

PRENATAL SCREENING IN CANADIAN AND UNITED STATES MIDWIFERY PRACTICES: AN EXPLORATORY STUDY

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ABSTRACT

Midwifery practice in Canada and the United States (U.S.) developed along similar philosophical principles, but different practice models have evolved. Within these two frameworks of midwifery practice, this retrospective, exploratory study investigated the prenatal screening tests that often pose decision-making dilemmas for both clients and midwives. Women in the U.S. ($n=60$) were more likely to have four of the five prenatal screening tests than Canadian women ($n=56$). U.S. midwifery clients ($n=60$) more frequently received the genetic screen ($p=0.029$), HIV ($p=0.0005$), ultrasound ($p=0.0005$) and serum glucose screen ($p=0.0005$). Canadian midwifery clients ($n=56$) were more likely to receive the Group B Streptococcus screen ($p=0.004$) than their U.S. counterparts. In addition, the mean number of ultrasounds performed during pregnancy was significantly higher for U.S. women than Canadian women ($p=0.001$). Women with any post-secondary education were more likely to choose to have the glucose screen ($p=0.017$) and primiparous women were more likely to have an ultrasound ($p=0.020$) and the glucose screen ($p=0.038$). Factors that may influence which tests women receive are discussed in relation to the philosophic framework of midwifery practice in Canada and the U.S.

KEY WORDS

midwifery, midwives, practice guidelines, antepartal care, prenatal care, prenatal screening, informed choice, informed consent

THIS ARTICLE HAS BEEN PEER-REVIEWED

INTRODUCTION

Prenatal screening and testing is a common occurrence in midwifery practices in both Canada and the United States (U.S.). Sound evidence-based practice and consideration of criteria that include client and broader public health perspectives is necessary to determine the best practice in the delivery of prenatal screening. The aim of prenatal screening, from a clinical perspective, is to identify the fetus at risk for a particular condition in order for a diagnostic test to be offered. If the fetus is found to be affected, the woman and family may then consider options for either continuing or terminating the pregnancy. Significant advances have been made in diagnosing many disorders and anomalies in utero. Technological advances, however, do not come without costs, both to the expectant woman and family and to the health care system. Whether women choose to have these tests or not and how these decisions are made is of utmost importance to midwives.

Both Canadian and American midwives use written recommendations and/or guidelines when providing information about prenatal screening tests to their clients.^{1,3} They are influenced by personal and professional philosophies, best evidence, the recommendations of professional organizations, their respective health care systems, and community practice standards. The midwife has an ethical duty to educate clients about all of the risks and benefits inherent in each of the screening tests. Press and Browner investigated why women say

“yes” to prenatal diagnosis and found that the best predictor of women's level of test acceptance was strong institutional or provider support for the test.⁴ Their study also demonstrated how the provider's influence shaped women's understanding of the meaning and purpose of the screening.

Provider support for testing may be related to the philosophical principles guiding midwifery practice.^{5,6} The impetus for this investigation arose from the first author's experiences and observations as a practicing midwife in both the Canadian and United States health care systems and, specifically, from the differences noted in the philosophical underpinnings of care provided by midwives in each country. Canadian midwifery's philosophy of care stresses the concept of informed choice throughout the childbearing cycle. Informed choice policies state, “women have the right to receive information and be involved in the decision-making process throughout their midwifery care” and “...the childbearing woman is recognized as the primary decision-maker”.⁷ The interactive process of informed choice involves the promotion of shared responsibility between the midwife and her client. The American College of Nurse-Midwives (ACNM) Code of Ethics, which guides midwifery practice in the U.S., cites a similar but slightly different hallmark.⁸ It states “nurse-midwives share professional information with their clients that leads to informed participation and consent. This sharing is done without coercion or deception.” The manner in which midwives provide care to their clients is influenced by both

their personal and professional philosophy of care. Their philosophy is operationalized in the amount of information women receive and the woman's level of comfort being the primary decision-maker in the process of care.

Several studies have noted differences in the amount of information women received as related to their class, education and socioeconomic background.^{9,10} In a disturbing finding, differences in information delivery and information perception were noted between public and private clients.¹¹ The current research also investigates the influence of select demographic variables on women who received the prenatal screening tests.

The question the authors chose to explore in this study was: what are the differences between screening tests received during prenatal care in Canadian and American midwifery clients? This study focused on the five prenatal screening tests that pregnant women are offered that often pose decision-making dilemmas for both clients and counseling midwives. The screening tests evaluated were: 1) genetic screening, which included maternal serum alpha-fetoprotein (MSAFP), or triple- or quad-maternal serum screens, 2) ultrasound (including all obstetrical ultrasounds received as recorded on their antenatal record), 3) HIV, 4) gestational diabetes, and 5) Group B Strep.

