making interactions with up to two different healthcare providers (HCP1 and HCP2), by completing the scale items more than once. The psychometric testing of the scale has been described in detail elsewhere (42). The tool has been translated into 21 languages and consistently shows high internal consistency reliability (17,45).

Exposure Measures

Exposure measures fall into three categories: 1) personal preferences, characteristics and circumstances (preferences for leading decisions, Indigeneity, race, gender and sexual identity, age, education, disability and relationship status, immigration history, income, number of social services needed during pregnancy, substance use during pregnancy, sense of belonging, and discrimination), 2) pregnancy factors (mental health treatment during pregnancy, pregnancy risk level, pre-pregnancy BMI) and 3) access to care (timely access to prenatal care and adequacy of prenatal visits, and access to preferred provider type and place of birth). We note that the 'Indigenous' variable for this analysis combines the three Indigenous groups in Canada—First Nations, Inuit, and Métis. See Supplementary File 1 for a description of variables that were included in the analysis

Why use a discrimination metric?

To examine inequities in autonomy experiences we included the 9-item Day-to-Day Discrimination index (46), a tool that was intentionally designed without attribution to specific social identities because of evidence that the harmful effects of experiences of discrimination are not tied to specific reasons for discrimination (47). Because the index applies across identities (sample item: *Because of who you are, have you been called names or heard/saw your identity used as an insult?*) it

is a suitable tool when analyzing several characteristics and life circumstances that might make pregnant people vulnerable to discrimination. We also included the tool because Adkins and others warn about the use of race and other identifiers as proxies for discrimination or racism (48,49). If we assume that a childbearing person experiences lower autonomy solely based on their identity, we can perpetuate stereotypes and undermine the strength-based approach that is emerging in public health research (48,49).

Discrimination scores range from 0-18. For the purpose of descriptive analysis and ease of interpretation the continuous discrimination score was recoded into three groups: no or low discrimination (below 50th percentile), moderate discrimination (51-75th percentile) and high discrimination (> 75th percentile).

Data analysis

For purposes of this analysis, we included RESPCCT respondents who completed all items of at least one version of the MADM scale. Participants who experienced a pregnancy loss were excluded from analysis. Experiences of autonomy and respect among those who reported a pregnancy loss are reported elsewhere (50). To enable analysis of all MADM scores the scores about the first and second health care provider were added in the same columns and an additional column was created to distinguish RESPCCT participants who provided one or two MADM scores.

To assess internal consistency reliability of the MADM scale in the RESPCCT study, we calculated Cronbach's alpha for each language version of the scale that had 10 or more completed responses. (see Supplementary file 2). When dividing the skewness and kurtosis statistics by their

standard errors we found that the results by far exceeded the minimum threshold for a normal distribution.

We report frequencies, proportions and median autonomy scores (and 5th and 95th percentiles) for each exposure. Median scores 2 or more points above or below the sample median are bolded in the tables. When reporting participant characteristics, the unit of analysis is the person and when reporting mean and median autonomy scores and multivariable findings the unit of analysis is the autonomy experience.

Multivariable modelling

Model 1 objective: To assess the association between autonomy and personal preferences, characteristics, circumstances, pregnancy factors and access to care, controlling for confounders.

To determine the magnitude of disparities in experiences of autonomy during pregnancy and statistical significance, we calculated incidence rate ratios, and 95th confidence intervals (95% CIs), derived from Negative Log Binomial models. The models included an estimation of the dispersion parameter (Maximum Likelihood Estimation, MLE), which was below 1 for all analyses. Confounders were controlled for by adjustment and stratification. We controlled for: year of pregnancy because temporal trends in this dataset indicated an increase in autonomy over the years of data collection (see Table 2); pregnancy number because the experiences of first time childbearing people can be different from those who have experienced pregnancy before; repeat observations (to account for response patterns among persons who submitted two MADM scores); and place of residence during pregnancy (because we observed lower autonomy scores among people from rural areas).

We stratified analyses by the type of provider participants reported on when completing the MADM scale (physicians versus midwives) because several studies from Canada and other countries show that midwife-led care is associated with higher MADM scores compared to physician led care (26,51–54). We created two groups: those reporting on 1) midwives (who scored 10 points or more than the other three providers) and 2) physicians (family physicians or obstetricians since their patients had similar MADM scores). Few people used the MADM items to describe interactions with nurse practitioners; and hence, these cases were excluded. Stratifying by midwife-led versus physician led models of care is a type of multilevel modelling (p. 42) that enables us to detect patterns of structural inequities (19). In other words, if groups experience lower autonomy across models of care, we can feel more certain that the mechanism for loss of autonomy might be rooted in structural inequities rather than other factors, such as lack of access to midwifery o care. We ran separate models for each exposure.

Model 2 objective: To stay true to our community-driven mandate to explore modifiable factors that might reduce disparities in autonomy experiences, we examined if 1) access to early prenatal care, 2) sufficient time during prenatal appointments, and access to 3) preferred healthcare provider and 4) place of birth as well as 5) model of care change experiences of autonomy during pregnancy for respondents who reported different levels of day-to-day discrimination. Access to care variables were included as exposures in model 1 and as moderators in model 2. Model of care (physician versus midwife-led) was included as a stratifier in model 1 and as a moderator in model 2.

In addition to testing each of the five conditions, we also summed the first four conditions to determine if the number of optimal access conditions moderates the relationship between discrimination and experiences of autonomy. This approach goes beyond looking at individual factors

in isolation and instead considers how their combined effects create unique experiences and opportunities for action.

Interaction terms

Day-to-Day Discrimination

We used the continuous discrimination score to construct interaction terms with the 5 hypothesized modifiers. The variables comprising the interaction terms were centered and the linear association between discrimination and autonomy was confirmed prior to analysis. Each linear regression model included the main effects and interaction term, as well as the four variables that were controlled for in model 1 (year of pregnancy, maternal residence, repeat observations and pregnancy order).

Experiences of Day-to-day Discrimination were significantly associated with all socio-demographic and pregnancy variables at $p < 0.001$. Specifically, the following groups were most likely to report high discrimination: RESPCCT participants who needed two or more social services during pregnancy (42.8 %), Indigenous and Black people (34.4 % and 31.1 % respectively), South Asian and Middle Eastern participants (20.0 % and 18.8 % respectively), participants who identified as a gender minority (34.6 %) or sexual minority (26.0 %), those reporting insufficient incomes to meet financial obligations (30.5 %), people reporting one or more disability during pregnancy (30.3 %), those with high school or less education (22.9 %), participants under the age of 25 (23.2 %), people who reported substance use during pregnancy (20.6 %), participants who required mental health treatment during pregnancy (18.7 %), people with a somewhat or very weak sense of belonging to their communities (18.0 %), people with BMI over 30 (17.4 %) or < 18.5 (16.6%), and people with high risk pregnancies (17.8 %).

RESULTS

Internal consistency of MADM scale in the RESPCCY Study

Internal consistency reliability of the different language versions of the MADM scale was high, ranging from 0.89-0.97 (see Supplemental Table 2). Most participants completed the English version of the scale (n=4828), and 478 completed the French version. We received 33 completed scales in Arabic, 12 in Spanish, 6 in Punjabi, 11 in simplified Chinese, 21 in traditional Chinese, and none in Inuktitut.

