



Research Article

The Information Needs of Canadian Midwives and Their Evidence Informed Practices: A Canada-Wide Survey

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Abstract

Objective – The study aim was to understand the extent to which Canadian registered midwives have access to and make use of clinically relevant information for evidence based midwifery practice.

Methods – A survey instrument was created consisting of 17 multiple choice, matrix table, and short answer questions and distributed to 1,690 recipients on the Canadian Association of Midwives email list in fall 2018. In total, 193 responses were included in the analysis.

Results – One third of midwives do not have library memberships. Midwives reported that limited access to clinically relevant information is a key challenge in applying information in practice. Midwives with library memberships reported more frequent use of high-quality information while midwives without memberships reported more frequent use of websites. Midwives with advanced degrees (graduate, PhDs) were more likely to be high-frequency information users and rank themselves higher on evidence based competency scales than their undergraduate-holding colleagues. Clinical practice guidelines were important information sources and used frequently by midwives.

Conclusion – Midwives reported low levels of academic or hospital library memberships and yet used information frequently. Clinical practice guidelines support the work of midwives but are inaccessible to some due to paywalls. Midwives lacked confidence in evidence based practice and reported critical appraisal as an area for development. Solutions to these problems could be addressed at the hospital, health authority, provincial, or national association level, or within midwifery departments at Canadian universities. Hospital and academic libraries should prioritize the information needs of students and practicing midwives and identify ways to foster use of library resources through administrative or educational interventions.

Introduction

Midwives in Canada are autonomous care providers who provide evidence based care for their clients throughout pregnancy, birth, postpartum, and the newborn period. Midwives hold a high degree of professional responsibility and accountability and must abide by guidelines and standards appropriate to the clinical context (Ontario Medical Association & Association of Ontario Midwives, 2005). According to the Canadian Association of Midwives (CAM) (2015), “Midwifery practice is informed by research, evidence-based guidelines, clinical experience, and the unique values and needs of those in their care” (p. 2). This approach aligns

with evidence based medicine (EBM), defined by Guyatt, Rennie, Meade, and Cook (2008) as an approach to patient care that uses best evidence to guide decision making and emphasizes the importance of patient values and preferences.

Canadian midwives routinely integrate discussions about risk from the literature into their conversations with clients (Van Wagner, 2016); further, midwives must maintain their knowledge and clinical skills to ensure clients are treated according to current best evidence (College of Midwives of Ontario, 2018). Research on the information behaviour and evidence based practice (EBP) of Canadian

midwives is lacking; however, a growing number of international studies of midwives and nursing professionals point to a gap between high level commitments to EBP and the actual practice of it (Spenceley, O’Leary, Chizawsky, Ross, & Estabrooks, 2008; De Leo, Bayes, Geraghty & Butt, 2019). This is a serious issue, as noted by De Leo et al. (2019): “The evidence-to-practice gap in maternity services remains a global issue for midwives and demands prompt action from both knowledge producers and knowledge users” (p. 4,234).

A recurring theme in this literature is the importance of ease-of-information-access on practice. Canadian midwives are expected to practice evidence based midwifery; however, the extent to which midwives use and access sources of evidence—such as those found through systematic reviews, original articles, or databases—is unknown. As autonomous care providers, midwives have a great need to stay up to date; however, midwifery associations do not operate libraries for their members. This contrasts with other professional groups, such as the Canadian Nurses Association and the College of Family Physicians of Canada, which have created digital or physical libraries to provide members with access to current, clinically relevant literature. While many summaries of the literature are freely available online, key guidelines, policy statements, and committee opinions from the Society of Obstetricians and Gynecologists of Canada (SOGC) are published in the *Journal of Obstetrics and Gynecology of Canada* which is accessible only to members of the SOGC by subscription. To understand the extent to which midwives are able to satisfy their need for clinically relevant information, we conducted a survey focused on the types of information sources midwives prefer and their proficiency with and views about evidence based practice given the dominant medical model of childbirth in Canada. The aim was to examine cross-Canada access to and use of evidence based information by midwives.

Literature Review

Midwifery Practice in Canada

The professionalization and regulation of midwifery in Canada developed out of the women’s movement of the 1970s to offer an alternative to the medicalization of pregnancy and childbirth (Parry, 2008). The Canadian midwifery model of care is based on principles of professional autonomy, continuity of care, informed choice, choice of birth place, collaborative care, and evidence based practice (Canadian Association of Midwives, 2015). In this model, a midwife is a responsible and autonomous community-based provider working in partnership with women and their families to balance patient values with community standards of practice and current best evidence (College of Midwives of Ontario, 2018).

Midwifery Education Programs (MEPs) in Canada are direct-entry, four-year undergraduate degrees leading to a Bachelor of Midwifery or Bachelor of Health Sciences. There are “bridging” or “pre-registration” midwifery programs for internationally educated midwives who seek to practice in Canada (College of Midwives of British Columbia, n.d.). During their time as students, midwives have access to library databases and electronic resources through their universities. Upon completion of their programs of study, their access to university library collections ends or is restricted to alumni privileges or library walk-in access.

Funding models for midwifery practice vary by province and territory, but most midwives work as independent contractors under a fee-for-service agreement with their home province (British Columbia, Alberta, and Ontario) or under a salaried model (Manitoba, Saskatchewan, the Northwest Territories and Quebec). While no studies have been conducted on the advantages of each model with respect to library access or use of clinically relevant information, under the fee-for-service model

“midwives have greater flexibility and fewer bureaucratic barriers to establishing midwifery practice in diverse geographic settings” (Thiessen, Haworth-Brockman, Nurmi, Demczuk, & Sibley, 2018, p. 7). Fee-for-service encourages the establishment of midwifery practices at a distance from hospitals and their onsite libraries and professional networks. In comparison to other jurisdictions, such as the U.K. and Australia, midwives practicing in Canada experience a greater degree of autonomy and a greater responsibility to proactively consult and collaborate with other health professionals (Mallot et al., 2009).