METHODS

A convenience sample of midwifery practices in Canada and the U.S. were invited to participate in the study. Practices from urban, suburban, and rural settings in both the U.S. and Canada were chosen based on comparable characteristics such as a similar number of midwives in each practice and similar numbers of clients seen per month and births attended per year.

One midwife in each practice completed the study questionnaires on practice information and client demographic characteristics and prenatal tests received. The charts of the last 20 clients who gave birth in the practice were reviewed in order to obtain the information on demographic characteristics and to determine which of the five antenatal screening tests of interest were recorded. Criteria for inclusion in the study were: 1) all antepartum care was provided by Registered Midwives (RM) or Certified Nurse-Midwives/Certified Midwives (CNM/CM) and 2) the client was one of the last 20 to give birth in the midwifery practice. The University of Michigan's Institutional Review Board gave permission to conduct the study before data collection began. Data collection occurred over a three-month period from June 2001 to September 2001.

Data were analyzed using the Statistical Package for the Social Sciences (SPSS) with assistance from the University of Michigan's Center for Statistical Consultation and Research.¹² Frequencies were used in the analysis of the demographic variables, t-tests were used to compare sample means and chi-square analysis was used to compare categorical data within and between groups. Results were considered significant at the $p < .05$ level.

RESULTS

Settings

Seven midwifery practices participated in the study: four from

Canada and three from the U.S. Urban sites sampled were located in greater Toronto, Ontario and Los Angeles, California, suburban settings were in Victoria, British Columbia and Rochester, Minnesota, and rural settings selected included two sites in Manitoba, (Morden and St. Pierre), and one in Morehead, Kentucky. The Canadian practices ($n=4$) included two to five Registered Midwives in each site, with the midwives averaging approximately 5.1 births per midwife per month. The three U.S. practices ($n=3$) included two to four CNMs in each site who attended a mean of 4.8 births per midwife per month. In order to make each of the practice site categories (urban, suburban and rural) of equal size for statistical analysis, client data from the two small, rural Canadian sites were combined.

Sample

The total sample size consisted of 116 clients from Canada ($n=56$) and the United States ($n=60$). (See Table 1 for sample characteristics.) Clients' ages ranged from 19-46 years in Canada and 17-39 years in the U.S., with a mean of 30.4 and 25.8 years respectively. Canadian clients were significantly older as compared to the American clients ($p=.0001$). With regards to medical insurance coverage, 96.4% of Canadian clients were insured

TABLE 1: SAMPLE CHARACTERISTICS ($n=116$)

	Canada ($n=56$)	US ($n=60$)
	<u>Mean (SD) Range</u>	<u>Mean (SD) Range</u>
Age (years)	30.4 (5.52) 19-46	25.8 (6.04) 17-39
Parity	2.4 (1.51) 1-8	2.2 (1.54) 1-7
	<u>n (%)</u>	<u>n (%)</u>
Clients with partners	55 (98.2%)	57 (94.7%)
Ethnicity		
Caucasian	52 (92.9%)	38 (63.3%)
Asian	2 (3.6%)	2 (3.3%)
Hispanic	1 (1.8%)	15 (25.0%)
Black	0.0	3 (5.0%)
Pakistani	0.0	1 (1.7%)
Middle Eastern	0.0	1 (1.7%)
Missing	(1.8%)	
Education		
Below high school	2 (3.6%)	17 (28.3%)
Graduated high school	19 (33.9%)	12 (20.0%)
Any post-secondary	33 (61.2%)	31 (51.7%)
Missing	2 (3.6%)	
Religious Preference		
Protestant	13 (23.2%)	21 (35.0%)
Catholic	1 (1.8%)	5 (8.3%)
Jewish	1 (1.8%)	0.0
Seventh Day Adventist	1 (1.8%)	0.0
Muslim	0.0	4 (6.7%)
Non-denominational	0.0	1 (1.7%)
Other	1 (1.8%)	1 (1.7%)
Missing	39 (69.6%)	28 (46.7%)

through their provincial health care plan and 65% of American clients were covered by Medicaid, with the remaining 35% privately insured. The difference between the client's ethnic backgrounds in the two countries was statistically significant ($p=.002$). Canadian clients were 94.5% Caucasian, 3.6% Asian, and 1.8% Hispanic descent. American midwifery clients were 63.3% Caucasian, 3.3% Asian, and 25% Hispanic descent. No other demographic characteristics were statistically significant when comparing Canadian and American midwifery clients.