Sample

Among all RESPCCT study respondents (n=6096) 5389 people completed the scale items for HCP 1, and 1638 for HCP 2). In other words, 5389 participants submitted 7049 MADM scale scores. The mean MADM score was 28.6 (standard deviation (SD) = 10.7, variance=114) and the median 31 (5^{th}, 95^{th} percentile: 8, 42) (skewness = - 0.49, kurtosis = - 0.93). Large increases in scores over time were observed for those who completed MADM in reference to physicians (obstetricians and family physicians). Scores for midwifery clients stayed the same (39.0 both in 2010 and in 2020)(see Figure 1). Almost all (95.0%) who completed MADM-HCP 1 reported on the HCP type who was leading their pregnancy care. Participant characteristics are described in Table 2.

Median autonomy scores

Respondents with the following characteristics reported scores 2 or more points **below** the median MADM score: those who self-identified as Indigenous to Canada, or as Middle Eastern, who belonged to a gender minority group, people without a university degree, with a disability, single parents, younger participants (< 25 years), and newcomers to Canada. Participants who resided in a

rural area at the time of their pregnancy reported lower autonomy scores as did participants who were pregnant between 2009 and 2013. Childbearing people with advanced academic degrees, those residing in large cities, people who identified as Latine or Hispanic, participants who immigrated to Canada between 4-6 years ago, and those aged 35 or older reported autonomy scores 2 or more points **above** the sample median (see Table 2).

Several life circumstances and pregnancy factors were associated with at least 2 scores above or below the median MADM score (see Tables 2 & 3). People who needed two or more social services during pregnancy, those who reported mental health treatment during pregnancy, people with a BMI > 18.5 or 40 or higher, those who did not earn enough to cover their monthly financial obligations, participants who reported high day-to-day discrimination and people who felt a weak sense of belonging to their communities had autonomy scores at least two points lower than the sample median. Conversely, financial stability, low pregnancy risk and a 'somewhat' or 'very strong' sense of belonging were linked to higher autonomy scores. Autonomy scores did not vary much, depending on participants preferences for leading decisions, whether they reported on a first, second, third or higher order pregnancy and whether they used substances during pregnancy or not.

Mutivariable findings

Model 1

All analyses in this section are stratified by the type of healthcare provider whom people reported on, and controlled for pregnancy year, pregnancy order, place of residence, and repeat observations.

Although we observed variations in autonomy scores by ethnoracial identity in the descriptive analysis, in adjusted models there were no significant differences.

Leading decisions: Notably, in the RESPCCT study, 87.8 % of respondents said it was extremely important or very important to lead decisions about their pregnancy, birth, and/or baby care. Autonomy scores did not vary by preferences to lead decisions about care for those who reported on midwife-led care . However, participants who rated physician-led care models and who felt it was extremely important to lead decisions about their care had significantly lower autonomy scores (19% lower), compared to those for whom leading decisions was not important.

Sociodemographic characteristics: Childbearing people who identified as heterosexual and cisgender had significantly higher autonomy scores compared to people minoritized on the basis of sexual orientations or gender identity. For example, cisgender women had 8% higher autonomy scores compared to gender minoritized people who reported on midwife-led care. Heterosexual participants who reported on physician-led care had 10% higher autonomy course and those reporting on midwife led care model 3 % higher scores compared to those who identified as a sexual minority group.

Age less than 25 at the time of pregnancy was linked to a 13 % lower autonomy scores compared to those 35 and over among those reporting on interactions with physicians. Being single versus partnered was linked to a 10% decrease in autonomy scores among midwifery clients. RESPCCT participants with lower educational attainment (high school or less) reported significantly lower autonomy scores irrespective of whether they had midwife-led or physician-led care. RESPCCT participants who reported on physician-led care and who had ‘enough’ or ‘more than enough’ income to cover financial obligations reported autonomy scores that were 9 % and 18 % higher than those with

413 insufficient income. Among those reporting on physician-led care , there was an incremental loss of
414 autonomy as the level of education decreased (Table 2).

415 *Social, systemic, and health factors*

416 Several life circumstances and pregnancy factors were associated with MADM scores. Childbearing
417 people cared by either midwives or physicians and who were not reliant on social services had a 11% -
418 13% increase in autonomy scores compared to those who needed 2 or more social services. Among
419 people reporting on midwife-led care, those without mental health conditions requiring treatment
420 during pregnancy had scores that were 10 % higher compared to those reporting mental health issues.

421 Newcomers to Canada reporting on interactions with midwives reported an 11% decrease in autonomy
422 compared to those who had immigrated more than six years ago. Participants with a strong sense of
423 belonging had significantly higher autonomy scores. The discrepancy was especially pronounced
424 among those reporting on their interaction with physicians: Those with a very strong sense of
425 belonging had autonomy scores that were 26% higher compared to those with a very weak sense of
426 belonging. Participants who reported 'no or low' levels of discrimination had 21% higher autonomy
427 scores when under physician-led care and 6% higher scores when care for by midwives, compared to
428 childbearing people who reported high discrimination (Table 2).

429 Pregnancy BMI showed no significant associations in the multivariable analysis (Table 3). Participants
430 who did not have a disability during pregnancy had autonomy scores that were 7% higher among those
431 reporting on physicians and 4 5 higher among those reporting on midwives compared to people with
432 one or more disabilities during pregnancy. Participants reporting on midwives who were told they
433 were high risk during pregnancy had significantly lower autonomy scores.

Access to care

Several 'access to care' variables were associated with large variations in autonomy scores: Those who answered *no* to the question '*Did you get prenatal care as early as you liked?*' reported a median score of 24 compared to 33 among respondents who answered yes to the question (and a 4 % decrease in autonomy scores when reporting on midwives and 19% decrease when reporting on physicians). Autonomy scores were related to length of prenatal visits in a linear fashion, with autonomy scores increasing as levels of agreement with the statement *I felt that I had enough time during prenatal visits* increased. Participants who strongly disagreed with the statement had a median MADM score of 14 compared to a score of 38 among those who strongly agreed that they had enough time during prenatal visits.

Participants who were *easily able to find their preferred type of prenatal provider (family physician, midwife or obstetrician)* had a median score of 33 compared to 21 among those who could not find their preferred provider type. Not having access to their preferred provider was linked to a 27 % decrease in autonomy scores among those reporting on physicians and a 6 % decrease among those describing interactions with midwives. Participants who were able to choose their preferred place of birth also reported much higher autonomy scores than those who did not have a choice (34 versus 23). Not having access to their preferred place of birth was associated with a 12% decrease in autonomy scores among those reporting on interactions with midwives and a 28% decrease among those with physicians (see Table 4).

Model 2

We tested five potential moderators: *I got prenatal care as early as I liked* (no/yes) (p= 0.414), *I felt that I had enough time during prenatal visits* (disagree/agree) (p=0.534), *I was easily able to find my preferred type of prenatal provider (no/yes)* (p=0.936*), I was able to choose my preferred place of birth (no/yes)* (p=0.225), sum of Optimal Access Conditions (i.e. adding up the four conditions: None or one, two, three or four (p=0.614) and model of care (p=0.009). Model of care (midwife versus physician-led care) as the only significant moderator, providing evidence that midwifery care was linked to increases in autonomy for marginalized people (Figures 2).

