Lessons learned from the implementation of Canada's first alongside midwifery unit: A qualitative explanatory study

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A B S T R A C T

Background: In July 2018, Canada's first midwife-led alongside midwifery unit (AMU) opened at Markham Stouffville Hospital (MSH) in Markham, Ontario. Our objectives were to examine how the conditions at MSH made it possible for the hospital to create the first AMU in Canada and to identify lessons to inform spread by examining how characteristics of the intervention, the inner and outer settings, the individuals involved, and the processes used influenced the MSH-AMU implementation process.

Methods: We conducted key informant interviews and document analysis using Yin's research methods. We used the Consolidated Framework for Implementation Research to conceptualize the study and develop semi-structured interview guides. We recruited key informants, including midwives and other health professionals, hospital leaders, leaders of midwifery organizations, and consumers, by email using both purposive and respondent driven sampling. Interviews were digitally recorded and professionally transcribed. We identified documents through key informants and searches of Nexis Uni, Hansard, and Google databases. We analyzed the data using a coding framework based on Greenhalgh et al.'s evidence-informed theory of the diffusion of innovations.

Results: Between November 2018 and February 2019, we conducted fifteen key informant interviews. We identified thirteen relevant documentary sources of evidence, including news media coverage, website content, Ontario parliamentary records, and hospital documents. Conditions that influenced implementation of the AMU fell within the following domains from Greenhalgh's diffusion of innovations theory: the innovation, the outer context, the inner context – system antecedents for innovation and system readiness for innovation, communication and influence, linkage – design phase and implementation stage, and the implementation process. While several unique features of MSH supported innovation, factors that could be adopted elsewhere include organizational investment in the development of midwifery leadership skills, intentional use of change management theory, broad stakeholder involvement in the design and implementation processes, and frequent, open communication.

Conclusions: The example of the MSH-AMU illustrates the value of utilizing best practices with respect to change management and system transformation and demonstrates the potential value of using implementation theory to drive the successful implementation of AMUs. Lessons learned from the MSH-AMU can inform successful spread of this innovative service model.

Introduction

The 2016 Lancet Maternal Health Series highlighted that in high and middle-income countries around the globe, there is a concerning trend of "too much, too soon" (The Lancet Maternal Health Series study group, 2016). The routine use of obstetrical interventions during childbirth which are unsupported by research evidence, such as induction of labour and caesarean section, can increase the risk of harm and raise health care costs (The Lancet Maternal Health Series study group, 2016).

The Birthplace in England Study, a very large prospective cohort study, demonstrated that for people with low-risk pregnancies, giving birth in a midwifery-led unit is associated with lower rates of intervention and no difference in perinatal outcomes when compared to giving birth in an obstetric unit (Brocklehurst et al., 2011). Subsequent policies in the UK have supported the integration of midwifery-led units in all British hospitals, and by 2018, two-thirds of British hospitals had midwifery-led units (NHS, 2014; Tyler, 2012; McCourt et al., 2018). While midwifery-led units have been implemented in other countries, including Australia, New Zealand, the Netherlands, Malawi, and South Africa, they remain

an under-utilized 'best practice' (Edmonds et al., 2020; Hermus et al., 2017; Hofmeyr et al., 2014; Tracy et al., 2005).

Midwifery-led units, which include birth centres, are care settings run by midwives in which they autonomously provide intrapartum care as the primary health professional (Edmonds et al., 2020). Midwifery-led units may be either 'freestanding' (separate from a hospital) or 'alongside' (located on the same site as a hospital with an obstetric unit). In Canada, there are a limited number of freestanding midwifery-led units. The first 'maternity' unit was established in Puvirnituq in 1986 in northern Quebec to bring birth back to Inuit communities (Wheeler, 2017). In the province of Ontario, Tsi Non:we Ionnakeratstha Ona:grahsta', an Indigenous maternal and child centre which includes a midwife-led birth centre, opened in 1996 (Six Nations Health Services, 2006). When the province of Quebec regulated midwifery in 1999 freestanding 'maisons de naissance' were established which are the primary locations from which all midwifery services are offered (Clavel et al., 2015; Ordre des Sages-Femmes du Québec, n.d.). Two additional freestanding birth centres were established in Ontario in 2014 (Ontario Ministry of Health, 2017). However, across the country, most hospital-based intrapartum care occurs in obstetrical units that are physician-led and staffed by obstetrical nurses. Midwives in Canada work primarily in midwifery-led continuity-of-care models, providing antenatal care in community-based settings (midwifery practice groups, health centres, or birth centres). They usually hold hospital privileges that allow them to provide intrapartum care in hospital as a primary care provider.