Information Seeking and Evidence Based Practice

Two studies offer useful conceptual frameworks for this project. Leckie, Pettigrew, and Sylvain (1996) proposed a model of the information seeking of professionals, taking into account their roles, tasks, and information needs. As primary care providers, midwives’ roles overlap with both physicians and nurses, indicating a broad range of information needs. The model identifies certain constants across professional groups, including the importance of information access, and it points to a high degree of complexity in professional work settings, which leads to variability and unpredictability in information seeking (Leckie et al., 1996). The second model (Spenceley et al., 2008) identifies a range of factors that shape information seeking activity and outcomes in evidence based nursing practice: the context of practice, which includes aspects of the individual practitioner (e.g., education, skills, attitudes), the work setting (e.g., training, information resources); the sources of information, which have attributes, such as availability and trustworthiness; and a number of mediating factors such as time pressures, the expectations of others, and situational barriers. Notable themes include the constraints of time and access to information on the search process, the need for administrative support for EBP, and the preference for trusted interpersonal sources of information (Spenceley

et al., 2008). Both frameworks situate information practices in context and highlight the awareness of and access to a range of sources for diverse tasks in complex work settings.

Although studies of information seeking and EBP of Canadian midwives are lacking, studies of midwives and nurses from the U.K. and Australia indicate that EBP is consistent with the philosophy of midwifery and is valued by practitioners (Bayes, Juggins, Whitehead & De Leo, 2019; De Leo et al., 2019; Fairbrother, Cashin, Conway, Symes, & Graham, 2016; Toohill, Sidebothan, Gamble, Fenwick, & Creedy, 2017; Veeremah, 2016). Notably, EBP has been recognized by midwives as a means to reduce the medicalization of pregnancy and birth, including the overuse of interventions (De Leo et al., 2019; Kennedy, Doig, Hackley, Leslie & Tillman, 2012; Miller et al., 2016). At the same time, there is considerable evidence that midwifery care is not always reflective of EBP guidelines, raising questions as to the reasons for this gap (Bayes et al., 2019; De Leo et al., 2019; Fairbrother et al., 2016; Toohill et al., 2017).

A recent integrative review of midwives’ EBP sought to investigate this issue through close examination of six studies, several of which included both nurses and midwives (De Leo et al., 2019). The authors identified a number of themes. Practitioners are aware of EBP and confident with their skills; however, published information sources are underused, with practices based more on convention and information gained from patients and other professionals (Bayes et al., 2019; Fairbrother et al., 2016; Heydari et al., 2014). For example, in a survey of 297 Australian midwives to evaluate the uptake of evidence based guidelines on normal birth, Toohill et al. (2017) found that almost all respondents were familiar with the guidelines, but only 71% routinely used them. Three barriers to EBP implementation are widely identified: a lack of time to find and use evidence based resources (Bayes et al., 2019; Fairbrother et al., 2016; Toohill et al., 2017;

Veeramah, 2016); organizational barriers, such as resistance to change, lack of support from colleagues, and structural impediments (Bayes et al., 2019; Heydari et al., 2014; Toohill et al., 2017; Veeramah, 2016); and limited access to information and computers in the workplace (Fairbrother et al., 2016; Toohill et al.; 2017; Veeramah, 2016).

Information Literacy and Skills Training

Training medical practitioners to search and appraise high-quality evidence has long been recognized as an important factor in the provision of patient care (Guyatt, Meade, Jaeschke, Cook, & Haynes, 2000). Informed clinicians are able to assess their own knowledge gaps and formulate effective research questions (McKibbin, Wyer, Jaeschke, & Hunt, 2008). Lack of access to libraries has been identified as an obstacle to developing these skills among physicians (Coumou & Meijman, 2006). In an early survey of the information needs of 1,715 U.K. nursing professionals, including midwives, Bertulis and Cheeseborough (2008) found that lack of training in information seeking was an obstacle to applying evidence in practice. More recent research continues to identify education and training gaps (e.g. Veeramah, 2016) and the need for capacity building among nurses and midwives (Fairbrother et al., 2016), although there is evidence that EBP skills are rising over time. A survey of Australian nurses and midwives found higher self-reported expertise compared to earlier studies conducted in the U.K. and Australia (Fairbrother et al., 2016). However, less than 40% of respondents considered themselves competent or expert at finding research evidence or using the library to locate information. Rates of Internet competency were higher, at 63%, a finding supported by additional research on Australian midwives (McKenna & McLelland, 2011).

Longstanding information practices, including source preferences, also impact EBP. Ebenezer

(2015) reviewed the literature on the information behaviour of nurses and midwives between 1998 and 2014 and identified a strong preference for gaining information through human sources. This preference for what Estabrooks et al. (2005) terms “interactive” and “experiential” sources of information over formal or “documentary” sources (p. 471) is one of the most frequent findings in studies of information seeking of nursing and midwives (Bertulis & Cheeseborough, 2008; De Leo et al., 2019; Ebenezer, 2015; Fairbrother et al., 2016; Ricks & Ham, 2015; Thompson et al., 2001b). Interestingly, this preference for social information sources does not seem to extend to social media. Dalton et al. (2014) conducted a mixed methods study of information communication technology use among Australian midwives and found a high degree of consensus that social media is an inappropriate and high-risk means of sharing information in a healthcare context.

Use of pre-appraised evidence, such as practice guidelines, systematic reviews, and computer decision support systems, continues to impact the quality of clinical decision making. Guyatt, Mead, Jaeschke, Cook, and Haynes (2000) noted the critical importance of pre-appraised evidence for clinicians and observed that, while not technically practicing evidence based care, the clinical trainees whom they studied acquired a “restricted set of skills” which included the ability to track down and use secondary sources of pre-appraised evidence (p. 955). Lafuente-Lafuente et al. (2019) found that health practitioners used primary evidence infrequently which “suggests that many professionals probably do not (or are unable to) verify independently, by their own means, the validity of what is stated in guidelines, or otherwise what is presented to them as ‘EBM-based’” (2019, p. 5). This is supported by the work of Fairbrother et al. (2016), which found that articles published in research, nursing, and medical journals were the least frequently used sources of information in practice.