Prenatal Screening Tests: Midwifery Practice Routines

Canadian midwifery practices reported that they routinely offer all women the genetic screen, glucose screen for gestational diabetes and Group B Strep swabbing. (100%; $n=4$). However only 75% ($n=3$) of the practices routinely offered HIV testing and ultrasound to women. All of the American midwifery practices ($n=3$) reported routinely offering women genetic, glucose and HIV screens and only 66% ($n=2$) routinely offered Group B Strep and ultrasound.

Relationship between Demographic Characteristics and Prenatal Tests

For the total sample ($n=116$), women with any post-secondary education were more likely to receive the glucose screen ($p=.017$) and primiparous women were more likely to have both an ultrasound ($p=.020$) and the glucose screen ($p=.038$). Within country analysis revealed that Canadian women who were greater than 30 years old were more likely to have the genetic screening test ($p=.025$), and those with some post-secondary education were more likely to have the glucose screen ($p=.003$). Women in the U.S. with any post-secondary education were more likely to have the genetic screen ($p=.040$). In American women, however, maternal age was not significantly correlated with choosing to have either the genetic screen or any of the other screening tests.

In sum, demographic data revealed that the Canadian and American clients in the study sample were not entirely equivalent, with statistically significant differences found in ethnicity and age of the clients. Some demographic characteristics were associated with whether women had prenatal screening tests. For example, college educated women were more likely to have the glucose screening test and primiparous women more likely to have both the glucose screening test and ultrasound. Within the respective countries there were also significant differences, with older Canadian women more likely to have genetic screening and Canadian women with any post-secondary education more likely to have glucose screening. American women with any post-secondary education were more likely to receive genetic screening.

Prenatal Screening Tests: Comparing Women in Canada and the United States

When compared to Canadian women, American women were more likely to have four of the five prenatal screening tests performed during their pregnancies (Table 2). More American midwifery clients had genetic screening, HIV, ultrasound and glucose screening tests compared to Canadian women. Canadian midwifery clients were more likely to receive the Group B Strep screen than their U.S. counterparts. In addition, the mean number of ultrasounds performed during pregnancy was significantly

higher ($p=.001$) for American women (mean 1.67, $SD=0.82$) than Canadian women (mean 1.08, $SD=0.97$).

Midwifery Practice Differences within the Canadian and U.S. Practices

When compared to each other, the urban, suburban and rural midwifery practice sites within the respective countries were not homogeneous. The data from the Canadian practices (when compared to each other) demonstrated statistically significant differences regarding whether women received an ultrasound, HIV, and glucose screening tests (Table 3). A similar comparison of the urban, suburban and rural American practices also revealed statistically significant differences between women who received genetic screening, HIV and Group B Strep tests.

DISCUSSION

This study on prenatal screening tests focused on women who received these tests in midwifery practices with similar characteristics in Canada and the United States. Although the practices were similar in terms of births attended and number of midwives, there were differences in the demographics of the clients. The mean age of Canadian clients in this study was greater by 4.6 years. Ethnicity of midwifery clients was not reflective of the overall national number of foreign-born citizens in either country. The American midwifery clients in the sample were significantly more diverse than the Canadian clients. As was anticipated, more Canadian clients were insured through publicly funded health care plans compared to American clients.

Barrett and Pittman caution women regarding the implications of positive genetic screening test results (8%), and encourage them to obtain information from their health care provider, childbirth educators, Internet resources or genetic counselors.¹³ This study's findings indicated a 20% difference between Canadian clients (25.5%) and their American counterparts (45%) regarding who received genetic screening (Table 2). This is of particular interest given that, although fewer Canadian women chose to have this genetic screen, they were a significantly older than the American women and might, therefore, be more inclined to choose this test. Data were not collected for this project on whether these women may have opted for an amniocentesis or chorionic villus sampling rather than the genetic screen.

TABLE 2: NUMBER OF WOMEN HAVING PRENATAL SCREENING TESTS BY COUNTRY

Test	Canadian Women ($n=56$) n (%)	U.S. Women ($n=60$) n (%)	Significance Level
Genetic screening *	14 (25.5%)	27 (45%)	$p=0.029$
HIV †	29 (51.8%)	51 (85%)	$p=0.0001$
Ultrasound	40 (71.4%)	58 (98.3%)	$p=0.0001$
Glucose screening	31 (64.6%)	59 (98.3%)	$p=0.0001$
Group B Strep	43 (78.2)	31 (52.5%)	$p=0.004$

* Maternal Serum Alpha Fetal Protein

† Human immunodeficiency virus

Whether or not clients received an obstetric ultrasound varied widely (Table 2). Of interest was the finding that while neither Canadian nor American midwifery practices reported doing routine ultrasound screening, the majority of women in both countries received an ultrasound at some point during their pregnancy. About three-quarters of the Canadian practices stated that an ultrasound was routinely offered and about three-quarters of Canadian women received an ultrasound (71.4%), whether routine or for a specific indication. Almost all (98.3%) American women received an ultrasound, although only two-thirds of the American practices reported routinely offering this test. This difference may be due to several factors, including each country's approach to technology and what information clients are seeking from the procedure.