DISCUSSION

This is the first national study in Canada to examine service user's agency in decision-making during pregnancy, using a person-centred measure, across a broad cross-section of the childbearing population. Strengths of the study include the large and diverse sample of underrepresented service users, the application of validated patient reported experience measures, the community driven approach to data collection, analysis and interpretation, and our ability to compare our findings with other studies that used the same measure of autonomy. While the large majority of respondents preferred to lead decisions about their pregnancy care, there were significant disparities in their ability to exercise autonomy by socio-demographic characteristics, life circumstances, and pregnancy factors. In a healthcare system where people are treated the same irrespective of their social identities and circumstances, we would expect to find no differences in autonomy experiences. The fact that these differences were observed irrespective of which prenatal care provider people rated points to structural inequities that transcend different models of prenatal care in Canadian maternity care.

In the adjusted models, we found increased autonomy among people with more privileged social identities. Ethnoracial identity overlapped significantly with experiences of discrimination, but on its own was not a factor associated with autonomy. Similarly, in a United States (US) study from 2022 (n=1711), the median MADM score for white participants was 34 and the score for IBPOC (Indigenous, Black and Persons of Colour) respondents was 33 (55). In the study from British Columbia that introduced the MADM Scale, childbearing people who reported being treated poorly because of their race or ethnicity had 46% lower autonomy scores whereas identifying as a person of colour was not linked to differences in autonomy (26). These findings underline the importance of not using race as a proxy for racism (48) and demonstrate the value of incorporating tools that measure racism and discrimination directly, such as the Day-to-Day discrimination index (46).

Indicators of socio-economic standing (such as the ability to meet financial obligations, education, and need for social services during pregnancy) and low sense of belonging were strongly associated with autonomy in the multivariable models. The link between financial difficulties, lack of support from friends and family and lower MADM scores has been documented by others (45,52). As in the current study, MADM scores were significantly lower among women with pregnancy complications in a study from Iceland (unadjusted analysis) (45). Similarly, one qualitative study from Switzerland showed that perinatal providers were less likely to support autonomy when complications arise (56).

We found evidence that participants who expected to lead decisions and were reporting on physicians had much lower autonomy scores; it is likely that there was a mismatch between expectations and lived experiences of care by physician patients, a finding that was also reported by Vedam et al (2017).

494 In that study dissatisfaction with decision-making was linked to very low MADM scores (median of 14)
495 among participants who said it was important or very important to lead decisions about their care (42).

496 Autonomy scores varied moderately by personal characteristics (like age, education, ethnoracial
497 identity) and life circumstances (need for social services), and quite substantially by model of care and
498 access to preferred care options. While addressing structural inequities requires multisectoral, long-
499 term engagement, our analysis elicited several instructive findings on facilitators to experiencing
500 autonomy, including modifiable factors, such as model of care, adequacy of time during prenatal
501 appointments and timeframe of onset of prenatal care. We identified which of these health system
502 factors were most likely to close the gap in autonomy experiences for marginalized childbearing
503 people.

504 A*ccess to preferred provider and place of birth*

505 In the current study, access to their preferred provider was linked to higher MADM scores
506 among childbearing people. Likewise, women who received care from a chosen physician or midwife in
507 Hungary reported a median score of 27 and 31 compared to a score of 21 among those who did not
508 have access to a chosen provider (57). There are many reasons why pregnant people might not be able
509 to access their preferred provider, including limited access to midwives and obstetricians in rural areas.
510 Structural barriers to accessing midwives for racialized and minoritized persons have also been
511 reported (58–61).

512 Place of birth was conceptualized in this study as birth in a hospital, home or birthing centre within
513 their local community. Access to preferred provider and preferred place of birth are closely related as
514 midwives are the only providers offering choice of birthplace in Canada. For childbearing people who

prefer community settings for birth, lack of access to midwifery care means that they cannot give birth at home or in a birthing centre. Future studies ought to assess whether childbearing people were able to birth in the community of their choice. In Canada, movements to "bring birth back home" refer to childbearing people being able to give birth close to home, and reclaiming Indigenous birthing practices within rural and remote communities, by integrating Indigenous birth ceremonies into clinical care and training local Indigenous doulas to support people in labour, among other strategies. Such initiatives are aligned with both the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) and the Sustainable Development Goals (SDGs) (62).

Model of care

MADM scores among those reporting on interactions with midwives were more than 10 points higher than other HCP types, a finding that is supported by several studies that examined MADM scores across healthcare provider groups (16,26,42,51,52,57,63). In the current study, Indigenous and BPOC respondents were the least likely to report access to midwifery care:23.8 % of Indigenous people and 15.0 % of Middle eastern participants reported prenatal midwifery care, compared to 37.4 % of Asian, 36.6 % of Latine/ Hispanic and 38.9 % of white participants. Other groups with notably lower rates of access to midwifery care were: those 25 and younger, people with lower educational attainment, single parents and people in need of social services (see Table 5).

Time to consider and understand options for care

The current study highlights that enough time during prenatal visits is crucial for exercising autonomy as the data showed an 18-point difference between participants who strongly disagreed versus agreed that they had enough time during prenatal visits (Table 3). This finding is supported by

research from BC, using the same scale to measure autonomy. Childbearing persons from BC who held back questions during prenatal appointments because their provider seemed rushed reported significantly lower MADM scores (43). In addition, participants from BC with prenatal appointments less than 15 minutes reported median MADM scores of 23 compared to 36 for those with appointments lasting between 16-30 minutes. The highest MADM scores were reported for people with appointment lasting more than 30 minutes (42). When stratifying results by prenatal care provider, midwifery clients with short appointments reported higher autonomy scores when compared to physician clients with short appointments, suggesting that time alone does not explain pregnant people's perceptions of autonomy (42). Research from outside Canada also supports the link between choice and length of time. In one study of audio-recorded discussions between women and their perinatal providers in the UK, the authors recorded 194 patients who spoke with 15 physicians during pregnancy and arrived at 585 decisions. The study found that none of the patient variables (age, gestation in weeks, and level of deprivation) were associated with 'decisions with choice' but longer consultations were associated with more 'decisions with choice' (64).

IMPLICATIONS FOR PRACTICE AND POLICY: CLOSING THE EQUITY GAP

This is the first national study, using patient-reported experience measures, to show that disparities in autonomy exist in Canada, and that they can be reduced by increasing access to: early prenatal care, sufficient time during prenatal appointments and preferred provider type and place of birth. In addition, midwifery care was linked to higher autonomy scores among marginalized perinatal service users.

Ethical responsibility and gaps in ensuring patient autonomy in perinatal services

Undoubtedly health professional curricula, both pre-service and in-service must mandate annual and continuous education on sources of disparities in outcomes (such as institutional and interpersonal racism, ableism and discrimination), and its impact on uptake of and access to care options. Addressing anti-Indigenous racism and associated disparities in perinatal outcomes and experience (21) is a public health priority and integral to meeting the Truth and Reconciliation Calls to action.

The Canadian Medical Association Code of Ethics (65) asks physicians to 'empower the patient to make informed decisions regarding their health by communicating with and helping the patient navigate reasonable therapeutic options to determine the best course of action consistent with their goals of care' (p. 5) and to 'respect the decisions of the competent patient to accept or reject any recommended assessment, treatment, or plan of care (p.5). Registered midwives in Canada must provide each client with information regarding relevant treatments, procedures, tests and medications throughout their care (66). The British Columbia College of Nurses & Midwives (BCCNM) Informed Choice Policy delineates the types of information that all midwives are expected to provide: "what is being proposed/offered and its risks/benefits; any alternatives to what is being proposed/offered and their risks/benefits; what would happen if no treatment/procedure/test/medication is chosen; relevant research evidence including any deficiency of clear evidence; and relevant community standards of care and practices. The midwife must also make reasonable efforts to ensure that the client has adequate opportunity and time to engage in the informed choice process." (67)(Page1). However, despite clear standards to empower service users to make decisions about their care, a chasm between guidelines and reality exists and myriad system- and individual level factors influence whether, how much, and for whom autonomy is enabled. Fortunately, our findings that autonomy

scores are improving over time (see Figure 1), especially for physicians suggests that public and health professional education around person-centred decision making and self-determination is improving.

