



Vulnerable Women's Perceptions of Individual Versus Group Prenatal Care: Results of a Cross-Sectional Survey

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Abstract

Introduction Vulnerable pregnant women (e.g. women with low socio-economic status or recent immigrants) are less likely to receive adequate prenatal care or to attend perinatal education classes. *CenteringPregnancy* (CP) is a model of group prenatal care which combines assessment, education and support. This study aimed to assess patient experience among vulnerable women in group prenatal care compared to individual care. **Methods** Women participating in CP at a community-based health centre in urban Alberta were eligible to participate. A convenience sample of women who received individual care at a low-risk maternity clinic served as comparison. Women were asked a series of questions on their prenatal care experience. Demographic and patient responses were compared using Chi square, fisher's exact and *t* tests. **Results** Forty-five women accessing CP and 92 women accessing individual care participated. Women in CP were younger, more likely to be single and having their first baby than women in individual care. Women in CP were significantly more likely to report having received enough information on exercise during pregnancy (92 vs. 66%, $p=0.002$), breastfeeding (95 vs. 70%, $p=0.002$) and baby care (95 vs. 67%, $p=0.001$). Women in CP were more likely to report that they felt their prenatal care providers were interested in how the pregnancy was affecting their life (100 vs. 93%, $p\leq 0.001$). **Discussion** Group prenatal care provides a positive experience and improved information exchange among vulnerable populations. Programs interested in engaging, educating and empowering vulnerable pregnant women may benefit from implementation of group care.

Keywords Prenatal care · CenteringPregnancy · Patient experience · Vulnerable women

Significance

What's known on this topic? While CenteringPregnancy has had positive outcomes in vulnerable populations in the United States, few studies evaluate the model among

vulnerable women in a publicly funded system. *What this study adds?* This study describes a positive patient experience with prenatal care among vulnerable pregnant women in Canada. Importantly, participation in CP provided sufficient information about pregnancy and baby care and women formed positive relationships with their prenatal care providers.

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Introduction

Prenatal care is one of the most common forms of preventative health care services (Alexander and Kotelchuck 2001). Prenatal care includes a variety of tests and procedures to assess risk, treatment for medical conditions and provides education and information about nutrition and lifestyle behaviours for health pregnancy and is typically provided by a physician or midwife in Canada (World Health Organization 2016). A key component of prenatal care is information and advice provided on a wide variety of subjects including

nutrition, exercise, and healthy lifestyles. However, many women supplement standard prenatal care by health care providers with prenatal education classes (Chalmers et al. 2008; Godin et al. 2015). These classes vary widely in their content and format, but generally include information on healthy behaviours and preparation for childbirth and parenthood (Gagnon and Sandall 2007). Additionally, the group format of prenatal education classes may help pregnant women develop social support networks and promote confidence (Gagnon and Sandall 2007). The benefits of prenatal education are difficult to measure, as classes tend to vary greatly in length, content and structure. Two systematic reviews were unable to draw any overall conclusions about the effectiveness of prenatal education on birth outcomes; however, knowledge about pregnancy and birth is improved with prenatal education (Brixval et al. 2015; Gagnon and Sandall 2007). Generally, prenatal classes are very popular, especially among primiparas women (Chalmers et al. 2008).

Prenatal medical care in Canada is provided by physicians, midwives or obstetricians and is a publicly funded service with no direct point of service charge to patients. In Canada, almost all women get some form of prenatal care, with an average of 13 visits (Chalmers et al. 2008). However, not all women receive adequate or timely prenatal care. According to the Maternity Experiences Survey, a nationally representative survey in Canada on perinatal experiences, the proportion of women receiving inadequate care (fewer than five prenatal care visits) ranges from less than 1% in Quebec, to over 7% in Nunavut (Bartholomew 2009). Overall, 5% of women had their first prenatal visit after the first trimester, with younger age, lower education, and lower income being risk factors for late initiation of prenatal care (Bartholomew 2009). In Manitoba, Heaman et al. (2007) and colleagues found that being single, unemployed, Aboriginal, as well as living in a neighbourhood with lower median education levels or higher proportions of immigrants were all risk factors for receiving inadequate prenatal care. In highly vulnerable populations, the proportion of women receiving inadequate care increases. A study of newcomers (refugees and recent immigrants) to Toronto found that 32.7% of newcomers received inadequate care (Wilson-Mitchell and Rummens 2013).