In July 2018, the first midwife-led alongside midwifery unit (AMU) in Canada opened at the Markham Stouffville Hospital (MSH) in Markham, Ontario (Cameron et al., 2020). The unit is located within MSH adjacent to the obstetrical unit (Cameron et al., 2020). It is midwife governed and has distinct policies and protocols from the obstetrical unit (Cameron et al., 2020). Primary intrapartum care is provided by community-based midwives working in a continuity-of-care model (Cameron et al., 2020). The unit is staffed by a hospitalist midwife, a highly experienced midwife with expanded clinical skills who provides clinical support and mentorship to the community midwives (Cameron et al., 2020). The hospitalist midwife manages the unit, facilitates admissions and discharges, interfaces with consultants, supports learners, and attends births as the second midwife (Cameron et al., 2020). The creation of the first AMU in the country provided an opportunity to examine the implementation process and to identify lessons learned to inform decision makers in similar health systems about how such an innovation could be spread and scaled up. This is particularly important given that one of the explicit goals of the MSH-AMU was to develop a model that could be replicated.

Methods

Study design and aim

We conducted qualitative explanatory research using key informant interviews and document analysis as the main sources of evidence following the methods of Yin (2018). The phenomenon of interest was defined as the implementation of the first AMU in Canada at MSH. As the first example of an AMU in Canada, the MSH-AMU is a critical case that allows us to understand how and why this innovation came to be. Our primary aim was to examine how, and under what conditions, the MSH-AMU was implemented. We were also guided by two secondary research questions: 1) How did the conditions at MSH make it possible for the hospital to create the first alongside midwifery unit in Canada? 2) How have the characteristics of the intervention, the inner and outer settings, the individuals involved, and the processes that were used influence the MSH-AMU implementation process?

Setting

The Ontario health system is publicly funded, and perinatal services are fully funded. Ontario hospitals are private, not-for-profit cor-

porations that operate using public funds. Ontario midwives work primarily in a community-based, midwifery-led continuity of care model and attend 18% of the province's births (Association of Ontario Midwives, n.d.). Midwives working in this model are self-employed and are remunerated for a bundle of services (i.e., prenatal, intrapartum, and postpartum care), with funding flowing from the Ministry of Health through local transfer payment agencies to midwifery practice groups (Katherine and Knox, 2006).

Markham Stouffville Hospital is a large community hospital that serves more than 435,000 patients per year (Markham Stouffville Hospital, 2021). Markham is a municipality in the Greater Toronto Area, Canada's largest metropolitan area. It is an ethnically diverse ("World Population Review, 2021 (Demographics, Maps, Graphs)," n.d.), growing suburb, with a population that is predominantly working class or middle class. Markham's population grew nearly 65% between 2001 (208, 615) and 2017 (342,970) (Data Commons, 2021).

Theoretical framework

The conceptualization of our study was informed by the Consolidated Framework for Implementation Research (CFIR) (Damschroder et al., 2009). The CFIR is a meta-theoretical framework that can be used to understand the implementation of complex health services interventions and guide formative evaluation of interventions in context. The CFIR is comprised of five major domains—the intervention, inner and outer settings, the individuals involved, and the process by which implementation is accomplished. The CFIR informed our study preposition that characteristics of the AMU, the hospital, the outer settings, the individuals involved, and the processes that were used all contributed to the degree of success of the MSH-AMU implementation.

Participants, recruitment

We recruited key informants by email, initially using purposive sampling and then using respondent driven sampling. Within MSH, we sought participation from midwifery, nursing, and physician program leaders; senior hospital administrators; and community and hospitalist midwives. We also recruited leaders of external midwifery professional organizations; health system decision-makers; and midwifery consumer representatives. Potential participants were invited to participate in their choice of a telephone or in-person individual interview. Interested participants were sent a detailed letter of information and consent form prior to the interview. The study was approved the Hamilton Integrated Research Ethics Board (HiREB, protocol #5050) in Hamilton, Ontario, Canada.

Data collection

One-on-one interviews were conducted by a PhD-trained registered midwife and researcher (10 interviews), a master's-trained research coordinator (1 interview), and a midwifery student research assistant with prior master's training (4 interviews), all of whom are women. Our research center was leading a broad evaluation of the MSH-AMU that had been commissioned by MSH. Participants were aware of the collaborative relationship our research team has with the AMU and many were acquainted with the primary investigator through professional networks. As a midwife-led research team, our approach to this research was driven by an interest in generating evidence that can be used to improve access to high quality midwifery services. We developed and used a semi-structured interview guide that was informed by the CFIR and our research questions (see Appendix A). Telephone interview participants gave verbal consent to the interviewer before the interview began, and we obtained written consent from participants who were interviewed in person. Interviews continued until data saturation was reached. Interviews were audio recorded and professionally transcribed. Transcripts were not returned to participants for comment and/or correction.

Table 1

Search strategy for documentary evidence.