Barriers & Facilitators to enabling autonomy in decision-making during pregnancy

Decision-making in birth is complex and influenced by bioethical considerations, institutional factors, and personal attitudes of providers. There is a significant body of literature that shows that HCP attitudes link closely to service user's choices (68–70).

HCPs in Switzerland questioned the decision-making capacity of birthing people because of pain, fears, or lack of medical knowledge and felt that the reason for lack of autonomy is due to factors beyond their control (56). In a second publication based on interviews with 15 perinatal providers Rost et al. (71) describe factors that advance and limit autonomy: Facilitators included: building trust during antenatal appointments, healthcare provides using tools to improve communication and giving women time to decide, and postnatal debriefing to help prevent postnatal psychological problems. Limiting factors were: Barriers encountered by the birthing person, including limited knowledge about reproductive rights, limited birth preparation, or decisional capacity. Other barriers to autonomy that emerged during interviews were conflicts among practitioners due to different perspectives about autonomy, lack of continuity of care which weakens trust and impairs communication, and structural barriers such as resource limitations, hospital guidelines, hierarchy, and health politics that may override personal choices of birthing people (71).

Even well-intentioned attempts to offer choices can negatively impact reproductive autonomy and informed decision-making (72). Globally, studies have found that counselling of parents about prenatal screening and testing is often biased and does not give parents all of the information they need in

599 order to make an informed decision (72–79). For example, in Sangster and Lawson's qualitative study,
600 participants described experiences that threatened their ability to make informed decision about
601 prenatal testing for Down Syndrome: routinization of screening (i.e. being screened without offering it
602 as a choice and HCP not explaining that screening is optional); HCPs equating an openness to screening
603 with an openness to testing and termination; and misunderstanding and miscommunicating about the
604 probability of different outcomes.

605 Whether childbearing people are presented with complete information about their options depends
606 on the willingness, comfort and skills of health care providers. Patients may also be influenced by a
607 larger public discourse on normative choice and community standards, or the HCP may be introducing
608 bias into informed consent discussions. The presentation of options for obstetric procedures like
609 induction of labour or trial of labour after cesarean have been shown to be influenced by predictive
610 risk models that automate racism into decision making discussions (80,81).

611 Research from Europe shows that childbearing people have trouble understanding the concept of
612 autonomy in decision-making, because they were not offered any choices during pregnancy (82).
613 Similarly, the UK study where discussions with women and their HCPs were audio taped and analyzed
614 found that in 75% of consultations no actual choice was offered, leading authors to conclude that more
615 research is needed to understand which choices are available to pregnant people and how to better
616 support HCPs in offering choices (64).

617 Finally, in our previous national and provincial studies, set in North America, over 50% of service users
618 declined some test or procedure (4,6). While white people and people of colour in the US declined care
619 at the same rate, HCPs were more likely to accept and support the decision of white service users

620 whereas people of colour were more likely to experience loss of autonomy because the test or
621 procedure they declined was done against their will or they were pressured into accepting the provider
622 recommendation (7).

623 These findings highlight that HCPs need to be prepared to explain the concept of autonomy to
624 pregnant women at the first prenatal appointment, and can expect some to decline their
625 recommendations. How HCPs react in these situations influences the pregnancy and birth experience
626 of service users, ranging from very positive experiences where service users felt well supported to very
627 negative experiences, including psychological trauma (4,6).

628 See Box 1 for recommendations to improve autonomy in decision-making.

629 *Limitations and Future Research*

630 In this paper, we use the term Indigenous to describe the three distinct Indigenous groups in Canada—
631 First Nations, Inuit, and Métis—each have unique cultures, languages, and histories shaped by their
632 specific relationships to the land and the impacts of colonization, making it essential to recognize these
633 differences to address their unique needs, policies and rights effectively. However, the small sample
634 size would not allow for a nation-specific analysis.

635 Options for care that are available to pregnant people depend on many system-level and individual
636 factors, including geography, political climate, health status and knowledge of the pregnant person and
637 the experience and comfort of HCPs. In the current study we measured some but not all these factors.
638 Additional unmeasured factors that might influence perceptions of autonomy include patients' health
639 literacy and capacity to engage in decision making; pre-existing cultural expectations about the rights

to choice; HCP training on how to facilitate informed choice; the gender of prenatal providers, which has been shown to affect service user – HCP communication (83); and continuity of care.

In Canada only models involving midwives and family physicians are designed to provide continuity of care. In the current study, family physicians were grouped with obstetricians for some of the analyses, because they had similar MADM scores. Future studies ought to examine the relationship between autonomy and specific aspects of care such as continuity of care, which was linked to higher MADM scores in a study from Australia (7,13).

The current study focused on autonomy during pregnancy. Authors who have asked women to complete the MADM scale in reference to different time points found that the gap in autonomy scores between midwifery and physician patients was largest when assessing autonomy during labour and birth (54), and that MADM scores were lower among childbearing people who experienced pregnancy complications, induction of labour and Cesarean birth (45). Future studies are needed that disentangle the complex relationship between autonomy, the HCP who led care during birth, maternal complications, place of birth, and mode of birth. Results from the current study should not be generalized beyond the Canadian setting.

Conclusion

We found that disparities in experiences in autonomy were linked to several marginalized sociodemographic identities and circumstances, after controlling for confounders. We identified several modifiable factors that seem to promote autonomy in pregnancy, including midwifery care, early entry into prenatal care, and the ability of pregnant people to access their preferred provider and place of birth. Our findings draw attention to the importance of having enough time to support

informed decision-making across models of care, expansion of access to midwifery care among marginalized service users as well as universal attention to conversations between HCPs and pregnant people about their preferences and expectations for leading decisions.

These factors should be seen as reproductive rights, alongside the right to make autonomous decisions during pregnancy, birth and the postpartum period. To date, the discourse about reproductive autonomy has been narrowly focused on controlling, assisting with and avoiding reproduction (e.g. forced sterilization, fertility services and abortion) and needs to be expanded to include all perinatal decisions and experiences (84,85). Doing so will likely improve health outcomes and experiences of all perinatal service users.

Words: 7134

Box 1: Recommendations to improve autonomy in decision-making

EDUCATION

1. Enhance curricula to support development of person centred decision-making competencies across perinatal health professions.
2. Mandate regular interprofessional training about how to support person centred decision-making at hospital.
3. Offer post-secondary training programs as well as continuing professional development opportunities on the topic of diversity, disparities, disability, trauma informed care, indigenous cultural safety and respectful care.
4. Inform pregnant people of their rights and the remedies available to them if their rights are not respected.