Access to prenatal education classes also varies. A study conducted in the United States found that Caucasian women were twice as likely as African American women to attend classes, and higher education, income, and being married also increased attendance (Lu et al. 2003). In Canada, approximately 65% of primiparas women attended prenatal classes (Chalmers et al. 2008). Women with lower income were less likely to attend and the fee based structure of classes may be a barrier (Bartholomew 2009).

Group prenatal care provides both prenatal medical care and prenatal education in a supportive group environment.

CenteringPregnancy (CP) is a well-known model of group prenatal care, developed in the United States in the 1990s (Rising 1998). Approximately 8–12 women, with similar due dates are grouped together for 10 sessions that are led by a physician, midwife or nurse practitioner skilled in group processes. Following an empowerment framework, women take additional responsibility for their own care by, for example, taking their own weight and blood pressure measurements. Women have individual time with a health-care practitioner, and education topics are discussed in a group format. CP provides relationship centered care among women and between women and their healthcare providers by enabling supportive environments (Massey et al. 2006). The overall evidence suggests that group prenatal care is not associated with any adverse outcomes for mothers or their babies, and individual studies show a benefit to group care, including decreases in preterm birth and increased birth-weight (Homer et al. 2012; Ickovics et al. 2007; Picklesimer et al. 2012; Ruiz-Mirazo et al. 2012; Tanner-Smith et al. 2014).

Most of the literature to date evaluating the effectiveness and patient satisfaction with CP, or other models of group prenatal care, has been carried out in the US (Baldwin 2006; Heberlein et al. 2016; Ickovics et al. 2011; Kennedy et al. 2011; Shakespear et al. 2010; Tanner-Smith et al. 2014). Lack of insurance is consistently associated with inadequate prenatal care in studies in the US, but not in countries with universal health care coverage (Feijen-de Jong et al. 2011). In Canada, barriers to adequate prenatal care include structural barriers and qualities of care providers such as lack of time, and reduced information sharing (Heaman et al. 2015). Understanding whether women in a publicly funded system are satisfied with the information and quality of care they receive with CP compared to traditional care will provide evidence for strategies for engaging vulnerable women in prenatal care.

The purpose of this study was to evaluate the effect of CP on patient outcomes among vulnerable women compared to individual care within a publicly funded health care system. Specifically, we assessed if women felt they received adequate information on health topics, their sense of readiness for birth, overall satisfaction with prenatal care, and relationship with prenatal care providers.

Methods

Study Participants

Women participating in a CP program offered at an urban community health care center in Alberta between January 2015 and August 2016 were eligible to participate. This community health center offers a wide variety of health care

and support services to low income and vulnerable populations. The CP program, consisted of 8–12 women, with approximately 8 sessions held during the prenatal period and 2 sessions postpartum. Sessions were delivered by a physician and perinatal educator and supported by a program coordinator. A detailed description of the CP curriculum can be found elsewhere (Rising 1998). Women who had received individual prenatal care at a low risk maternity clinic run by the same physician group in the same geographic area of the city served as a comparison group. These women were asked if they were interested in participating in an evaluation of prenatal care by front desk staff and were enrolled consecutively over a 2-week period in November 2015.

Data Collection and Measurement

For women in the CP program, participants filled out an evaluation form and consented to participate in research during the 9th session, shortly after their baby was born. Women filled out the form independently in free time at the beginning of the session. The evaluation form was passed out and collected by the program coordinator, and women were assured their answers were confidential. Women received an additional written consent form at the same time. Women in individual care filled out an evaluation form while waiting for their 6-week postpartum appointment. Neither group received an incentive to participate. The evaluation form included questions about whether or not they had received adequate information on various pregnancy-related topics, felt prepared for the birth experience, their relationship with prenatal care providers, satisfaction with prenatal care and current breastfeeding practices. These questions were adapted from the quality of prenatal care questionnaire, and standard CP program evaluation questions (Heaman et al. 2014). The evaluation form also included basic demographic information (age, marital status, parity), and a social support checklist. Social support was measured using a modified version of the pregnancy risk assessment monitoring system (PRAMS), which was modified to measure both types and sources of support (Broadhead et al. 1988; Nkansah-Amankra et al. 2010). Additionally, CP participants also completed a standardized clinic intake form that included information about receipt of social assistance, immigration status and educational attainment.