Data source	Search strategy
News Media	
NexisUni	"midwi*" AND ("Markham" OR "[first name last name of midwifery leader]"); limit search to 2011-Present
YorkRegion.com	"midwife"
CBC.ca	"midwi*" "Markham"
	"midwi*" "[first name of midwifery leader]"
Google News	"midwi*" AND Markham Stouffville
Websites	
Government of Ontario Press Releases	"midwife"
Ministry of Health Website	"midwife"
	Also followed links (e.g., to Patients First)
[X] Hospital Website	"midwife"
	Also browsed website
Association of Ontario Midwives Website	"Markham"
	Also browsed website
Hansard	
Legislative Assembly of Ontario	"midwife"; limit search to 2015-Present

We conducted systematic searches of news media sources (NexisUni, YorkRegion.com, CBC.ca, Google News), Websites (Government of Ontario press releases, Ontario Ministry of Health, Markham Stouffville Hospital, Association of Ontario Midwives), and legislative records (Hansard). Full details of the search strategy are provided in Table 1. We also asked key informants at MSH to share relevant documents.

Data analysis

Interview transcripts were managed and coded using NVivo software. We used multiple strategies to analyze the data. First, we began with an inductive approach to data analysis, reading and re-reading the data, and noting initial ideas. One researcher (ED) coded interview transcripts using open coding, "working the data from the ground up" (Yin, 2018). A second researcher (CM) independently coded the interview transcripts using codes informed by Kingdon's (2011) agenda setting framework to understand how the AMU made it on the government's decision agenda and the 3i framework (Lavis, 2013) focused on policy development to understand the range of factors influencing the policy decision to fund the AMU. The two researchers then met to discuss the themes emerging in the data and to compare them to existing implementation theory. The emerging themes mapped most closely to the conceptual model for considering the determinants of diffusion, dissemination, and implementation of innovations developed by Greenhalgh et al. (2004) so we developed a coding structure based on this framework. We then conducted a second round of coding in which one researcher (ED) re-coded all the transcripts using the coding framework based on Greenhalgh conceptual model, and a second researcher (CM) coded five transcripts to ensure consistency in interpretation. A third researcher (RE) coded the documents using the coding framework for completeness of findings. We then used an iterative process of explanation building that involved synthesizing our interview and documentary data with the theoretical underpinnings of Greenhalgh's conceptual model of health care innovations. Using the coded data, one researcher formulated explanatory propositions about each component of Greenhalgh's conceptual framework that was included in our coding framework. These explanatory propositions and the supporting data were then reviewed, first with the full research team and then with MSH staff (including both interview participants and non-participants), to revise and corroborate the findings.

Quality

We used multiple strategies recommended to ensure research quality (Yin, 2018). Investigator triangulation was used during coding to con-

firm similarity of findings. The explanatory propositions were presented to MSH staff to use member checking and to verify construct validity. We achieved internal validity by using pattern matching and examining rival patterns and by using evidence building to formulate the explanatory propositions. Our use of a framework approach to coding based on Greenhalgh et al.'s (2004) evidence-informed theory of the diffusion of innovations strengthens the external validity of our findings. We developed a study database and maintained a clear chain of evidence to ensure reliability. We have also reported our findings in this paper in accordance with the consolidated criteria for reporting qualitative research (COREQ) checklist.

Results

We conducted a total of 15 key informant interviews between November 2018 and February 2019. Interviews ranged from 8 to 82 min in duration, with most lasting between 15 and 45 min. To obtain a range of perspectives, our interviewees included two hospital managers, two hospital senior leaders, two obstetricians, two leaders from external midwifery stakeholder organizations, three community midwives, three hospitalist midwives, and one midwifery consumer. We invited two health system managers to participate and both declined due to constraints in obtaining approval. No participants withdrew from the study after agreeing to an interview. One interview was conducted in-person at the AMU, and the rest were conducted by phone.

Document searches were conducted on May 13 and 14, 2020. We identified 13 relevant documentary sources of evidence, including news media coverage (CBC News, 2019; Martin, 2018; Government of Ontario, 2018; Yousif, 2018) (*n*=4), content from websites (Ontario Ministry of Health, 2017; Markham Stouffville Hospital, 2018; Association of Ontario Midwives, 2019; Markham Stouffville Hospital, 2020; Markham Stouffville Hospital, 2020) (n=5), and Hansard records from the Ontario parliamentary legislature (Ontario Legislative Assembly, 2019; Ontario Legislative Assembly, 2015) (n=2), and internal MSH-AMU documents (Co-design Report, Proposal, and first Annual Report).

The conditions that influenced the implementation of the MSH-AMU were derived from the data and fell within the following six domains from Greenhalgh et al.'s (2004) theory regarding the diffusion of innovations: 1) the innovation; 2) the outer context; 3) the inner context – system antecedents and system readiness for innovation; 4) communication and influence; 5) linkage – design phase and implementation stage; and 6) the implementation process. We discuss each of these domains below and present explanatory propositions that arose from the data to explain how factors within each domain contributed to the implemen-

tation of the MSH-AMU. Table 2 provides illustrative quotations from the key informant interviews for each factor.

The innovation

Factors related to the MSH-AMU itself that facilitated implementation included relative advantage, compatibility, observability, and potential for reinvention.