PRACTISE

1. Clarify early on during pregnancy whether people want to lead decisions about the care, whether they want HCPs to lead decisions or whether they prefer shared decision making. Communicate exceptions to person-led decision making (if there are any) and take time to understand the needs and preferences of clients. Inform them that it is possible to make decisions, and encourage them to do so. Check their willingness to participate in decisions.
2. Give pregnant people enough time to decide by introducing options for care over time and revisiting decisions after they had time to consider their options.
3. Support healthcare providers to conduct informed consent discussions in lay language, with the assistance of ESL resources for patients with low health literacy, and new immigrants. Lay language and visuals are also helpful for persons with learning disabilities. Attend to physical positioning during conversations and body language.
4. Increase access to language interpreters for medical care including access to Sign Language interpreters.
5. Encourage healthcare providers to inquire about whether people who enter care found their preferred type of provider. If the answer is no be aware that perceptions of autonomy might be different as a result and more effort might be required to close the gap.

HEALTH SYSTEM/HOSPITALS

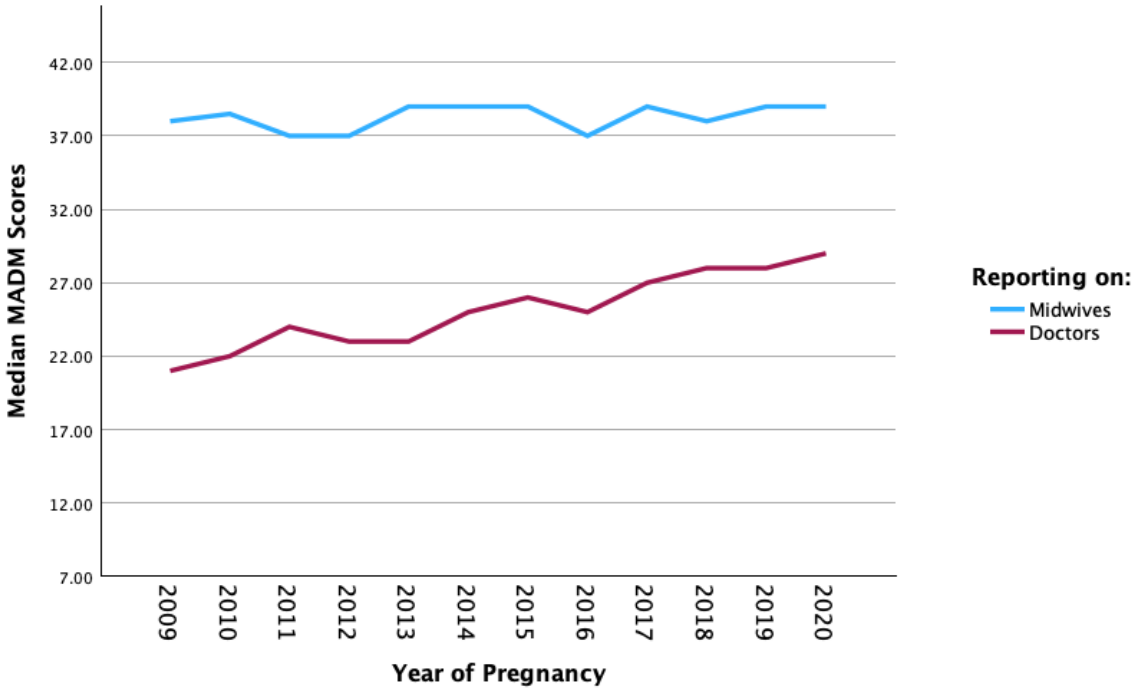
1. Create clinic processes, staffing models, physical spaces and program budgets that adequately support the dedicated time needed to provide respectful, relationship-based care.
2. Support health systems expansion of culture centered care via Indigenous midwives, (e.g. reserved privileging spots for Indigenous midwives, Salaried positions etc.) For Indigenous people, efforts are needed to honor the right to ceremony and rituals surrounding pregnancy and birth and to incorporate biomedical interventions only when necessary. Birth ceremonies are directly connected to the land, so recognizing the importance of birthplace (geographical location) and honoring the sacredness of birth is a significant way to recognize and implement Indigenous rights (62).

3. As part of continuous quality improvement, routinely measure the experience of decision-making during pregnancy and birth as an important indicator of quality perinatal care (see examples here: https://www.birthplacelab.org/measures-and-metrics/). Develop strategies, to improve care for groups who report worse perinatal experiences, in collaboration with service users and evaluate these strategies.
4. Provide training, policies and tools to help health care providers intervene when they see a colleague providing care that does not support autonomy, respect or safe care.
5. Facilities and/or health authorities need to offer mechanisms for childbearing people to submit reports of rights violations during birth and be transparent about mechanisms for re-dress.
6. Identify independent bodies to lead full and fair investigations into allegations of loss of autonomy and mistreatment during pregnancy and childbirth Ensure that victims of rights violations are provided accountability and remedies by both government, regulatory bodies, facility, and/or non-state actors.
7. Expand awareness of healthcare rights and expand care options. In theory, perinatal service users should have the right to choose their place of birth, or HCP. This implies the right to be informed about and have access to their preferred and culturally responsive model of care (eg. water birth, nonpharmacologic pain relief, different birth settings, including home and birth centers, midwife-led care, or presence of family, Elders and ceremony). The fact that these rights are not universal reflects structural barriers.

Table 1: My Autonomy in Decision-Making (MADM) Scale Items

1	My provider asked me how involved in decision making I wanted to be.
2	My provider told me that there are different options for my maternity care.
3	My provider explained the advantages/disadvantages of the maternity care options.
4	My provider helped me understand all the information.
5	I was given enough time to thoroughly consider the different care options.
6	I was able to choose what I considered to be the best care options.
7	My provider respected my choices.

Figure 1: Temporal changes in autonomy score, by health care provider type (n=5295)



Excludes Nurse Practitioners, Other providers and pregnancy year 2021 because there were fewer than 100 responses.

Table 2: Respondent characteristics and autonomy scores

	Unit of analysis is person (n=5389)	Unit of analysis is MADM score (n=7049)		
	n (%)	Median MADM score (5th & 95th percentiles)	Incident rate ratios (95% CIs) Reporting on physicians	Incident rate ratios (95% CIs) Reporting on midwives
PREFERENCES FOR LEADING DECISIONS				
How important is it to you to lead the decisions about your pregnancy, birth and/or baby care?				
Extremely important	3075 (57.2)	31 (7,42)	**0.81 (0.74-0.90)**	1.06 (0.92-1.23)
Very important	1646 (30.6)	31 (11,42)	0.92 (0.83-1.01)	1.06 (0.92-1.23)
Moderately important	559 (10.4)	30 (12,42)	0.93 (0.84-1.03)	1.01 (0.87-1.18)
Slightly or not at all important	99 (1.8)	30.5 (11,42)	Reference	Reference
SOCIO-DEMOGRAPHIC CHARACTERISTICS				
Race/ethnicity				
Indigenous	288 (6.5)	**29** (7,42)	0.98 (0.93-1.04)	0.97 (0.92-1.01)