Analysis

Demographic and patient experience responses for CP and individual care participants were compared using Chi square, fisher's exact and *t* tests. We used a Benjamini-Hochberg procedure to adjust for multiple testing (Glickman et al. 2014). The Benjamini-Hochberg procedure ranks the *p*-values of all tests (smallest to largest) and then the

p-value is compared to a critical value set at: $(i/m)Q$ where *i*: rank of the *p*-value (lowest to highest), *m*: total number of tests (17) *Q*: false discovery rate (0.05). To account for difference in parity between the samples, we confirmed the bivariate analysis by stratifying by parity. All analyses were conducted in STATA v.13. (StataCorp 2013).

Ethics

Ethics approval was received from the Conjoint Research Ethics Board at the University of Calgary (Ethics ID: REB15-0236).

Results

Of the approximately 90 women who enrolled in the CP program, 45 consented to participate in research (50%). Ninety-two women accessing individual care agreed to participate. Demographic information on participants is presented in Table 1.

Patients in the CP group were significantly younger, more likely to be single, and more likely to be having their first baby. We did not have demographic information on the individual care patients regarding first language, country of origin or income. However, compared to a representative sample of the perinatal population in urban Alberta from a longitudinal cohort study (All Our Families), the CP patients were more likely to have a first language other than English (31 vs. 12%), be born outside Canada (36 vs. 20%), have a household income lower than \$30,000 per year (46 vs. 6%) and have high school education or less (35 vs. 11%) (McDonald et al. 2013).

Bivariate differences in responses to having adequate information on various pregnancy-related topics, feeling prepared for the birth experience, relationship with prenatal care providers, satisfaction with prenatal care and breastfeeding are presented in Table 2. The majority of women in both groups (over 65%) reported that they had received enough information about common changes in pregnancy, pregnancy testing, nutrition, weight gain, alcohol and depression. Women in CP were significantly more likely to report receiving enough information on exercise (92 vs. 66%), labour (100 vs. 84%), breastfeeding (95 vs. 70%) and baby care (95 vs. 67%) than women in individual care.

In terms of experience with care received, women in both groups reported high levels of agreement (over 80%) to the following topics: being comfortable with prenatal care providers, being able to contact someone if necessary, having enough time for questions and satisfaction with prenatal care. Women in CP reported higher levels of agreement with preparedness questions such as: having enough information to make decisions for themselves (100 vs. 88%) and feeling

Table 1 Demographic characteristics

	CP patients			Individual prenatal care			p-value [‡]
	n = 45			n = 92			
	n	% ^a	95% CI	n	% ^a	95% CI	
Age of participants (mean, SD)	28.8	4.6	(27.4, 30.3)	30.5	4.2	(29.6, 31.4)	0.046
Woman has a partner	36	83.7	(69.3, 93.2)	91	98.9	(94.1, 100.0)	0.001
First baby	27	71.1	(54.1, 84.6)	46	50.0	(39.4, 60.6)	0.028
First language other than English ^b	14	31.1	(18.2, 46.6)				
Born outside Canada ^b	16	35.6	(21.9, 51.2)				
Household income <\$30,000	18	53.8	(37.2, 69.9)				
High school or less	13	35.1	(20.2, 52.5)				

^aSome variability in denominator due to missing data

^bDue to many blank responses on both first language and born outside Canada questions, blank responses were considered to be the default value (English and born in Canada)

[‡]p-values are for *t* tests, χ^2 , or fisher’s exact as appropriate

Table 2 Differences between CenteringPregnancy (CP) and individual care (IC)