In Canada, one of every 2000 women is HIV positive and in the United States women are the fastest growing subpopulation of persons with AIDS.^{14,15} Women in this study demonstrated opposing national trends in the desire to receive their HIV status. Slightly over half of Canadian women received the HIV test (51.8%) which is consistent with the finding that it was routinely offered in three of the four practices. Significantly more American women, 85%, were tested for their HIV status (Table 2), consistent with the finding that it was routinely offered in all of the U.S. practices. Medical climates and literature may again offer insight into this discrepancy. Canadian information disseminated to women states "the potential benefits are so great that health experts...recommend that all pregnant women be tested for the virus" while U.S. publications state more forcefully that "all pregnant women should be tested for HIV prior to pregnancy or as early in pregnancy as possible."^{14,16}

Gestational diabetes mellitus (GDM) is present in three to six percent of all pregnancies in the U.S.¹⁷ Only about two-thirds of Canadian midwifery clients received glucose screening (64.3%) even though it was routinely offered in all the midwifery practices studied in both Canada and the U.S. The majority of the American clients received the glucose screen (98.3%) (Table 2). Once again, each country's resource literature may provide clues to this difference. Canadian midwifery practices have been proactive, providing clients with information specifically oriented to attaining euglycemia, using language in midwifery guidelines that suggests offering screens to women at risk, and by steadfastly supporting evidence from the Cochrane Perinatal Database and Enkin et al.^{18,20} Enkin concludes that there is "no evidence to support the wide recommendation that all pregnant women should be screened for diabetes mellitus." More harm than good can be done by placing labels on a woman, which leads to more medical interventions of unproven benefit. Inherent in the midwives' watchful and conservative approach to guidance is the ever-present principle of client empowerment. Not labeling a woman as "sick" or "at risk" allows her the flexibility to be in control of her pregnancy.

In contrast, Avery from the U.S. uses data from the third international workshop on gestational diabetes to support the recommendation that "most women in the United States are of average risk and should be screened at 24-28 weeks of gestation."²¹ Carr goes further using the Joint Fourth International Workshop Conference on GDM and the American Diabetes Association to support her statement that "screening for GDM has become a standard in maternity care practice despite the lack of clear evidence to support routine use."¹⁷ It should be noted that, in general, American CNMs/CMs care for clients with higher GDM risks, such as Hispanics and a higher number of women classified as obese.²²

TABLE 3: NUMBER OF WOMEN HAVING PRENATAL TESTS BY PRACTICE SETTING

Canada (n=56)			
	URBAN	SUBURBAN	RURAL
Test	Site 4 (n=19) n (%)	Site 5 (n=20) n (%)	Site 6 and 7 (n=17) n (%)
Genetic screen	7 (36.8%)	6 (31.6%)	1 (5.9%)
HIV*	13 (75%)	15 (75%)	1 (5.9%)
Ultrasound*	11 (73.7%)	20 (100%)	6 (35.3%)
Glucose*	14 (64.7%)	13 (92.9%)	7 (41.2%)
Group B Strep	15 (78.9%)	17 (89.5%)	11 (64.7%)
U.S. (n=60)			
	URBAN	SUBURBAN	RURAL
Test	Site 1 (n=20) n (%)	Site 2 (n=20) n (%)	Site 3 (n=20) n (%)
Genetic screen*	19 (95%)	6 (30%)	10 (2%)
HIV*	19 (95%)	12 (60%)	20 (100%)
Ultrasound	20 (100%)	18 (94.7%)	20 (100%)
Glucose	19 (95%)	20 (100%)	20 (100%)
Group B Strep*	0 (0%)	17 (89.5%)	14 (70%)

*Statistically significant at $p < .05$ within country group

Of the five tests examined in this study, the one that Canadians received more often than American women was the Group B Strep screen. Over three-quarters of Canadian clients (76.8%) received screening for Group B Strep (GBS), while only slightly over half (52.5%) of the U.S. women received GBS screening (Table 2). Many Canadian midwifery practices offer both an obstetric risk factor approach and a culture-based approach to third trimester Group B Strep screening. In the U.S., during the time this study was conducted, both culture-based and obstetrical risk factor approaches were offered, as endorsed by the Centers for Disease Control and Prevention. In this study, 66.7% of U.S. midwives used the culture-based approach and only two of the three practices offered routine screening.²³ Given the recent U.S. change to a culture-based approach, it is certain that the number of American women who receive this prenatal screen will rise in the future.