Black	139 (3.1)	30 (7,42)	0.97 (0.89-1.05)	0.99 (0.92-1.06)
Middle Eastern	100 (2.3)	**27** (8,42)	0.98 (0.89-1.07)	0.96 (0.86-1.06)
South Asian	91 (2.1)	31.5 (8,42)	0.97 (0.88-1.09)	0.96 (0.90-1.03)
East Asian	156 (3.5)	32 (11,42)	1.04 (0.96-1.13)	0.97 (0.92-1.03)
Latine or Hispanic	101 (2.3)	**33** (10,42)	1.03 (0.93-1.13)	0.99 (0.93-1.07)
Other	80 (1.8)	32.5 (10,42)	0.98 (0.89-1.09)	1.00 (0.93-1.08)
White	3469 (78.4)	32 (8,42)	Reference	Reference
Gender identity				
Cis Gender	4152 (97.3)	31 (8,42)	1.09 (0.99-1.19)	**1.08 (1.01-1.16)**
Gender minority	115 (2.7)	**28** (8,42)	Reference	Reference
Sexual identity				
Heterosexual	3679 (85.4)	31 (9,42)	**1.10 (1.06-1.15)**	**1.03 (1.01-1.06)**
Sexual minority	630 (14.6)	30 (7,42)	Reference	Reference
Age at start of pregnancy				
< 25 years	478 (10.8)	**26** (7,42)	**0.87 (0.82-0.92)**	0.98 (0.94-1.03)
25-34	2996 (67.6)	32 (8,42)	0.96 (0.93-1.00)	1.02 (0.99-1.04)
35 and over	959 (21.6)	32 (10,42)	Reference	

Education				
Some high school or high school completed	315 (7.5)	**26** (7,42)	**0.86 (0.82-0.92)**	**0.93 (0.88-0.98)**
Some college or apprenticeship completed	999 (23.7)	**29** (7,42)	**0.91 (0.87-0.95)**	0.99 (0.96-1.02)
Undergraduate degree	1425 (33.7)	32 (9,42)	**0.96 (0.93-0.99)**	1.01 (0.98-1.03)
Grad degree/professional degree	1485 (35.2)	**33** (9,42)	Reference	Reference
Disability during pregnancy				
No	3959 (92.2)	32 (8,42)	**1.07 (1.02-1.13)**	**1.04 (1.00-1.09)**
Yes	333 (7.8)	**27** (7,42)	Reference	Reference
Relationship status				
Single	121 (2.8)	**28** (7,42)	1.04 (0.96-1.13)	**0.90 (0.82-0.98)**
Married or partnered	4211 (97.2)	31 (8,42)	Reference	Reference
Immigration history				
Born in Canada	2921 (66.1)	31 (8,42)	**0.97 (0.93-0.99)**	1.02 (0.99-1.04)
Immigrated within 3 years	195 (4.4)	**28** (7,42)	0.95 (0.88-1.02)	**0.89 (0.84-0.95)**
Immigrated within 4-6 years	132 (3.0)	**33** (9,42)	0.97 (0.88-1.06)	1.01 (0.95-1.07)
Immigrated > 6 years ago	1170 (26.5)	32 (9,42)	Reference	Reference

Substance use during pregnancy				
No	3979 (95.6)	31 (8,42)	1.04 (0.97-1.11)	1.00 (0.95-1.06)
Yes	181 (4.4)	30 (7,42)	Reference	Reference
Ability to meet financial obligations				
Income more than enough	2210 (51.7)	**33** (9,42)	**1.18 (1.11-1.24)**	1.03 (0.99-1.08)
Income Enough	1724 (40.3)	**29** (8,42)	**1.09 (1.03-1.15)**	0.98 (0.94-1.03)
Income not enough	340 (8.0)	**27** (7,42)	Reference	Reference
# of social services needed during pregnancy				
None	2809 (80.4)	32 (8,42)	**1.11 (1.04-1.19)**	**1.13 (1.06-1.21)**
1	501 (14.3)	30 (7,42)	1.05 (0.97-1.13)	**1.08 (1.00-1.16)**
2 or more	185 (5.3)	**25** (7,41)	Reference	Reference
Sense of belonging to community				
Very strong	564 (17.2)	**34** (10,42)	**1.26 (1.04-1.53)**	**1.09 (1.03-1.15)**
Somewhat strong	1572 (48.1)	**33** (10,42)	**1.19 (1.00-1.41)**	**1.09 (1.05-1.15)**
Somewhat weak	808 (24.7)	30 (8,42)	1.10 (0.93-1.31)	1.04 (0.99-1.10)
Very weak	326 (10.0)	**22** (7,42)	Reference	Reference

Day-to-day discrimination				
None/Low (scores of 0-2)	2880 (70.8)	32 (9,42)	**1.21 (1.15-1.26)**	**1.06 (1.02-1.11)**
Moderate (scores of 3-6)	734 (18.1)	30 (8,42)	**1.14 (1.08-1.21)**	1.02 (0.97-1.06)
High (scores > 7)	451 (11.1)	**25** (7,42)	Reference	Reference
PLACE & TIME				
Place of residence during pregnancy				
Rural area (less than 1,000 people).	272 (6.4)	**29** (8,42)	Controlled for in models (adjustment)	
Small town (b/w 1,000 and 29,999 people).	794 (18.7)	30 (8,42)		
Medium-sized city (b/w 30,000 and 99,999 ppl).	540 (12.7)	30 (7,42)		
City (more than 100,000 to 499,999 ppl).	1120 (26.4)	31 (9,42)		
Big City (more than 500,000 ppl).	1520 (35.8)	**33** (8,42)		
Year of pregnancy				
2009	101 (1.9)	**27** (7,42)	Controlled for in models (adjustment)	
2010	233 (4.3)	**27** (7,42)		
2011	277 (5.2)	**29** (7,42)		
2012	270 (5.0)	**27** (7,42)		
2013	290 (5.4)	**29** (8,42)		

2014	367 (6.8)	31 (7,42)		
2015	450 (8.4)	31 (8,42)		
2016	489 (9.1)	30 (8,42)		
2017	607 (11.3)	31 (9,42)		
2018	806 (15.0)	32 (9,42)		
2019	929 (17.3)	32 (10,42)		
2020	480 (8.9.)	32 (12,42)		
2021	69 (1.3)	32.5 (12,42)		

Median scores that are at least two scores below the sample median of 31 are bolded in red and those at least two scores above the sample median are bolded in green.

Results are based on Negative Log Binomial models, with estimation of dispersion parameter (MLE). Model controls for year of pregnancy, repeat observations (i.e. persons who submitted two MADM scores), place of residence during pregnancy (5 categories, from rural/remote to urban) and the pregnancy reported on (first, second, third or fourth or higher).

Table 3: Association between pregnancy factors and autonomy scores

		Unit of analysis is person (n=5389)	Unit of analysis is MADM score (n=7049)	
PREGNANCY	n (%)	Median MADM score (5^{th} & 95^{th} percentiles)	Incident rate ratios (95% CIs) Reporting on physicians	Incident rate ratios (95% CIs) Reporting on midwives
Required mental health treatment during pregnancy				
No	4747 (89.6)	31 (8,42)	1.04 (0.99-1.09)	**1.10 (1.06-1.15)**
Yes	549 (10.4)	**29** (7,42)	Reference	Reference
Was told pregnancy is high risk				
No	4336 (80.5)	32 (8,42)	1.00 (0.97-1.04)	**1.06 (1.03-1.10)**
Yes	1053 (19.5)	**28** (7,42)	Reference	Reference
Pre-pregnancy Body Mass Index (BMI)				
< 18.5	155 (3.7)	**29** (7,42)	1.02 (0.92-1.13)	1.01 (0.92-1.11)
18.5-24.9	2151 (51.2)	32 (9,42)	1.06 (0.99-1.14)	1.08 (0.99-1.16)
25.0-29.9	1039 (24.7)	31 (9,42)	1.04 (0.96-1.12)	1.06 (0.98-1.15)