Summary

The gap between EBP commitments and reliance upon evidence in every day practice is widely documented among midwives and the nursing professionals more generally. This situation persists across the diverse national contexts and workplace settings in which midwives practice. Relevant models of information seeking stress the complex and situated nature of the work of health professionals, in which the roles, tasks, information sources, and work environments significantly shape and constrain practices. A broad, but generally consistent, set of barriers to EBP in midwifery have been identified in studies conducted outside Canada. Among these, access to resources, EBP literacies and skills, and longstanding information practices are key. Other factors also emerge as important, notably time, organizational culture, and receptivity to change. Canadian midwives operate with more autonomy than their colleagues in the U.K. and Australia, where the majority of studies have been conducted, which suggests that these findings may not generalize to the Canadian context.

Aims

Rather than examining the full range of factors known to shape EBP, the current study focuses on access to libraries and information, source use, and EBP literacies in the Canadian context, as a first step towards understanding the local situation and constraints upon EBP. A survey was designed to investigate the extent to which Canadian registered midwives had access to and made use of clinically relevant information in practice. The research questions were: How frequently do Canadian midwives use published information and which sources do they prefer? What challenges do they encounter in accessing and using information? How do they acquire the information literacy skills needed to find and apply clinical information and are those skills well-developed? To provide a more nuanced picture of the *status quo*, we

compare responses across several factors, including region, work conditions and settings, and access to libraries.

Methods

Survey Design

The survey instrument (see Appendix) was developed iteratively by soliciting feedback from library and midwife professionals. The range and types of questions were developed by using the Association of College & Research Libraries' "Information Literacy Competency Standards for Nursing" (Association of College and Research Libraries, 2013). The frameworks of Leckie et al. (1996) and Spenceley et al. (2008) indicated the importance of collecting contextual data on demographics, specialization, career stage, and other factors likely to influence information behaviour. An early version of the questionnaire was piloted with two registered midwives, both educators, and a health librarian from British Columbia, Canada. The final version incorporated feedback from the pilot sessions.

The questionnaire begins by asking for demographic data to establish the personal and practice context (Q1-6). The next set of questions (Q7-10) focuses on general access and use of information, including library memberships and frequency of use of information. Q11 asks about information source types and use frequency. The list of information sources was derived from the work of McKibbon et al. (2008). These categories were not explicitly defined in the questionnaire, but were presented with illustrative examples, as follows:

- Summaries (clinical practice guidelines and systematic reviews)
- Textbook-like e-resources (UpToDate, AccessMedicine)
- Studies (original research articles)
- Print books (monographs, textbooks)
- Apps

- Popular websites (WebMD, Mayo Clinic)
- Social media (Twitter)

Q12 asks participants to rate challenges in applying clinically relevant information, with a focus on access and literacy skills. The final set of questions (Q14-16) ask about information literacy training and competencies. Q14 asks participants to report on their level of expertise in EBP using a five-point scale ranging from novice to expert, across four categories of EBP competencies (Q14). Using this data, we calculated an aggregate metric of EBP competency using the sum of the responses across the four areas converted to a score out of 10 for ease of interpretation, such that an expert level of competency across all areas received a top score of 10. This metric allowed us to compare self-reported EBP competency levels across groups.

The study received approval from the Behavioural Research Ethics Board at the University of British Columbia. The questionnaire was implemented and distributed online using the Qualtrics platform.

Study Responses and Recruiting

Survey responses were collected during the fall of 2018. The study population was registered midwives in Canada, of which there were 1,690 at the time of the study (Canadian Association of Midwives, 2018). CAM is the national body representing midwives and it collects and maintains a database of registered midwives using data from provincial and territorial associations and colleges. All registered midwives in the database ($n = 1,690$) received an invitation from CAM to participate. To encourage further participation, we distributed invitations through the Midwives Association of British Columbia's email list and the Canadian Registered Midwives Facebook group, which served as reminders or reinforcements. No compensation was provided for completing the questionnaire, which took, on average, five to 10

minutes. In total, 218 midwives participated in the survey, representing a 12.8% response rate. Of the 218 questionnaires submitted, 25 were found to be substantially incomplete and were removed, leaving 193 questionnaires for analysis.

Responses were received from eight provinces and one territory, but most respondents were from Ontario (40%) and British Columbia (BC, 39%), followed by Alberta (8%) and Quebec (6%). The mean number of years of respondents' midwifery practice was nine, with responses ranging from zero to 40 years. The educational profile of respondents included 67% ($n = 130$) holding a Bachelor degree, 23% ($n = 44$) Master's degree, and 4% ($n = 7$) PhD. A small number held other credentials. A majority of respondents (71%, $n = 137$) were practicing full time with 17% ($n = 32$), practicing part time, 7% ($n = 13$) non-practicing, many of whom were educators, and 6% ($n = 11$) reporting some other status, including those on temporary leaves. We reviewed the responses from the last two categories and determined that these responses were valid for our purposes, as these were experienced midwives, whose responses were consistent with the broader sample.

Table 1 summarizes the distribution of responses by province and work setting. The majority (68%, $n = 131$) of respondents were practicing in an urban or suburban setting, while 26% ($n = 51$) were rural and 6% ($n = 11$) remote. These categories were provided to participants without definitions, and so were subject to interpretation. Given the low number of responses from most provinces, we report comparisons by province only for BC and Ontario in this report. The BC-Ontario comparisons are not meant to be representative of conditions across Canada and are not generalizable. Rather, the data analysis is descriptive in nature and is meant to provide a starting point for examination and further research.

