

Original Article

Stress and anxiety associated with lack of access to maternity services for rural parturient women

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Abstract

Objective: The objective of this study is to compare the level of stress and anxiety between women resident in communities with different degrees of access to local maternity services.

Design: Cross-sectional survey.

Setting: Fifty-two communities across rural British Columbia with different levels of access to maternity care services (ranging from no services to local specialist obstetrician).

Participants: A total of 187 women, 40 of whom were from communities with no local access to services.

Main outcome measures: Stress score on the Rural Pregnancy Experience Scale including financial and continuity of care subscales.

Results: Parturient women who had to travel more than one hour to access services were 7.4 times more likely to experience moderate or severe stress when compared to women who had local access to maternity services.

Conclusions: Lack of access is strongly associated with stress in rural parturient women.

KEY WORDS: access to health service, cross sectional survey, rural pregnancy, stress and anxiety.

Introduction

Pregnancy and delivery can be a stressful time for rural women who lack local access to local maternity care services.^{1–4} It has been noted to be particularly stressful for Aboriginal women who might have stronger kinship ties and historical relationships to the land.⁵ Many rural and remote regions in countries such as Canada and Australia have policies in place recommending that women from communities lacking services relocate to a

referral community between 36 and 38 weeks gestation to ensure that they do not experience a precipitous delivery in their home community.^{2,6,7} It has been suggested that multiparous women with previously uncomplicated births might be significantly more stressed than nulliparous women by having to relocate to access basic maternity services.⁴ This is because of the challenges of separation from home and community which are amplified for parturient women if older children must remain at home, separated from their mother while they await the birth of their sibling.^{2,8,9} There are also significant financial costs of extended stays away from home, such as travel, accommodation and food expenses. This financial stress is most acutely felt by vulnerable women with limited financial and social resources.² In addition, women who live in rural and remote communities often experience decreased continuity of maternity care,^{1,10} which might increase stress and anxiety.

In the past 10 years, coincident with the regionalisation of health care services, there has been a wave of closures of small rural community maternity services across Canada.¹¹ The rationale for closures has rested on perceived fiscal economies of scale,^{12,13} difficulties overcoming challenges to recruitment and retention of skilled rural practitioners¹⁴ and concerns about the safety of small rural services.^{15,16} Consequently, more rural women have to travel to access services in spite of the logistical and health-outcomes challenges posed. Literature suggests this might lead to increased stress and adverse outcomes including increased rates of premature delivery, increased need for intervention and increased costs of neonatal care.¹⁷ Larimore¹⁸ has gone so far as to project increased rates of perinatal mortality related to lack of local maternity care providers in rural counties in Florida. It has been suggested that physiological outcomes of stress in this population might lead to increased adverse outcomes. An important step in the process of illuminating the potential association between stress and adverse outcomes is to measure the psychological well-being of parturient women from rural communities with different levels of local services. To that end we have developed and validated a survey

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What is already known on this subject:

- Previous exploratory work has suggested that lack of local access to maternity services is stressful for some rural parturient women. Recent validation of the Rural Pregnancy Experience Scale has established a tool to quantify the extent of psychological stress and anxiety related to this phenomenon.
- This study provides first steps in uncovering the extent of psychological distress association with lack of local services. This is important for two reasons: (i) this might be the physiological pathway linking to adverse perinatal outcomes such as prematurity and (ii) this should provide rural health service planners with better information with which to plan appropriate services for rural communities.

tool to measure rural women's experiences of pregnancy, the Rural Pregnancy Experience Scale (RPES).¹⁹

The purpose of this study is to report findings on the measurement of stress and anxiety experienced by parturient women living in rural and remote communities with differing levels of access to maternity services.

Methods

Data collection

A third-party method of recruitment was used. Surveys were distributed to maternity care providers, prenatal educators and nurses in 52 rural communities over the course of 13 months. These individuals then offered the surveys to parturient women in their care. Communities were selected to include diversity in size from small remote communities without local intrapartum maternity services to referral communities staffed by full-time specialist obstetricians and variation in ethnic composition. Pregnant women in their second or third trimester were asked to complete the survey at their convenience and supplied with a self-addressed stamped envelope for return. In order to establish the actual response rate, we attempted to contact each of the participant care providers at the conclusion of the study to document how many surveys they had distributed. Ethics approval for this study was obtained from the behavioural research ethics board of the University of British Columbia, Vancouver, Canada.