30-34.9	492 (11.7)	30 (7,42)	1.04 (0.96-1.13)	1.05 (0.97-1.15)
35-39.9	214 (5.1)	30 (8,42)	1.06 (0.97-1.16)	1.03 (0.94-1.14)
40 and over	149 (3.5)	**27** (7,42)	Reference	Reference
Participant reported on			Controlled for in models (adjustment)	
First pregnancy	3027 (56.2)	30 (8,42)		
Second Pregnancy	1375 (25.5)	32 (9,42)		
Third pregnancy	626 (11.6)	32 (9,42)		
Fourth or higher	354 (6.6)	31 (7,42)		
Health Care Provider that MADM was completed in reference to			Controlled for in models (stratification)	
Midwife	1909 (35.6)	**38** (17,42)		
Family Physician	1215 (22.6)	**28** (9,42)		
Obstetrician	2171 (40.4)	**25** (7,41)		
Nurse Practitioner	74 (1.4)	**25** (7,41)		

Median scores that are at least two scores below the sample median of 31 are bolded in red and those at least two scores above the sample median are bolded in green.

Results are based on Negative Log Binomial models, with estimation of dispersion parameter (MLE). Model controls for year of pregnancy, repeat observations (i.e.persons who submitted two MADM scores), place of residence during pregnancy (5 categories, from rural/remote to urban) and the pregnancy reported on (first, second, third or fourth or higher).

Table 4: Association between access to care and autonomy scores

	Unit of analysis is person (n=5389)	Unit of analysis is MADM score (n=7049)		
Access to care	n (%)	Median MADM score (5^{th} & 95^{th} percentiles)	Incident rate ratios (95% CIs) Reporting on physicians	Incident rate ratios (95% CIs) Reporting on midwives
Did you get prenatal care as early as you liked?				
No	739 (13.7)	**24** (7,42)	**0.81 (0.78-0.84)**	**0.96 (0.93-0.99)**
Yes	4644 (86.3)	32 (9,42)	Reference	Reference
I felt that I had enough time during prenatal visits.				
Strongly disagree	347 (6.9)	**14** (7,38)	**0.50 (0.47-0.53)**	**0.62 (0.58-0.67)**
Disagree	351 (7.0)	**19** (8,39)	**0.66 (0.63-0.70)**	**0.74 (0.70-0.79)**
Somewhat disagree	389 (7.8)	**24** (10,39)	**0.76 (0.72-0.80)**	**0.85 (0.79-0.90)**

Somewhat agree	634 (12.7)	**26** (9,41)	**0.81 (0.78-0.84)**	**0.83 (0.79-0.86)**
Agree	1511 (30.2)	32 (11,41)	**0.91 (0.87-0.94)**	**0.89 (0.87-0.91)**
Strongly agree	1777 (35.5)	**38** (12,42)	Reference	Reference
I was easily able to find my preferred type of prenatal provider (family physician, midwife or obstetrician).				
No	1083 (20.1)	**21** (7,42)	**0.73 (0.71-0.75)**	**0.94 (0.91-0.98)**
Yes	4306 (79.9)	**33** (10,42)	Reference	Reference
I was able to choose my preferred place of birth (home, hospital, or, where available, birthing centre).				
No	1509 (28.0)	**23** (7,41)	**0.78 (0.76-0.81)**	**0.88 (0.85-0.90)**
Yes	3880 (72.0)	**34** (10,42)	Reference	Reference
Number of optimal access conditions				
None or one	510 (9.5)	**16** (7,35)	**0.56 (0.54-0.59)**	**0.72 (0.67-0.77)**
Two	817 (15.2)	**22** (7,41)	**0.70 (0.67-0.72)**	**0.88 (0.85-0.92)**
Three	1507 (28.0)	**29** (8,42)	**0.82 (0.79-0.85)**	**0.93 (0.91-0.95)**
Four	2555 (47.4)	**35** (14,42)	Reference	Reference

Median scores that are at least two scores below the sample median of 31 are bolded in red and those at least two scores above the sample median are bolded in green.

Results are based on Negative Log Binomial models, with estimation of dispersion parameter (MLE). Model controls for year of pregnancy, repeat observations (i.e.persons who submitted two MADM scores), place of residence during pregnancy (5 categories, from rural/remote to urban) and the pregnancy reported on (first, second, third or fourth or higher).

Table 5: Access to prenatal midwifery care (n= 5389)

	% who had a midwife as their primary prenatal provider *
Race/ethnicity	
Indigenous	69 (22.9)
Black	40 (28.4)
Middle Eastern	16 (15.2)
South Asian	40 (42.1)
East Asian	48 (29.6)
Latine or Hispanic	37 (35.9)
Other	32 (39.0)
White	1366 (38.5)
Gender identity	
Cis Gender	1528 (36.8)
Gender minority/gender diverse	44 (38.3)
Sexual identity	
Heterosexual	1308 (35.6)
Sexual minority	282 (44.8)
Age at start of pregnancy	
< 25 years	105 (22.0)
25-34	1130 (37.7)
35 and over	386 (40.3)
Education	
Some high school or high school completed	66 (21.0)
Some college or apprenticeship completed	331 (33.1)
Undergraduate degree	552 (38.7)

Graduate degree/professional degree	618 (41.6)
Disability	
No	1488 (37.6)
Yes	105 (31.5)
Relationship status	
Single	23 (19.0)
Married or partnered	1570 (37.3)
Immigration history	
Born in Canada	1072 (36.7)
Immigrated within 3 years	58 (29.7)
Immigrated within 4-6 years	54 (40.9)
Immigrated > 6 years ago	436 (37.3)
Substance use during pregnancy	
No	1488 (37.4)
Yes	57 (31.5)
Ability to meet financial obligations	
Income more than enough	909 (41.1)
Income Enough	586 (34.0)
Income not enough	95 (27.9)
# of social services needed during pregnancy	
None	1106 (39.4)
1	189 (37.7)
2 or more	39 (21.1)

*The type of care provider most directly involved in my PRENATAL care (i.e. visits for check-ups and advice on your pregnancy)

Supplementary file 1: Description of variables included in the analysis

Preferences for leading decisions

Because preferences for decision-making may be linked to MADM scores, we included the following question in the analysis: How important is it to you to lead the decisions about your pregnancy, birth and/or baby care. Likert response options ranged from extremely important to not at all important.

Socio-demographic characteristics

We asked RESPCCT participants to tell us how they describe their ethnicity or cultural heritage. They were encouraged to check all that apply from the following list:

Indigenous to Canada: First Nations, Métis, or Inuk (Inuit)
Indigenous to another region or country
Black
Central Asian
East Asian
Latine or Hispanic
Middle Eastern
South Asian
South East Asian
White
You don't have an option that applies to me. I identify as:
Mixed or multi-ethnic; please specify:
I prefer not to answer

For each of the categories above participants were directed to follow-up questions that enabled them to provide more details. For example, participants who reported that they identify as Indigenous to Canada were shown additional questions about whether they identify as First Nations, Métis, Inuk (Inuit) or Other, please specify. They could also write down the name of their community or Nation.