Table 1
Distribution of Responses by Region and Work Setting

	Urban	Suburban	Rural	Remote	Total
Alberta	11	3	2		16 (8%)
British Columbia	36	10	24	3	73 (38%)
Manitoba	3				3 (2%)
New Brunswick	1				1 (1%)
NW Territories				1	1 (1%)
Nova Scotia	1		2		3 (2%)
Ontario	36	19	20	3	78 (40%)
Quebec	4	3	2	3	12 (6%)
Saskatchewan	1				1 (1%)
Multiple provinces	2		1		3 (2%)
Other		1		1	2 (1%)
Grand total	95 (49%)	36 (19%)	51 (26%)	11 (6%)	193

Results

Library Membership

We asked participants if they held membership in an academic or hospital library, based on the assumption that library privileges, such as access to bibliographic databases and electronic resources, require library membership. Figure 1 summarizes responses. Overall, 67% ($n = 129$) of respondents reported some type of academic library membership and 33% ($n = 64$) reported having no library membership (or unsure). Of those who had membership, 53% ($n = 68$) had access through a university as a student, employee, or faculty member; 57% ($n = 74$) through a hospital; and 9% ($n = 12$) through a college or private library. Many had access through multiple avenues. Several respondents indicated in their comments that they held alumni library privileges, which were described as “limited” or due to expire one year after graduation. Others said they gained access to academic collections through use of their colleagues’ or partners’ passwords or via credentials gained through other professional associations. One respondent added the comment that “hospitals refuse midwives access.”

We compared the rates of library membership across different geographic regions. A higher percentage of respondents from BC (74%) reported having membership access compared to those from Ontario (65%). With respect to work setting (Figure 2), rates of library membership in urban work environments were highest at 72% followed by suburban at 69%, remote at 64%, and rural at 57%. Midwives with graduate degrees reported higher levels of library membership (78%) compared to those with undergraduate degrees (62%). There was no difference between those who reported working full time or part time. In a separate question, we asked if respondents used public libraries as a resource for their clinical information needs. This proved to be highly uncommon, with 96% of respondents indicating that they very rarely or never use public libraries to stay informed for practice.

Use of Clinically Relevant Information

Participants were asked how frequently they refer to clinically relevant information in their midwifery practices. The most common response was: frequently – several times a week (65%), followed by occasionally – a few times a month (18%), and very frequently – several

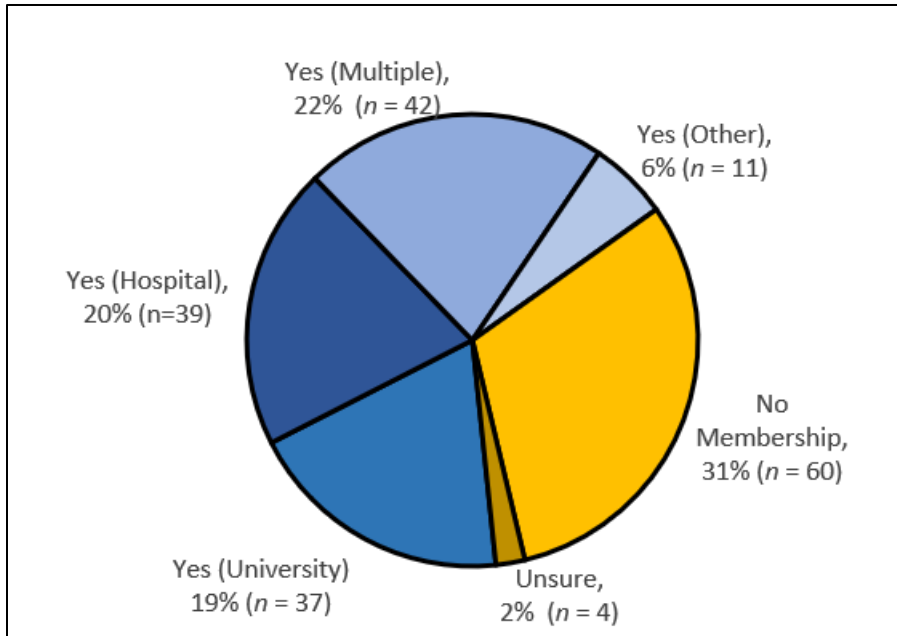


Figure 1
Library membership (academic or hospital libraries).



Figure 2
Library membership by work setting (percent).