Relative advantage. Cost efficiency was a key driver of the AMU's relative advantage by offering savings through reduced nursing costs, lower intervention rates, and shorter lengths of stay. AMU proponents were able to describe the potential cost savings by extrapolating from data on hospital midwifery care expenditures prior to the AMU. This supported the development of a concrete proposal to the Ministry of Health that made a strong, detailed case for the cost-efficiency of the AMU. Additionally, obstetricians, midwives, and clients were all able to envision how the AMU would benefit them. Anticipated benefits included a reduction in 'nuisance' consultations for obstetricians (consultations from inexperienced midwives for concerns that might otherwise appropriately be addressed by discussion with an experienced midwife), support for efficiency in time spent with clients for community midwives, new job options for midwives, and an ideal birth environment for clients.

Compatibility. The AMU model was compatible with the values of both community midwives and the hospital. For midwives, the innovation offered an opportunity to promote physiologic birth. For the hospital, it aligned with the mission statement which emphasizes innovation and excellence in patient experience.

Observability. During the design phase, champions of the AMU used dialogue to make visible the potential benefits of the innovation, particularly for obstetricians. Midwives had worked in the MSH obstetric unit since 1994. Prior to the AMU opening, there was an opportunity to implement the hospitalist role on the obstetrical unit which made it possible for nurses and physicians to observe the potential benefits of the model.

Potential for reinvention. The concept underwent a long period of refinement during the design phase. While the concept was inspired by AMUs in other jurisdictions, the specific details were formulated to maximize the benefits specifically for the MSH hospital and the Ontario midwifery context. The lengthy period of 'incubation' allowed the innovation to be "discussed, contested, and reframed" (Greenhalgh et al., 2004, pg. 594) - this discourse allowed relative advantage to become apparent. In the initial stages of the design phase, reinvention was achieved through a LEAN process (NEJM Catalyst, 2018) that engaged a broad group of stakeholders, and it also involved hospital leadership creating a novel governance structure that would work within the Ontario hospital context while supporting midwife-led governance.

Outer context

The following factors external to MSH supported the implementation of the AMU: incentives and mandates, the sociopolitical climate, and the health needs of the local population.

Incentives and mandates. Buy-in from the Ontario Ministry of Health was a key factor to success. The Ontario Midwifery Program (the program within the ministry which is responsible for funding midwifery services in the province) was eager to support a new model that had the potential to offer cost efficiencies for midwifery services and worked to secure a mandate to fund the project. The funding arrangements for hospitals in Ontario acted as an incentive for hospital leadership to support the AMU proposal, because base funding for hospitals remains stable if hospitals decrease their costs through shorter lengths of stay.

Socio-political climate. Multiple factors coincided to create a window of opportunity that supported the final decision to fund the project, including alignment with the broader mandate of the ministry of health at the time (Ontario Ministry of Health, 2017). Support within the midwifery profession in Ontario was also important. The proposal for the AMU aligned with evolution within the profession that supported greater openness to new service delivery models. Regulatory barriers related to registration requirements for midwives (e.g., requirements for all midwives to work in a continuity-of-care model and practice in both home and hospital settings) had been removed by the College of Midwives of Ontario. The AMU proposal also aligned with the advocacy agenda of the Association of Ontario Midwives, which was committed to creating alternative work opportunities for midwives while supporting the model of community-based midwifery-led continuity of care. Buy-in from the Association for the new funding mechanism used to fund the MSH-AMU was crucial for the project to move forward.

Health needs of the local population. The hospital's catchment area, Markham and the surrounding communities, had been growing steadily. Population growth created an opportunity for the hospital to increase the number of midwife-attended births without threatening the work of the obstetrical/nursing team.

Inner context – system antecedents for innovation

Several factors created a context that was favorable for innovation, including structural characteristics, receptive context for change, absorptive capacity for new knowledge, and learning climate.

Structural characteristics. MSH offered a unique combination of factors that supported the innovation. Physically, a recent building expansion had created unoccupied space adjacent to the existing obstetrical unit. In terms of the organization's maturity and social architecture, the hospital leadership was interested in expanding to serve a growing population. The expansion plans included increasing birth volumes, and the well-established obstetrical team had long-standing positive relationships with midwives and no interest in significantly expanding the volume of obstetrician-attended births. The availability of "slack resources" (Greenhalgh et al., 2004) (i.e., the physical space where the AMU is now located) was frequently cited by interviewees.

Receptive context for change. MSH has a long history of being a trailblazer with respect to the integration of midwifery. The first midwife-attended birth following the regulation of midwifery in Ontario in 1994 occurred at MSH. Midwives at MSH have built positive relationships with other health professionals. MSH was also in the unique position of having a midwife who had occupied a hospital management role. The activities which occurred during the time that midwife was in a management role resulted in midwives being visible within the organization and viewed as change-makers. The hospital leadership was supportive of innovation, and the midwife in the management role – a visionary staff person - was in a pivotal position.