What this study adds:

- We now know that rural women without local access to maternity services are 7.4 times more likely to experience moderate or severe stress when compared to those with access to local services. Both financial issues and lack of continuity of care are complicit in contributing to this stress.

Survey and measures

The questionnaire was divided into two sections. Section 1 asked women to respond to basic demographic questions, including age, cultural background, marital status, educational level and family income. In this section, we also asked women pregnancy-specific questions, for example, how many previous pregnancies they had had, and whether they experienced any medical complications during a previous or the current pregnancy (specifically previous preterm birth, previous stillbirth, high blood pressure, breech presentation, twins or multiples during current pregnancy and other significant medical problems).

Section 2 included the RPES and the Depression Anxiety Stress Scale. The RPES is a 20-item scale that measures anxiety and stress associated with remote birth. The creation of this scale was based on extensive qualitative research with parturient women in rural British Columbia² and items were revised by an expert panel of care providers and decision makers from rural communities. Options for the RPES items ranged from (1) Strongly Disagree to (5) Strongly Agree with 3 indicating a neutral attitude towards the item. Higher scores on the scale indicate higher levels of stress and anxiety during pregnancy, with four items being reverse scored (see Table 1 for the specific items). The RPES has two subscales: financial worries (9 items), and stress and anxiety associated with continuity of care, psychosocial support and realising one's vision of birth (11 items). Cronbach alphas for the full scale (0.91) and subscales (0.89, 0.88) were excellent and convergent validity of the RPES with a similar measure (Depression Anxiety Stress Scale) was good. The RPES is the first validated scale to address issues, such as separation from family and community and financial concerns, known to be particularly relevant to rural parturient women who have to relocate to give birth. The development and psychometrics of the RPES are described elsewhere.¹⁹

Analysis

We calculated mean scores and standard deviations for each RPES item for women with and without local

TABLE 1: Average Rural Pregnancy Experience Scale scores of women living in communities with and without local maternity services

Item	No local services M (SD)	Local services M (SD)
Subscale 1 – financial worries (9 items)		
I am worried about loss of family income due to pregnancy and birth	3.28 (1.38)	2.98 (1.24)
It will be difficult for me to make arrangements (e.g. for childcare, eldercare, house sitting, pet sitting) during labour and birth	2.90 (1.48)	2.10 (1.17)
I am worried that I will not have enough money to cover accommodation costs immediately before and after labour and birth	2.55 (1.50)	2.02 (1.12)
I am worried that I will not have enough money to cover travel costs associated with pregnancy (e.g. to travel to prenatal appointments and tests)	2.49 (1.39)	1.88 (1.04)
I am worried that I will not have enough money to cover travel costs associated with labour and birth	2.46 (1.43)	1.84 (0.99)
I am worried that I will not have enough money to cover other expenses (such as childcare) at the time of birth	2.41 (1.48)	2.11 (1.19)
I am worried that I will not have enough money to access prenatal care	1.95 (1.16)	1.88 (1.02)
I am worried about how I am going to get home after I give birth	1.83 (1.01)	1.58 (0.77)
I have missed prenatal tests because I (my family) was unable to pay for them	1.59 (0.81)	1.40 (0.54)
Subscale 2 – continuity of and access to maternity care, psychosocial support, vision of birth (11 items)		
I am concerned that I might be separated from my family during pregnancy and/or labour and birth	3.00 (1.57)	2.33 (1.15)
I am worried that my loved ones will not be present to support me during my labour and birth	2.85 (1.60)	2.24 (1.22)
I am concerned that I could deliver with a caregiver who does not know/understand what I want for my labour and birth	2.83 (1.36)	2.51 (1.22)
I am worried that I might need to get transferred (to a different community) during labour	2.75 (1.30)	2.58 (1.34)
I am worried that my needs will not be met during my labour and birth	2.63 (1.35)	2.63 (1.12)
I am confident that I will have the kind of birth that I envision for myself and my baby†	2.58 (1.17)	2.61 (0.90)
I am worried that my needs will not be met during my pregnancy	2.48 (1.19)	2.19 (1.02)
I am concerned about whether my maternity care provider will be able to manage possible complications during pregnancy and birth	2.32 (1.16)	2.21 (0.95)
I am confident that I will have access to specialist services (Caesarean section) in a timely manner in the event of an emergency during labour or birth†	2.23 (1.23)	2.33 (1.09)
I feel satisfied with the prenatal care I am receiving†	2.13 (1.08)	1.82 (0.88)
I am satisfied with the level of continuity of care I receive†	2.10 (0.95)	2.01 (0.91)