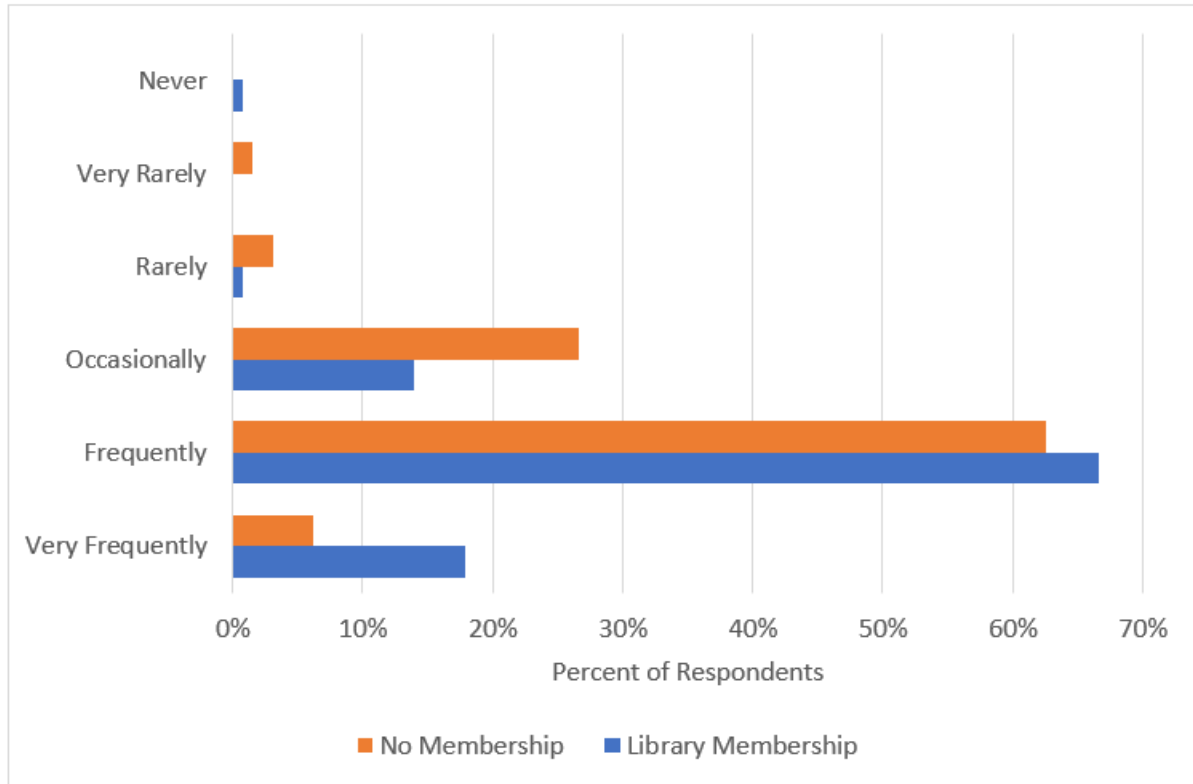


Figure 3
Comparison of information use frequency by library membership.

times a day (14%). Figure 3 compares the frequency of information usage by those with and without membership in an academic or hospital library. Not surprisingly, a higher percentage of those with access to a library reported using information at a high frequency, while those without access were more likely to use information occasionally, rarely, or very rarely.

Group comparisons were made based on high-frequency information usage (defined as the percentage of those who reported using information frequently or very frequently):

- 85% ($n = 62$) of respondents from BC were high-frequency users compared to 76% ($n = 59$) in Ontario;
- 85% ($n = 81$) of respondents in urban settings were high-frequency users compared with 72% ($n = 26$) in suburban,

73% ($n = 37$) in rural, and 82% ($n = 9$) in remote settings;

- 82% ($n = 113$) of respondents working full time were high-frequency users compared with 63% ($n = 40$) of those working part time;
- 88% ($n = 45$) of respondents with graduate degrees were high-frequency users compared with 77% ($n = 96$) of those with undergraduate degrees.

Participants were asked to report on their use of nine different types of information sources in terms of frequency. The results, presented in Figure 4 showing higher percentages in darker shading, indicate summaries and colleagues are used most frequently as information sources.

We were interested in the impact of library access on the types of information sources consulted. We focused our analysis on a subset

Information Sources	Very Frequently		Occasionally	Rarely	Never
	Frequently	Frequently			
Summaries: e.g., Clinical practice guidelines algorithms, systematic reviews	46	45	9	0	0
Colleagues: Consults with other health professionals	37	50	11	2	0
Textbook-like e-Resources: e.g., UpToDate, DynaMed	18	34	30	12	7
Manuals e.g. NRP, ALARM	14	36	44	7	0
Original research articles (primary studies)	10	31	44	14	2
Popular websites: e.g. WebMD, Mayo clinic	8	31	41	15	5
Print books e.g., monographs, textbooks	2	12	41	40	5
Apps	4	20	36	27	13
Social media: e.g., Facebook, Chat rooms	4	10	19	28	39

Figure 4
Heat map of information source frequency of use (percent).

Table 2
Comparison of Information Source Frequency of Use (Percent) by Library Membership (Yes/No)

Information Sources	Very Frequently		Frequently		Occasionally		Rarely		Never	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Summaries	48	40	44	48	8	12	0	0	0	0
Colleagues	40	31	51	48	8	17	2	3	0	0
Textbook-like e-resources	21	10	37	28	28	33	10	17	5	12
Original research articles	10	10	36	20	43	45	11	22	1	3
Popular websites	5	15	33	27	41	42	17	10	5	7

of all information source types, including those we thought would be most affected. The results, presented in Table 2, showed some interesting patterns. At the highest level of frequency, those without library access reported less frequent use of summaries, colleagues, and textbook-like e-resources and more use of websites than colleagues with library access. Research articles

were used less frequently by those without access, although this shows up in the frequent (lower) and rare (higher) use categories. Lack of membership did seem to influence resource use patterns, but it did not prevent most midwives from using a range of resource types on a regular basis.

Borrowed Library Access

In the final open-ended question in the survey, a number of responses raised concerns that midwives are forced to ask for help in accessing essential information. One midwife commented “I always meet my information needs by using online resources or by asking my senior student to use her online connection to university libraries to locate resources...” Another stated, “I don’t have other means of ‘official’ access but I frequently use a family member’s library card to access the University library.” Other respondents mentioned using a partner’s university library membership and a friend’s login to UpToDate. Many midwives noted that they had alumni library privileges but commented on the limitations of such access, especially in cases where such privileges do not extend to online databases.

Library Skills and Evidence Based Practice Competencies

Question 14 asked participants with multiple choice and an optional short answer question if they had ever received library skills training. Twenty-eight percent reported that they had never received training (or could not remember). Overall, 54% reported receiving some library skills training during their midwifery education and training, and the remaining 18% had exposure to this training through other means. Those who made additional comments for this question noted that such training was “limited,” or superficial: “we touched on it.” Several respondents noted that they received more training in library skills during the acquisition of degrees unrelated to midwifery. Other comments highlighted that training was brief, years ago, and that the specifics of the instruction were difficult to recall:

- “This training was 10-15 years ago. A lot has changed since then.”
- “But I can’t call on that knowledge even

though it’s been 7-10 years.”