Absorptive capacity for new knowledge. The hospital had invested in building the midwife manager's leadership skills and knowledge. She had unique experience within Ontario as a midwife engaged in hospital administration which created: 1) the capacity to integrate knowledge about AMUs in other contexts, 2) opportunity to reframe this knowledge to envision how it could be used to meet the hospital's strategic objectives, and 3) the skills to sell this vision within the organization.

Learning Climate. MSH had an organizational culture that valued innovation and learning. Leadership sought input from team members and proactively shared knowledge, which made team members feel like essential, valued partners in change processes. The managers who took on leading the implementation of the AMU felt supported by higher levels of administration and psychologically safe to be innovative.

Inner context – system readiness for innovation

Factors contributing to creating a climate within MSH that was receptive to innovation included tension for change, innovation-system fit, support and advocacy, assessment of implications, dedicated time and resources, and capacity to evaluate the innovation.

Tension for change. While neither were completely 'intolerable', the hospital's desire to increase the volume of births, and the obstetrical

Table 2

Illustrative quotations from key informants.

Domains and Factors	Illustrative Quotations
The innovation	
Relative advantage	*So, I think it was an easy, I don't want to say sell, but it was an easy convincing others because the dollars made sense and the Ministry was looking for that, right? So, it also wasn't presenting an opportunity to someone who had all the money that was going to be much more expensive…* Midwifery consumer 1
Compatibility	*It aligned perfectly with our strategies, innovation, patient choice… that's our new mission statement. Our senior leadership team wants to be first to do some stuff … They were open to it.* Hospital senior leader 2
Observability	*…this is an example I'll share with you that happened more than once and kind of helped the physicians. The phone rang, the charge nurse said to [obstetrician] at the desk - who was talking to [the midwifery leader] about the Alongside Midwifery Unit and why it wouldn't work - she said, "The midwife wants to talk to you, Dr. X" And [the midwifery leader] said, "I'll talk to her." So [the midwifery leader] took the phone, she listened to her and then she gave her some advice and she hung up the phone. And she said, "And that's how it's going to work in the future. There's going to be an experienced midwife on, whose going to field these kind of calls and you are not going to be asked, because if you had gotten asked that question just now, you wouldn't have gotten paid for it." So, then they started to listen…* Hospital manager 1
Potential for reinvention	*I think that goes along with how long this project gestated and was thoughtfully conceived of.* External midwifery leader 2
The outer context	
Incentives and mandates	*… where [our hospital has] the opportunity to potentially get more is if we can [provide care to] more women but with the same resources and we can do that with midwifery… when you drive more volume through your hospital but at a lower cost, the hospital is going to want you to do more of it…* Hospital manager 1
Sociopolitical climate	*I don't think there was one factor. I think it truly was like a culmination of factors over a period of time. Like something that big never just happens without multiple stars aligning. So the Ministry had to agree, so I think the minister of health that was in power at the time really believed in and has a soft spot for midwifery births and that model of care. So I think there was no one thing. You know, had it been a different government in power, it never would have happened, I don't think.* Hospital senior leader 1 *I do feel like the College is much clearer in its role, or has decided to maybe not meddle in the model as much and in terms of its role as a regulator… I think that by having made that decision several years ago to back out of that and realize that the role of the regulator isn't necessarily about maintaining a certain model, it's about maintaining competency or assuring competency and safe practice. Then it was easier for the College to sort of jump at that, at being supportive and not automatically thinking that this is going to be a challenge.* External midwifery leader 1
Health needs of the local population	*I'm expecting the midwifery program to grow and the obstetrical program to stabilize… We live in a very affluent neighborhood. Markham… so people have money and they come informed. They know what they want. They educate themselves before they arrive at a pregnancy and a number of them want a midwifery delivery because it gives them what they're looking for.* Hospital manager 1
The inner context – system antecedents for innovation	
Structural characteristics	*And the third thing is we had [the] capacity to do it, like we didn't have to build a new building or anything new. We had an empty unit that we were waiting to grow into because of our expansion. We had an empty unit sitting right beside labor and delivery that we were eventually going to grow into, presumably with labor and delivery volumes anyway. So we really had a perfect physical environment to make it happen.* Hospital senior leader 1 *I think another huge advantage in this project specifically was having the actual space available. It's pretty unique circumstance that there would be a vacant unit available for the AMU to populate.* External midwifery leader 2
Receptive context for change	*I believe Markham Stouffville is probably the most innovative in the kind of care in regards to midwifery. First midwife to be practicing in hospital was at Markham Stouffville. That particular hospital just always wanted to be innovative and providing client-centered care or as they call it patient-centered care.* Community midwife 3
Absorptive capacity for new knowledge	*I did a lot of training here at the hospital when I was in the manager role. So that did a lot for me and that was all about - they call it continuous quality improvement. It's a bit of a buzzword, but essentially it's about how to really seriously move things forward. I was also selected to go on a leadership training program, and I got a lot out of it, just in terms of how to engage teams, how to handle difficult conversations, how to move things forward, etc., etc. And I just, you know, was able to apply all that. So while I had done it before, I had done it very innately and very much based on gut. It wasn't unsuccessful, but I feel like these tools really helped me to do it better, be more effective. It was a big gap, right? …I think that you need to have some education around that and surround yourself with the right people, right?* Hospital manager 2
Learning climate	*…so leadership changed over and there was no longer a culture of blame. There was no longer a culture of if you try something and you fail, you'd better be able to explain it. [The new senior leader] doesn't care about that. She's like, ha, if you fail at it, we'll know what not to do the next time. And when you've got that kind of backup, then people will say okay, I'll give it a go. And sometimes you strike a homerun and sometimes you strike out, so whatever. But this time we struck a homerun.* Hospital manager 1
The inner context – system readiness for innovation	
Tension for change	*And then we looked at the things that caused us the most grief or, you know, the most nuisance when we were on call. And there is a very high or there has been a very high turnover when it comes to midwives. So one of the problems that results is we're continuously seeing very new, very green midwives with just lack of experience and lack of confidence. And so we end up being consulted for a lot of things that really we shouldn't be and it ends up being a handholding exercise. And there are certainly members of my group who find that a big nuisance.* Obstetrician 1
Innovation-system fit	*I think it's more we've got a unique culture here, for sure… I think innovation is a big part of what we do.* Hospital manager 2
Support and advocacy	*I started here about four and a half years ago and when I came, the idea had been proposed to senior team… but it really wasn't getting any traction or support from the previous person in my role, which is fine. But then they proposed the idea to me and I was quite keen on helping to support their idea…* Hospital senior leader 1