†These items were reverse scored when calculating the scale score. SD, standard deviation.

access to maternity services, and results for each item are presented in Table 1. Average scores on the RPES full and subscales were calculated for women grouped by the obstetric service level available in the respondent's home community (Table 2). Service levels ranged from no local services within 60 min or more of surface travel time to local specialist maternity services. We split the RPES score into a score for low stress (<60) and high stress (≥ 60). In order to test independent predictors of stress and anxiety, we performed a logistic regression analysis with the categorical RPES score as the outcome variable (Table 3). Obstetric service level was dummy coded into two categories (category 1: no local services

within one hour of woman's residence; category 2: maternity services provided by generalist) and the comparison service level was specialist services. We were primarily interested in determining whether lack of local obstetric services in the woman's home community predicts stress and anxiety, while controlling for maternal characteristics and risk factors. These included maternal age, parity, educational level (five levels ranging from no high school diploma to university degree), household income (below or above \$25 000), ethnicity (First Nations or non native), lone parent status and self-identified complications with previous or current pregnancy, including previous preterm baby, previous

TABLE 2: Average RPES scores by obstetric service level

Maternity service level	Definition of service level	n	Mean, range, standard deviation			% of women with RPES scores >60
			RPES total	RPES subscale 1 (finance)	RPES subscale 2 (access)	
1. No local services	No maternity services within one hour	40	52.78, 26–82, 16.03	21.50, 9–40.5, 9.43	31.11, 15–45, 8.36	35.9
2. Local services (Generalist)	Local maternity services provided by family physician or GP surgeon	71	50.30, 28–80, 10.52	19.08, 9–37, 7.01	31.21, 19–43, 5.37	12.7
3. Local Services (Specialist)	Local maternity services provided by at least one specialist	75	44.02, 26–71, 9.90	16.68, 9–33, 5.91	27.34, 16–44, 5.37	8.0

* $P < 0.05$. One respondent did not report her home community. Pearson's $\chi^2 = 15.890$ (d.f. = 2), $P < 0.001$. RPES, Rural Pregnancy Experience Scale.

stillbirth, breech presentation, high blood pressure, multiples or other significant complication.

Results

Surveys were distributed by 62 care providers in 52 communities. The response rate of completed surveys out of those distributed was 27% (108 returned of 406 distributed by 37 providers). We also received an additional 79 surveys distributed by the remaining 25 providers who did not respond at the end of the survey to let us know what proportion of surveys had been distributed. Our final sample size is of 187 women. The mean age of respondents was 29 and 54% were nulliparous. Only two of the 29 First Nations respondents resided within communities without local obstetric services.

Table 1 provides the rank-ordered means (range: 1–5) for each of the survey items comparing women without local services to women with local access to intrapartum services.

Table 2 reports mean and categorical RPES scores across obstetric service levels.

Women without access to maternity services were significantly more stressed and anxious than women with access to services (Pearson's $\chi^2 = 15.890$ (d.f. = 2), $P < 0.001$).

Table 3 examines the effect of various demographic characteristics and obstetric service level on the level of stress and anxiety experienced by rural parturient women.

Women residing in communities without access to local maternity services were 7.4 times more likely to experience stress and anxiety associated with remote birth compared to women residing in communities with local services provided by at least one specialist, controlling for maternal age, parity, educational level, household income, ethnicity, lone parent status and pregnancy complications. Women with a household income below \$25 000, those without a high school diploma, women with at least one self-identified complication of pregnancy and Aboriginal women were more likely to experience stress and anxiety during pregnancy, although the odds ratios associated with these variables were not significant.