- “20 years ago, too long ago”

Participants reported interest in receiving library skills training; however, a number of comments indicated that training would not be useful without access to library resources.

Results of the EBP competency question summarized in Figure 5 indicate that very few respondents identified as expert in any of the EBP competency areas, and the majority of responses were in the middle points of the scale. The highest levels of expertise were reported for converting the need into an answerable question and application of evidence to practice and the lowest levels for critical appraisal of evidence.

Using an aggregate metric of EBP competency, we compared competency scores across groups. Self-reported competency scores increase with experience, with mean scores of 5.7 for those with less than 5 years in practice; 6.0 for those with between 5 and 19 years, and 6.5 for those with 20 or more years. Similarly, higher competency levels are reported for those with graduate level education (6.4 for Master’s and 7.1 for PhD) as compared to those with undergraduate degrees (5.7). Respondents with library access report higher levels of expertise (6.0) than those who do not report access to a library (5.5).

Challenges to Using Clinically Relevant Research in Practice

Participants were asked to indicate their level of agreement with a set of five challenges as factors in their own practice. Figure 5 summarizes the results, showing the percent of all respondents who indicated agreement or strong agreement with each statement. Lack of access to information showed the highest level of agreement (53%), followed by the difficulty in judging the quality of research (41%), which reinforces the low self-reported competency in this area.

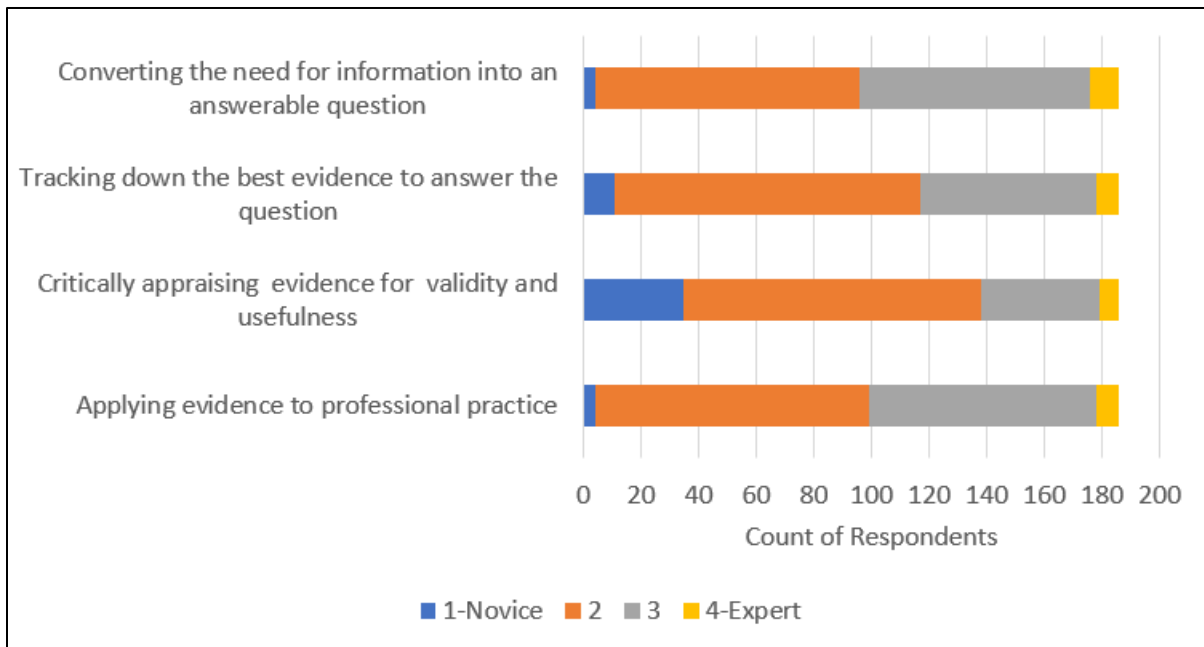


Figure 5
Levels of reported expertise across EBP competency areas.

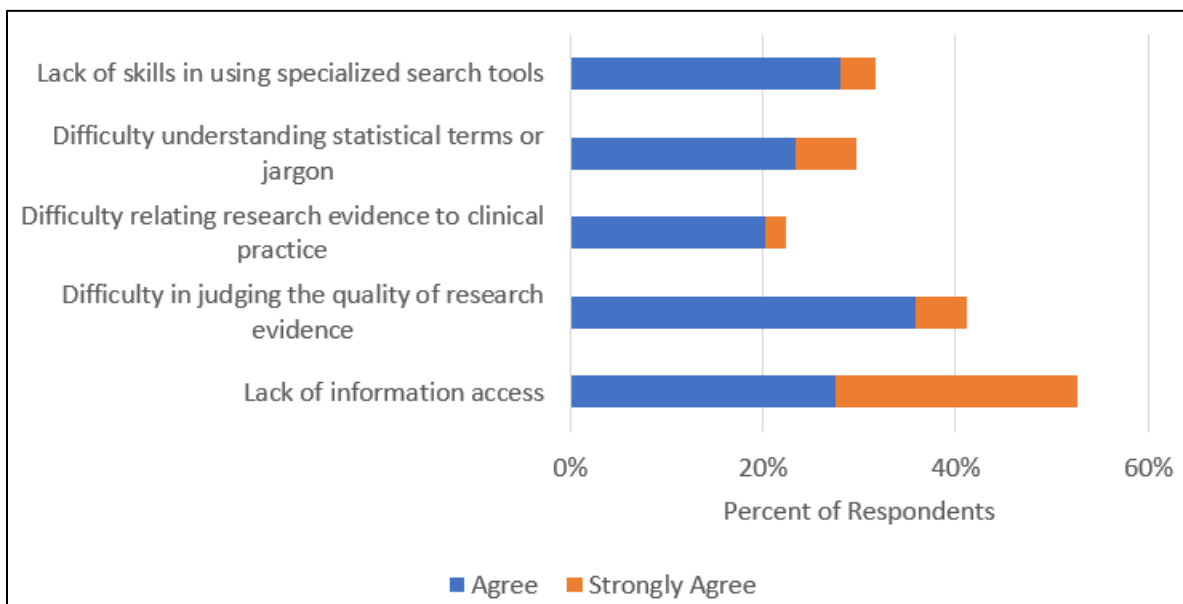


Figure 6
Levels of agreement with challenges to using clinically relevant research in midwifery practice.