Table 2 (*continued*)

Domains and Factors	Illustrative Quotations
Assessment of implications	*There were a couple of people that were like a little bit nervous about what would it look like if we were to go this way? But even those people [supported] working committees working together to think about all these ins and outs of what issues and problems might arise and try to meet those and clear them before actually bringing together the unit and the proposal. So all that stuff was thought about prior to even approaching the government with a formal proposal.* Community midwife 3
Dedicated time and resources	*We were assigned a project manager and somebody in biomed. In fact, you know what? Those guys, I don't know. I can't believe how much they gave me, a woman and a guy in biomed and just helping us procure things and looking for stuff for us. They were really excited about the project and they really helped pull it all together, too.* Hospital manager 2
Capacity to evaluate the innovation	*So every patient that comes through our hospital – we are a case costing hospital – we can figure out the weighted case for every single patient…* Hospital manager 1
Communication and influence	
Champions	*Well we are polar opposites and work amazingly well together… And where I am very big picture and very visionary and very 'whatever', [the organizational buffer] is the detail… she'll ask the right questions. Not negative at all, she just has the right questions, the ones that 'Ah, I didn't think of that.' But she does overthink things, so we've been able to help each other that way, right? So she's a little bit more 'whatever' than she used to be and I'm a little bit more 'oh, I have to fill out a paper about that' than I used to be… we're good for each other.* Hospital manager 2 *And so in my job, [the transformational leader], she will move things out of the way. I'm kind of like the buffer of okay, well, we can't do it that way because we'll tick people off, so there's a process we need to follow for this. I'd slow it down if there was something legal we were missing. So, I kind of was that lens, whereas she was building the business model.* Hospital manager 1
Change agents	*She had a vision for it. She never let go of that vision. She never stopped driving the whole idea forward and meeting with stakeholders and it really was her tenacity that got it to happen.* Hospital senior leader 1
Linkage – design phase	
Shared meanings and mission	*You need to start really simply with what's best for your patient or client. We tend to naturally approach these types of projects with the mindset of what's best for me. And what's best for me as provider may not be necessarily what's best for you as a patient or the client. So, if you're going to truly make this happen, you need to start with a very patient or client-centered focus and be able to set initially, your own sort of wants and desires aside and then work from the patient or client outwards.* Obstetrician 1
Effective knowledge transfer	*The evidence speaks for itself, but how do you convince people to take that evidence and use it and that it's a good thing for us? And it's that repetitive record of keep saying it and keep saying it and start with the people who are the believers, right? And they're onboard and that word gets disseminated. And when people forget about why something is good, then you repeat it again and you repeat it again. And people are always, well what's in it for me? What am I going to get out of that? And so, really pointing out to them the positive of how it's going to impact them. How it's going to improve them and then how it's going to improve care overall and then how it comes back to them.* Hospitalist midwife 3
User involvement in specification	*… you have to include the people that are involved and really, everybody's involved. It's a hospital setting. I mean, there are tons of people in this institution you don't think that you need when you deliver a baby but there's actually a ton and so you don't butt heads as much. And it was their ideas and it runs better. It's better process.* Hospitalist midwife 2
Linkage – implementation stage	
Communication and information	*So, I think it was really about communication, being supportive, her knowing all of the philosophies or strategies of change management so that she was there and present and giving everybody what they needed. And she was available, always available so that was good.* Hospitalist midwife 1
User orientation	*…We did a lot of flow. We did tabletop exercises with Lego men. Then we actually came on the unit and did it. We did codes. We did drills.* Hospital manager 2
Project management support	*So, I mean, the building we're in. It's only five years old, so there's a lot of people around that had experience planning in that building, planning our whole childbirth unit, so just kind of drawing on that and their expertise.* Community midwife 2
Implementation process	
Decision making devolved to frontline teams	*I don't think it's ever been just leadership at the top taking the direction and then sort of forming it. It's really been buy-in from all the midwives and we've really felt a part of it.* Community midwife 1
Leadership engagement	*And I think the biggest part, though, is [her] just being really hands-on getting help that she's done a few shifts as a hospitalist so she really got to see firsthand what was running well and what wasn't.* Community midwife 2
Human resource issues (especially training)	*We had meetings for everything throughout the whole opening of the unit. We had meetings with every single department. I mean, we included everybody, like down to housekeeping facilities, communication.* Hospitalist midwife 2
Dedicated resources	*And I think eventually it was approved and then that's when a small group of midwives got really busy and [first name] became the executive director and that's when all the magic started happening…* Hospitalist midwife 1
Internal communication	*..she keeps us all onboard. Regular updates - they started the Doppler Newsletter, so the midwives are always in the loop. We meet monthly as a division, so we're always part of it.* Community midwife 1
Reinvention and development	*So, it's like oh, that's not working for you? Well then, if that's not working for you, what's your suggestion? How can we make it better? Suggest something. Just don't say it's not working well. So, I think that ability to adapt and to change is there because she's encouraging it and encouraging every midwife to take ownership and to make it a better place.* Hospitalist midwife 1
Feedback on progress	*She gives us a lot of feedback about all the positive things that have gone on and the staff, she keeps really good statistics. She gives the staff immediate feedback, but also just from really in the moment feedback on challenges or that didn't go well. So we're doing cases that really, you know, the near misses, that constant communication. Nobody feels like we're in the dark. And nothing's done behind closed doors and that's really important.* Community midwife 2