Respondents who chose multiple categories were recoded as follows: participants who noted that they were Indigenous to Canada, and also checked another category were coded as Indigenous. Some participants indicated that they were Indigenous to other countries. As this group was very small we opted to categorize them according to the other categories they provided. Those who identified as Black, but not Indigenous to Canada were coded as Black, even if they checked other categories. RESPCCT participants who identified as Asian, but not black and/or Indigenous to Canada were coded as

Asian. This iterative coding scheme was continued with Middle Eastern and Hispanic participants, in that order. This means that those who identified as white and another category were always assigned to the other category. For example, a childbearing person who checked that they identified as Middle Eastern and white were assigned to the Middle Eastern category. Because of this coding approach, the only category that did not include people who identified with two or more groups was the white category. Participants who checked 'Multi-ethnic' and other responses were allocated to one racial category according to the iterative approach described above. Those who only checked' multi-ethnic' and no other fields remained in that category.

There are three Indigenous groups/Nations recognized by the Government of Canada: First Nation, Metis and Inuit. First Nations each have their own distinct cultures and languages, and variation even within the groups. Due to the smaller sample of respondents identifying as Indigenous, a nations distinct analysis was not possible although we make no assumptions that they are homogenous or that policy implications are the same for all nations.

Age: Age at start of pregnancy was determined by subtracting the respondents' birth year from the year they found out they were pregnant.

Gender identity: Those who identified as Women or Cis Gender were coded 0 and those who identified as trans, two spirit, non-binary, or none of the above were grouped together as a gender minority and coded 1.

Sexual identity: Those who identified as heterosexual were coded 0 and those who identified as gay, lesbian, bisexual, pansexual, queer, two-spirit, asexual, unsure, or none of the above were grouped together as a sexual minority and coded 1.

Education: Participants were asked to note the highest level of education they had completed at the beginning of the pregnancy they are reporting about. The first three response options (Grade 7, Grade 10, High school) were recoded into 'Some high school or high school completed'; the next two response options (Some university or college, Apprenticeship) were recoded into 'Some college or apprenticeship completed' and the response options 'Undergraduate university degree' and 'Graduate/Professional university degree' were kept as is. People who checked 'Other' were excluded from analysis.

Disability: RESPCCT participants were asked whether during pregnancy they identified as a person with a disability. (i.e. they were limited in some way in activities because of physical, mental, or emotional problems; or had a health problem that required the use of special equipment, such as a cane, a wheelchair, a special bed, or a special telephone). Response options included 'Yes, No, Prefer not to answer'. The last response option was excluded from analysis.

Relationship status during pregnancy was coded into two categories: Single versus Married or Partnered. 'Other' responses were excluded.

Immigration history: Respondents were asked how long they had lived in Canada at the time of their pregnancy. Response options included: Not applicable; I was born in Canada,

Less than 1 year, 1-3 years, 4-6 years and more than 6 years. The first two options were collapsed into 'Immigrated within 3 years' and the others maintained as is.

Place of residence during pregnancy was ascertained with the following question: During the chosen pregnancy, I lived mostly in a: Rural area (less than 1,000 people), Small town (between about 1,000 and 29,999 people), Medium-sized city (between about 30,000 and 99,999 people), City (more than 100,000 people to 499,999), Big City (more than 500,000). People who checked 'I don't know' or 'Other' were excluded.

Participants were asked which year they first learned about their pregnancy. *Year of pregnancy* was included, to understand whether changes in reported autonomy increase over time, as would be expected in a health system that is moving towards patient centered care.

Substance use during pregnancy: This variable was created based on responses to two survey questions: People who reported using drugs 'often' or 'sometimes' during pregnancy or replied 'Prefer not to answer' and/or reported use of cannabis, stimulants, opioids or methadone during pregnancy were coded as 'Yes'. The comparison group (no drugs) answered never to the question abvout substance use during pregnancy and reported none of the drugs described above. Those who consumed tobacco products or alcohol were included in both groups as neither alcohol nor tobacco were included in our definition of 'drugs'.

Ability to meet financial obligations: RESPCCT participants responded to the question: During or before my pregnancy, my household income was enough to meet my households needs for: heat, electricity, transportation, housing, food, clothing and other necessary expenses. It was: More than enough, Enough, Not enough, Prefer not to answer/don't know. The last response option was excluded from analysis.

Number of social services needed during pregnancy: We counted the number of services that people needed during pregnancy including Welfare or Social Assistance, Drug or alcohol treatment, Mental health treatment, Help to quit smoking, Safe house or shelter, Homeless shelter, Resettlement or refugee settlement centre, Family protective services, Food banks, Disability resources/aids, Transportation assistance to access services, and Legal aid.

Participants could write in up to 3 additional types of services and these were also counted. We then recoded the sum into three categories: None, 1,2 or more.

Sense of belonging is measured by Statistics Canada, as an indicator of quality of life and social connection (cite). Participants responded to the question: Sense of belonging refers to how connected you feel to your community. How would you describe your sense of belonging to your community? We retained the first 4 response options (Very strong, Somewhat strong Somewhat weak Very weak) and removed the 'I don't know' responses.

Pregnancy characteristics

Pregnancy risk level was assessed using the following survey item: I was told by my provider that my pregnancy was "high risk". Response options included: Yes, No and I am not sure. The latter response option was removed from analysis.

Mental health treatment during pregnancy: Participants were asked to review a list of potential physical and mental health issues that can impact pregnancy. Those who reported that they experienced

Anxiety, requiring treatment or Depression, requiring treatment or 'Other mental health concerns, requiring treatment were defined as 'Needing mental health treatment during pregnancy'.

Pre-pregnancy BMI was calculated based on the weight and height that respondents provided. For weight, respondents were asked: As best you can remember, what was your weight just before you became pregnant? If you are not sure, your best estimate will do. Pre-pregnancy BMI was recoded according to the WHO classification system.

Pregnancy Order: As autonomy in decision-making might differ depending on the number of pregnancies people's experienced, this variable was also included with four levels: First, second,third or fourth or higher order pregnancy.

Access to preferred care

In this section, we included four variables; three with yes/no response options 'Did you get prenatal care as early as you liked?, 'I was easily able to find my preferred type of prenatal provider (family physician, midwife or obstetrician','I was able to choose my preferred place of birth (home, hospital, or, where available, birthing centre)' and one variable with Likert response options 'I felt that I had enough time during prenatal visits'. Response options ranged from strongly disagree to strongly agree.

Supplemental File 2: Internal Consistency Reliability of different language versions of MADM Scale

Language version	# who completed scale	Cronbach's alpha
Previous Pregnancy -Healthcare provider 1		
Arabic	31	0.89
Chinese -simplified	10	0.93
Chinese -traditional	20	0.94
English	4695	0.95
French	474	0.96
Inuktitut	0	--
Punjabi	5	--
Spanish	12	0.97
Current Pregnancy- Healthcare provider 1		
Arabic	2	--
Chinese -simplified	1	--
Chinese -traditional	1	--
English	136	0.93
French	4	--
Inuktitut	0	--
Punjabi	1	--
Spanish	0	--
Previous Pregnancy -Healthcare provider 2		
Arabic	13	0.93
Chinese -simplified	3	--
Chinese -traditional	6	--

English	1446	0.96
French	156	0.98
Inuktitut	0	--
Punjabi	2	--
Spanish	2	--
Current Pregnancy- Healthcare provider 2		
Arabic	0	--
Chinese -simplified	0	--
Chinese -traditional	1	--
English	28	0.96
French	2	--
Inuktitut	0	--
Punjabi	1	--
Spanish	0	--

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