	CP			IC			p-value ^{‡,*}
	n = 45	% ^a	95% CI	n = 92	% ^a	95% CI	
Topics (did you get enough information on...) (sufficient vs. insufficient)							
Common changes in pregnancy	37	97.4	(86.2, 100.0)	75	86.2	(77.1, 92.7)	0.107 [‡]
Pregnancy testing	30	78.9	(62.7, 90.4)	58	68.2	(57.2, 77.9)	0.224
Exercise	35	92.1	(78.6, 98.3)	56	65.9	(54.8, 75.8)	0.002 ^{‡,*}
Nutrition	36	94.7	(82.2, 99.4)	71	84.5	(75.0, 91.5)	0.143 [‡]
Weight gain	32	84.2	(68.7, 94.0)	78	87.6	(79.0, 93.7)	0.603
Alcohol	30	78.9	(62.9, 90.4)	68	78.1	(68.0, 86.3)	0.922
Labour	38	100.0	(90.7, 100.0)	70	84.3	(74.7, 91.3)	0.009 ^{‡,*}
Depression	31	81.6	(65.7, 92.3)	62	72.1	(61.4, 81.2)	0.261
Breastfeeding	36	94.7	(82.3, 99.4)	62	69.7	(59.0, 80.0)	0.002 ^{‡,*}
Baby care	36	94.7	(82.3, 99.4)	56	66.7	(55.5, 76.6)	0.001 ^{‡,*}
Birth preparedness and satisfaction with care (agree vs. disagree/neutral)							
Enough info to make decisions for myself	38	100.0	(90.7, 100.0)	75	88.2	(79.4, 94.2)	0.030 [‡]
Felt prepared for birth experience	35	94.6	(81.8, 99.3)	63	75.9	(65.3, 84.6)	0.020 [‡]
Providers had enough time to answer my questions	38	100.0	(90.7, 100.0)	75	90.3	(81.9, 95.7)	0.055 [‡]
Prenatal care providers were interested in how my pregnancy was affecting my life	38	100.0	(90.7, 100.0)	60	73.2	(62.3, 82.4)	<0.001 ^{‡,*}
I felt comfortable with my prenatal care providers	38	100.0	(90.7, 100.0)	78	92.9	(85.1, 97.3)	0.175 [‡]
I would always reach someone at my prenatal care providers office if I needed to	30	81.1	(64.8, 92.0)	71	86.6	(77.3, 93.1)	0.438
I was satisfied with the care I received	38	100.0	(90.7, 100.0)	77	92.8	(84.9, 97.3)	0.175 [‡]
Breastfeeding							
Has your baby received only breast milk since birth	14	42.4	(25.5, 60.8)	49	57.0	(45.8, 67.6)	0.155
Has your baby received breast milk in the last 7 days	28	84.8	(68.1, 94.9)	76	90.5	(82.1, 95.8)	0.513 [‡]
Social support							
Sufficient social support	26	74.3	(56.7, 87.5)	49	59.8	(48.3, 70.4)	0.134

p-values are for χ^2 tests, unless indicated by ‡ for Fisher’s exact test

*Statistical significance after Benjamini-Hochberg correction for multiple testing. Critical value set at: $(i/m)/Q$ where *i*: rank of the p-value (lowest to highest), *m*: total number of tests (20), *Q*: false discovery rate (0.05)

^aSome variation in the denominator due to missing data

prepared for the birth experience (95 vs. 76%), but these were not statistically significant after Benjamini-Hochberg adjustment for multiple comparisons. Women in CP were significantly more likely to agree that they felt their prenatal care providers were interested in how their pregnancy was affecting them (100 vs. 73%). No statistically significant differences between the groups for exclusive breastfeeding or social support at the end of prenatal care were found.

All statistically significant differences between responses of CP participants and individual care participants remained statistically significant when we restricted the analysis to first time mothers.

Discussion

Women are at risk of receiving inadequate or lower quality prenatal care due to socio-demographic differences such as income, education, age and immigrant status (Chalmers et al. 2008; Kingston et al. 2011). Even in publicly funded health care systems, such as Canada, these socio-demographic difference in access to care persist (Chalmers et al. 2008). No consensus exists on the optimal number of prenatal care visits. The WHO recommends at least 8 contacts, while the Society for Obstetrics and Gynecology Canada recommends visits beginning in the first trimester and with increasing frequency as the pregnancy continues (Society of Obstetricians and Gynaecologists of Canada 1998; World Health Organization 2016). Inadequate prenatal care is associated with adverse birth outcomes including preterm birth, small for gestational age and neonatal mortality (Heaman et al. 2008; Linard et al. 2018; Partridge et al. 2012) Women are more likely to remain in prenatal care if they are more satisfied with the care that they receive and feel respected by service providers (Edmonds et al. 2015; Mazul et al. 2017; Wheatley et al. 2008). Ensuring high quality care is especially critical for vulnerable groups who are have a higher risk of inadequate care.