teams desire to reduce 'nuisance' consultations from inexperienced midwives created tension for change.

Innovation-system fit. As described above in terms of the compatibility of the innovation, the AMU fit with the organization's existing values, strategies, goals, and skill mix.

Support and advocacy. The concept of the AMU gestated for a long time (at least ten years). Over time, the number of supporters of the idea grew. The project finally gained momentum following changes in hospital leadership which resulted in broad support from individuals in strategically important leadership positions.

Assessment of implications. The long planning process, which broadly engaged stakeholders, allowed implications to be carefully explored and documented.

Dedicated time and resources. Once there was buy-in from senior leadership at the hospital, dedicated staff time and financial resources were provided to support successful implementation. Further along in the process, financial support from the hospital foundation was key to manifesting the vision.

Capacity to evaluate the innovation. MSH is a case-costing hospital, which allowed them to estimate the cost-savings that the AMU would bring, and to monitor the actual costs post implementation. Like all hospitals in Ontario, data on birth outcomes is routinely collected, which supports the capacity to evaluate the clinical outcomes of the AMU. The hospital also engaged with midwifery research leaders at McMaster University early in the design process to ensure that a comprehensive and methodologically strong research plan for evaluation was built into the project.

Communication and influence

Two factors related to communication and influence were champions and change agents.

Champions. The successful implementation of the AMU was the result of the work of several champions who brought a mix of skills and personalities to the process. Key leadership came from a transformational leader who harnessed support from diverse groups within the organization. This leader was also a maverick with a creative vision. She was supported by an organizational buffer, who helped to ensure that rules were followed where necessary without hampering creativity and innovation. The transformational leader was also supported by other key clinical and administrative leaders who acted as opinion leaders and facilitated widespread buy-in across the organization.

Change agents. An individual internal to the organization (the transformational leader mentioned above) acted as a catalyst for change. In addition to the personal attributes that this individual brought to the process, the investments that the organization had previously made in developing her leadership skills and knowledge played a key role in how and why so many things during the planning and implementation process were done so effectively. Various interviewees called attention to her vision, courage, tenacity, communication and interpersonal skills, negotiation skills, and level of preparation for meetings. The role of this individual was necessary but not sufficient to the success of the implementation process.

Linkage – design phase

During the design phase of the innovation, three factors contributed to the success of the process: 1) shared meanings and mission, 2) effective knowledge transfer, and 3) user involvement in specification.

Shared meanings and mission. Among the midwives at MSH, shared values of supporting physiologic birth and strengthening midwifery helped to create buy-in. The engagement and support of others within the organization was achieved by emphasizing shared values of client-centred care, excellence, and innovation. The importance of a shared vision that was client-centred was articulated by multiple interviewees.