Further analysis regarding the challenges associated with lack of information access suggests that some variation exists across groups:

- 62% ($n = 31$) of midwives working in rural settings agreed that information access was a challenge in comparison with 47% ($n = 45$) of those working in urban settings;
- 66% ($n = 51$) of early career midwives agreed that information access was a challenge in comparison with 29% ($n = 6$) of those with more than 20 years' experience;

The high costs of paying to download articles and buy memberships to point of care tools such as UpToDate were mentioned repeatedly in response to the open question. Comments included the following:

- "I think the biggest limitation is access to information. SOGC guidelines, UpToDate and several other critical sources are now fee for service and some midwifery clinics will not pay these fees, leaving the midwives at a disadvantage for relevant data."
- "Subscriptions to library databases is very expensive particularly for small practices or individual midwives."
- "The main barrier to accessing medical libraries and online journals is cost. For a midwifery clinic or individual midwife to afford this they need to pay midwives adequately."

Discussion

This study set out to understand the extent to which Canadian midwives have access to and make use of clinically relevant information in practice. One third of survey respondents reported having no library membership. Urban midwives and those with graduate degrees reported higher levels of library membership. This level of access is consistent with

Veeremah's (2016) study, in which one third of respondents reported limited access to information, and it affirms prior research indicating that access to information continues to be a challenge in professional contexts (Leckie et al., 1996; Spenceley et al., 2008), even as digital and mobile information technologies proliferate. Results further show that those respondents without library access were less likely to be frequent users of clinically relevant information and were more likely to refer to websites, which undergo less quality control than published summaries, textbook-like e-resources, or research articles. Considering the high degree of responsibility and technical knowledge required in midwifery, this finding is concerning, as it brings into question the quality, consistency, and equity of care across settings. While other health practitioners in Canada enjoy access to digital libraries offered by their colleges and associations, midwives do not benefit from such a program, which could be considered a basic component of EBP.

More than 50% of survey respondents agreed that access to information is an obstacle to EBP, with more limited agreement that finding, using, and evaluating clinically relevant information is challenging. A surprising result was that respondents reported finding creative ways to access the information they needed for EBP by bypassing paywalls and borrowing memberships. One respondent linked this issue of information access with the broader issue of hospital integration and hospital privileging, by indicating that they were denied access to information by the hospital. If midwives are barred from using library services by virtue of not being "staff" and holding "privileges," this bureaucratic barrier raises ethical implications for patient safety and should be addressed as a matter of urgency. In this context, "borrowing" access privileges, which breaks licensing agreements and constitutes a misuse of library systems, can be viewed as a form of activism designed to redress an imbalance of power and privilege within the healthcare field. While this study did not examine the impact of

organizational factors on EBP, studies such as that carried out by Bayes et al. (2016) show that midwives are vulnerable to opposition to EBP from hospitals, colleagues, and superiors, in part because EBP guidelines may run counter to dominant medicalized approaches to childbirth (Toohill et al., 2017). This perspective should be explored further, as the role of power and privilege in information seeking and EBP is largely absent from prior research and existing conceptual frameworks (e.g. Leckie et al., 1996; Spenceley et al., 2008), and it may offer new insights, particularly for the study of midwifery in Canada.

The majority of midwives reported difficulty judging the quality of the evidence. This finding is echoed in studies by Fairbrother et al. (2016) and by Ross (2010) who reported that nurses had difficulty understanding articles and had insufficient skills critiquing the literature. Midwives indicated that the information literacy skills they received during their education was limited and, in many cases, stale. However, midwives with advanced degrees (graduate, PhDs) ranked themselves more highly on evidence based practice competency scales than their undergraduate-holding colleagues. Guyatt et al. (2000) considered the skills of critical appraisal of primary studies to be invaluable, stating that health care providers who had these skills would be better able to identify when attempts to influence practice were made based on evidence (or to justify childbirth interventions). Lafuente-Lafuente et al. (2019) echo this sentiment, stating that practitioners who used primary studies infrequently were less able to independently verify the guidance provided in clinical practice guidelines. In the context of increasing childbirth interventions, midwives with quality appraisal skills of original literature may be better able to identify when clinical guidelines are out of date, biased, or have used poor methodology. This finding points to the fact that increasing the accessibility of information is only one component of a much broader set of challenges, which includes the need for training and capacity building.

Results of this study reinforce previous findings that clinical practice guidelines are an essential resource for clinicians. In total, 91% of midwives in this study reported frequent use of summaries such as those published by the Society of Obstetricians and Gynecologists of Canada, the Association of Ontario Midwives (AOM), and the Perinatal Services of British Columbia. However, clinical practice guidelines developed by the SOGC are currently behind a membership firewall, despite their relevance for maternity care professionals. Membership in SOGC is fee-based (\$160 per year) and many midwives in this study indicated that they did not have access to these guidelines. The College of Midwives of British Columbia recently rescinded their clinical practice guidelines (which were freely available on their website), and no longer create or maintain them due to a lack of funding and the existence of guidelines from national expert bodies such as the SOGC and the Perinatal Services of British Columbia (R. Comfort, personal communication, July, 10, 2019). This decision is concerning in light of the findings of this study and because midwife-specific guidelines address the person-centered model of care that characterizes Canadian midwifery.