Discussion

This study dramatically demonstrates the increased levels of stress and anxiety associated with lack of access to local maternity services within one hour surface travel time. Because of the cascade of rural maternity closures Canada wide,¹¹ more women will be exposed to having to travel to access services and associated stress and anxiety and potential adverse outcomes. Within the

TABLE 3: Logistic regression model, testing for independent predictors of stress and anxiety (score of ≥ 60) among rural parturient women

Predictors	Standard beta coefficient	OR	95% CI	P
Maternal characteristics and risk factors				
Maternal age	0.058	1.059	0.967–1.161	0.218
Nulliparity	−0.53	0.948	0.383–2.350	0.909
Educational level	0.357	1.430	0.412–4.961	0.574
Household income below LICO	0.515	1.673	0.464–6.034	0.432
Ethnicity	1.058	2.881	0.812–10.219	0.101
Lone parent	−0.96	0.908	0.227–3.643	0.892
Self-identified complication with previous or current pregnancy	0.420	1.522	0.539–4.298	0.428
Obstetric service level				
No local maternity services within one hour	2.001	7.435	2.324–23.789	0.001
Local maternity services provided by generalist	0.331	1.392	0.397–4.877	0.605

CI, confidence interval; LICO, low income cut-off; OR, odds ratio.

policy and planning process, however, the issue of access has remained largely a social consideration rather than a potentially clinically important issue. Integrating this emerging understanding into the planning process as part of the evidence around the safety of rural services will lead to a more comprehensive understanding of where services should be located. Previous data shows that women with limited resources find the logistics of leaving their community most challenging and are most unlikely to be able to cope with the experience of being away² and are likely to incur the greatest degrees of avoidable stress. The sample for this study was too small to demonstrate this; further research with a larger cohort of participants, particularly First Nations women is needed.

In rural communities, women who have had previous complicated pregnancies or deliveries are not expected to deliver locally. For this group, the lack of local access likely makes little difference. However, women who have had previous uncomplicated pregnancies and vaginal deliveries would be prime candidates for giving birth locally if services existed. It is this group, forced to relocate families or be separated, however, that likely incur the greatest degree of avoidable stress.

This study documents significant rates of psychological morbidity associated with barriers to access to maternity care. The implications of these findings are that stressing vulnerable rural parturient women is likely to be associated with adverse perinatal outcomes (e.g. prematurity) which can lead to expensive neonatal care. This is consistent with previous research suggesting that high outflow communities lead to adverse outcomes and high costs of neonatal care.^{17,20} Further research is needed to confirm these findings across rural

Canada and internationally using a larger cohort of communities. This study also needs to be replicated to examine more closely the relationship between distance as a continuous variable and stress which will provide data needed by policy makers and planners for a rational approach to the location of rural maternity services.

The main limitation of this study is the relatively low response rate 27%. However, this is likely an underestimate as the distribution of surveys was a two-phase process with the local care provider or clinic personnel receiving surveys from the research team and then distributing them to parturient women in their care. We were only able to contact 37 of the distributors at the end of the study to determine how successful distribution of surveys had been and we learned from these providers that they had distributed 86% of the surveys they had received. In order to err on the side of caution, we assumed that the distributors we were unable to contact distributed a similar proportion of their surveys. It is more likely that those who failed to respond to follow up were not the most enthusiastic at distribution either and likely the response rate is closer to 30%.

An additional limitation is the underrepresentation of First Nations women within study sample. However, previous qualitative work suggests higher levels of stress among First Nations women when compared to their non-First Nations counterparts, indicating it is likely we have underestimated the extent of stress in the population.

Additionally, the data was collected in one province, British Columbia, with unique geographic and health services conditions; therefore, the degree of generalisability to other jurisdictions is limited until further research is completed.

Conclusion

Rural parturient women who have to travel more than one hour to access services are significantly more likely to experience stress and anxiety. Further research is needed to explore the generalisability of these findings to other rural communities in Canada and internationally.

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Author contributions

Jude Kornelsen: Involved in all part of the research from securing funding, conceptualising, data collection, analysis and primary author for the manuscript.

Kathrin Stoll: Responsible for ensuring rigour of methods, undertaking data analysis and contributed to authorship.

Stefan Grzybowski: Contributed to conceptualisation, oversaw data collection and analysis and contributed to writing.

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