This study provides evidence that the CP model is well received among women who are at risk of inadequate prenatal care. Despite being vulnerable on several demographic characteristics, women in CP reported equal or better outcomes than women in individual care. Specifically, women in CP reported higher levels of satisfaction with the amount of information they received on topics such as exercise in pregnancy, labour and delivery, breastfeeding and baby care. This is consistent with previous findings that women in individual care felt they lacked information on healthy lifestyle choices and counseling on stress, whereas women in group prenatal care felt they had more time to discuss and understand issues related to their health and that of their baby (Jafari et al. 2010; White et al. 2006). In several qualitative studies, care providers have noted that group prenatal care

allows for more time with their patients (McDonald et al. 2014; McNeil et al. 2013). The current study only measured whether women felt they had received enough information; however, a study in the US measuring knowledge levels before and after prenatal care showed that women in CP knowledge scores increased more than those in individual care (Baldwin 2006).

In terms of satisfaction with group prenatal care, our study found high rates of satisfaction with prenatal care in both groups, which is similar to a large-scale study in Sweden (Andersson et al. 2012). Our findings are also consistent with qualitative evidence from studies in Canada that suggest that both women and care providers report high levels of satisfaction with CP (McNeil et al. 2012, 2013). Women in CP in our study were more likely to report that they felt their prenatal care provider was interested in how their pregnancy was impacting their lives. This suggests that women in CP formed a positive relationship with their prenatal care provider, which is an important component to retaining vulnerable women in prenatal care (Heaman et al. 2015; Mazul et al. 2017). Because the prenatal care providers were the same at both sites, this suggests that the CP format was the key component in this difference.

Despite a difference in the proportion of women reporting adequate social support (74.3% in CP vs. 59.8% in individual care), this result did not reach statistical significance ($p=0.134$). Our study may also have been underpowered to detect differences; however, this result is consistent with the findings from Ickovics' et al. (2011) randomized control trial.

The strengths of this study were the ability to enroll vulnerable women, who are often reluctant to engage in research (Tough et al. 2007). Although we were not able to measure socio-economic status, primary language spoken at home, or immigrant status in the control group, it is likely that the CP group was more vulnerable than the control group on all characteristics. In addition, the prenatal care providers in the CP program were also providers at the clinic offering individual care, suggesting that differences seen reflect an effect of the CP program, and not just differences in prenatal care providers. The study was limited by our lower response rate and small sample size. Due to the way in which we recruited women from individual care, we were unable to calculate a response rate for this group. Only 50% of the CP women consented to participate in the research study. This low response rate was due to several factors. First, fewer women participated in the 9th session, which is when data was collected because many of them were in hospital, or had recently given birth. Second, the program coordinator mentioned that many of the women felt there were simply too many forms to fill in, and they did not understand the need for additional paperwork. Although most women who were present did

fill in the evaluation, not all consented to research. Consent forms can be lengthy and may seem irrelevant, which could have meant women simply skipped them. It is also possible that women who were more satisfied with the program, or who were more comfortable with English might have been more likely to consent to research. This would result in selection bias with more women favorable to the program consenting in research. However, women in individual care also represented a self-selected convenience sample, which may result in a similar bias in the control group. Women who were dissatisfied with their individual prenatal care would also be less likely to participate in a voluntary evaluation of their experience (Mazor et al. 2002). Our small sample size, 45 women in CP and 92 in individual care, limited our ability to conduct multivariable analysis. We were unable to control for differences in relationship status between our groups, since 99% of the women in individual care were in a relationship. Also, most women in the CP group were having their first child, which also limited our ability to conduct analysis among multiparous women. However, in first time mothers, all differences between the groups remained statistically significant. We were unable to use the full version of the quality of prenatal care questionnaire, which is recommended by its authors, as its length posed too great a burden for this vulnerable population. Finally, the overall high levels of positive results in both groups may have contributed to a ceiling effect, making differences between the groups harder to detect.

Women who are vulnerable due to socio-demographic factors are less likely to obtain adequate prenatal care. Women are often motivated to seek care in pregnancy to ensure the health of their baby and prenatal care can serve as an entry point to the healthcare system for women who have traditionally been marginalized by or excluded from health care (Heaman et al. 2015). This study shows that CP is a viable option to engage vulnerable women in prenatal care with high rates of satisfaction and improved information exchange. Programs and providers interested in engaging, educating and preparing vulnerable pregnant women may benefit from implementation of group care.

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