While it is not known from these data how women's decisions were made, the practical application of informed choice versus informed consent concepts are important to ponder in light of the influence that

providers have on women's decision-making.⁴ In Canadian midwifery practices, informed choice is defined as a "shared responsibility between midwife and client, [it is] interactive, non-authoritarian, and includes what is known and unknown about tests, procedures, and medications" and always maintains the "woman as primary decision-maker."⁷ The importance of respecting cultural differences is also stressed.²⁴ When this model was studied, it revealed Canadian midwifery clients had longer prenatal visits and their care was perceived (by the clients) to be more personalized than with other types of maternity care providers.²⁵ In American midwifery practices, principles of informed consent are more likely to be followed. Midwives define this process as "an ongoing negotiation process in order to develop a safe plan of care," which takes into consideration cultural diversity, individual autonomy, and legal responsibilities.⁸ A key difference between informed consent and informed choice is that informed consent does not go as far as informed choice in acknowledging the woman as the primary player in these "negotiations". Additionally, Canadian midwives may be less likely to feel the necessity of including their legal system as a major stakeholder within midwife/client discussions. For clients to be best served, midwives need to feel free to disclose all known benefits, risks, and unknown outcomes of prenatal screenings while supporting the woman's desired level of participation and her right to self-determination.

Another important factor that may affect women's choices is the difference between a primarily "opt-in" system of screening in which women request, rather than decline, screening tests (such as Canada), and an "opt-out" system (such as the U.S.), which applies when tests are performed routinely. This study's findings were consistent with others that have studied prenatal screening tests in "opt-in" and "opt-out" health care systems.^{11,26,27} Women in the American "opt-out" system received four of the five screening tests more often than women in the Canadian "opt-in" system. Studies on prenatal screening suggest that a pregnant woman's perception that a test is routine or benign has implications for compliance with, and acceptance of, the screening program.^{26,27} Studies have also suggested that lack of information in an "opt-in" system was associated with low use of prenatal screening.^{28,29} Not surprisingly, one study also demonstrated that lack of information in an "opt-out" system was associated with high use of screening.¹¹ Until this current study, no studies have examined which women received the prenatal screening tests when cared for by midwives in a primarily "opt-in" (Canada) versus "opt-out" (U.S.) health care system.

LIMITATIONS

This beginning, exploratory look at Canadian and American midwifery prenatal screening test practice routines and which women received these tests is insightful but also limited in several ways. The small, convenience sample of clients and the small number of midwifery practices limit the generalizability of the findings. However, the diversity of the sample and practice settings may present a representative sample of midwifery clientele from each county and a beginning point from which to build additional research studies. One significant difference was in the number of Hispanic women participants. A limitation of the study is that it is not conclusively known if the Canadian practices

differentiated Hispanic from Caucasian when recording client information.

The prenatal screening tests that women decide to receive may be influenced by many factors such as the midwives' practice routines and guidelines, insurance issues, the legal climate, community standards, professional organization recommendations, and the perceived threat of adverse health events. Data were not collected on all of these potentially influencing variables in this pilot study. Our data does not provide evidence on how women's decisions were made nor on all of the factors that may have influenced their decisions. In addition, it is not known whether, when a test was not done, it was the woman's decision or whether the test was not offered. Data were collected on midwifery practice routines concerning which tests were offered routinely. However it is not known whether every midwife complied with the practice routines. In cases where the test was done, it is not known from our data whether this was due to the influence of the different philosophies of informed choice versus informed consent or other factors.

IMPLICATIONS FOR PRACTICE

The findings from this study open the door for further transnational research within the midwifery community. Larger scale and more diverse longitudinal studies that incorporate variables influencing women's decisions would enhance midwives provision of safe, unbiased, and ethical client counseling. Clients' cultural, religious, and educational components have a profound influence on any midwife/client discussions about prenatal testing and further investigative findings would lead to useful counseling strategies.

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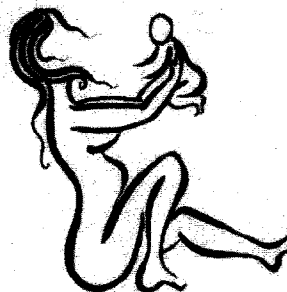
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