The opinions of trusted colleagues were the second most common information source used by surveyed midwives, which is not surprising given that this is one of the most consistent themes in the information-seeking research on professionals, nurses, and midwives (De Leo et al., 2019; Leckie et al., 1996; Spenceley et al., 2008). While this research did not examine why this is the case, it is clear from the wider literature that interpersonal sources of information are valuable in the context of EBP for a number of reasons, including that people provide information that is contextualized and experience based, and in some cases they perform a translational role, by sharing information in a form that is more easily understood or made more relevant for a particular audience (Thompson et al., 2001b). Given this preference for collegial information

sharing, mentorship or peer-based training models for EBP in midwifery may prove to be effective (Fairbrother et al., 2016). At the same time, the reliance on colleagues as information sources reinforces the role that a supportive organization plays in enabling EBP, including midwife leaders able to champion change (Bayes et al., 2019; Spenceley, et al., 2008).

This study has focused only on select components of the conceptual frameworks developed by Leckie et al. (1996) and by Spenceley et al. (2008), notably, aspects of the individual (education, work experience, skills); the work setting (region, employment status); the sources of information (accessibility, source type); and the outcomes (information behaviours). Results are based on limited self-report data and statistical tests were not conducted. Therefore, these results are not generalizable. A more comprehensive study would need to consider additional features, notably, the impact of organizational factors and time pressures, which are known to influence EBP. Given the lack of prior research in the Canadian context and the unique nature of midwifery practice in Canada, further research is needed to validate and extend these findings. One contribution of this study is the identification of information-seeking strategies that sidestep existing systems and norms in order to meet needs, and which may reflect structural barriers and power imbalances that are not currently addressed in these models.

Conclusion

Canadian midwives, as experts in physiologic birth, enjoy an expanded scope of practice that requires frequent and ongoing consultation with information. As professionals committed to EBP, access to high-quality information would seem to be a given; however, the results of this survey indicate that a substantial number of midwives are practicing without such access. Clinical practice guidelines support the work of midwives but are inaccessible to many midwives due to paywalls. Respondents lacked

confidence in evidence based practice and reported critical appraisal as an area for development. While no Canadian universities currently offer higher degrees in midwifery, it may be that future offerings of advanced midwifery programs would have a beneficial effect on evidence based practice proficiency as midwives with advanced degrees had higher self-reported EBP expertise. Coordinating access to digital biomedical collections or removing barriers to midwife access of these collections is one way that hospitals, health authorities, and their libraries, provincial, or national associations could help midwives practice EBP. Hospital and academic libraries should prioritize the information needs of student and practicing midwives and identify ways to foster use of library resources through educational interventions.

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Appendix

Survey Instrument

1. How many years have you been practicing as a midwife?
 - 0-40
2. What is your highest degree earned?
 - Bachelors
 - Masters
 - PhD
 - Other
3. Which province or territory do you practice in predominantly?
4. What is your status as Registered Midwife?
 - Full time
 - Part time
 - Non-practicing
 - Other
5. Are you a midwifery educator? (preceptor, NRP instructor, faculty position etc.)
 - Y/N
6. In what setting are you currently practicing? Select the best answer.
 - Urban
 - Suburban
 - Rural
 - Remote
7. How often do you refer to clinically-relevant, external information in the practice of midwifery? (guidelines, manuals, books, websites)? 6-point Very frequently – Never
8. Do you hold membership in an academic library or hospital library? (Check all that apply)
 - Yes, through an academic library at a university where I am faculty/employed/studying
 - Yes, through membership in a College or private library (e.g. CMA, CFPC, CNA)
 - Yes, through my hospital (privileges/staff)
 - No, I do not hold membership in an academic/hospital library
 - Unsure
 - Other
9. If you answered Yes to the above, how often do you access clinically-relevant information through your academic or hospital library membership? (7 point Very frequently – Never, N/A)
10. How often do you visit your local public library to find clinically-relevant information for midwifery practice? (6 point Very frequently – Never)
11. Please rank use of the following information sources and modes of delivery in your midwifery practice:
 - Manuals (NRP, ALARM)
 - Colleagues
 - Studies (primary studies)
 - Popular websites
 - Print books
 - Social media
 - Summaries (clinical practice guidelines, systematic reviews, algorithms)
 - Textbook-like e-resources (UptoDate, DynaMed)
 - Apps

12. Please rank the challenges to using clinically relevant research in your practice
 - Lack of information access
 - Difficulty in judging the quality of the research evidence
 - Difficulty relating research evidence to clinical practice
 - Difficulty understanding statistical terms or jargon
 - Lack of skills in using specialized search tools
13. The Association of College and Research Libraries (2016) recognizes that information sources must be evaluated “to acknowledge biases that privilege some sources of authority over others, especially in terms of others’ worldviews, gender, sexual orientation, and cultural orientations.” How relevant do you think this statement is to the practice of midwifery? (5 point Very relevant – Completely Irrelevant)
14. Sackett et al. (2000) describe evidence-based medicine as “the integration of best research evidence with clinical expertise and patient values.” Based on this statement how do you rate your competence in the following: (5-point Expert – Novice)
 - Converting the need for information (about prevention, therapy, diagnosis) into an answerable question
 - Tracking down the best evidence with which to answer that question
 - Critically appraising that evidence for its validity (closeness to truth) and usefulness (clinical applicability)
 - Applying evidence to the context of professional practice
15. Have you ever received library skills training (i.e., Boolean operators, truncation, controlled vocabularies, databases)? Check all that apply:
 - Yes, during my midwifery education and training
 - Yes, through my hospital or place of work
 - Yes, during the acquisition of a post-midwifery credential
 - No or cannot remember
 - Other (please elaborate)
16. How interested would you be in receiving library skills instruction relevant to midwifery? (5-point Very Interested – Uninterested)
17. Would you like to share more detail about any of the above questions?