Effective knowledge transfer. Effective knowledge transfer was led by a leader who applied the principals of change management to the knowledge translation process. This involved not only sharing information about the idea and communicating the potential benefits, but also listening to stakeholders about their concerns and engaging them in developing solutions to address their concerns.

User involvement in specification. Broad engagement of all stakeholder groups within the organization and potential users (consumers) allowed input into 'specification' of the AMU. This process supported a shared and organic evolution of the value of the AMU and helped health professionals whose work would be impacted by the AMU to ensure that the organizational model would work for them. The LEAN process that broadly engaged stakeholders to map out the initial plan for the AMU was followed by extensive consultation and committee work to refine the details of policies and processes. Many interviewees spoke to the value of involving all stakeholders.

Linkage – implementation stage

Once the project reached the implementation stage, communication and information, user orientation, and project management support all contributed to its success.

Communication and information. Frequent, open communication was employed as an intentional change management strategy. The key leader driving the innovation had strong communication skills and strong interpersonal relationships with her peers, those she was leading, and those above her. She was supported by a peer who helped to ensure that all essential communication occurred (see Communication and influence above). The importance of communication was modelled by leadership and communication skills related to change management that were intentionally developed in other members of the midwifery team. Listening to and addressing the concerns of all stakeholders was effectively used to build buy-in.

User orientation. Health professionals who would be working on the AMU were actively engaged in preparing for implementation and participated in drills and simulations. In addition to helping to refine processes, simulations supported comfort to work in the AMU once it opened.

Project management support. Relevant project management skills existed within the hospital and were well utilized. MSH had recent experience with building new infrastructure, and specialized resources were made available to support the AMU project leadership team. The two leaders with greatest responsibility for implementation had very complementary skills that supported effective project management.

Implementation process

Seven factors that influenced the success of the implementation process were: decision making devolved to frontline teams, leadership engagement, human resource issues (especially training), dedicated resources, internal communication, reinvention and development, and feedback on progress.

Decision making devolved to frontline teams. Both hospitalist and community midwives were actively engaged throughout the implementation process to inform adaptations and improvements as the unit started to operate. This occurred through mock scenarios and drills, daily huddles, regular division meetings, and an anonymous suggestion board.

Leadership engagement. The executive director of the AMU took an active, hands on approach to implementation, had an office on the unit and was present daily. She worked shifts as a hospitalist midwife, which supported her understanding the hospitalist role, and interacted frequently with everyone on the frontline team. The creation of the hospitalist role created another layer of leadership that played a key role in successful implementation. This group of midwives was well respected by the rest of the team, highly involved in decision-making about how the unit would run and contributed to engaging the rest of the frontline team.

Human resource issues. Training and the widespread, direct communication with all hospital staff impacted by the change was used as an intentional strategy to support success. All midwives were provided with training on change management early in the process and those selected for hospitalist roles were provided with additional leadership training. Extensive simulations with all staff who might be involved in providing care on the unit were used to refine processes and helped to build confidence in how thing would function once the unit opened. Leadership broadly engaged people in the implementation process and intentionally worked to maintain their motivation.

Dedicated resources. The project was supported with capital funding from the Ontario Ministry of Health and from the Markham Stouffville Hospital Foundation. Once the project was approved, the leader responsible for the project was in a dedicated full-time role as the executive director. The hospital also funded additional human resources to support the project, including staff with skills in project management and procurement. The hospitalists began working on the obstetrical unit prior to opening of the AMU, which supported important work necessary for successful implementation including policy development.

Internal communication. Open, timely communication was deliberately used to build engagement, inform continuous improvement of the innovation, and establish widespread support. Face-to-face meetings were held with every department impacted (e.g., housekeeping, communications, pharmacy) to develop solutions to anticipated challenges and to establish processes that met everyone's needs. Good communication was broadly viewed by interviewees as a very important factor in supporting effective change management.

Reinvention and development. During the implementation process, midwives and others providing care on the unit were actively engaged in refining roles and processes. The team adopted a continuous improvement mentality in response the encouragement of leadership.

Feedback on progress. Midwives and other hospital team members were provided timely feedback about the impact of the implementation process. Multiple mediums for feedback were used, including a physical board on a wall that was updated with monthly outcome statistics, a newsletter, division meetings, and governance council meetings. The AMU adopted the practice of reviewing clinical errors and poor outcomes in the moment to support continuous improvement. Midwives were also provided with interim updates on the results of evaluation research (e.g., client satisfaction).

Discussion

Our research describes a highly successful process used to implement Canada's first AMU and is the first research that focuses specifically on lessons that can be used to inform scale and spread of this innovation. MSH had several unique features that allowed it to become the initial hospital in Canada to implement an AMU, including a midwife working in a hospital leadership role (which is not the norm in Canada), available space adjacent to the existing obstetrical unit, a growing population with no competing demands from the obstetrical team to increase their caseload, and an organizational culture of innovation. While some of these unique features may not be replicable in other settings, our findings revealed many other facilitators that could be adopted elsewhere, including organizational investment in the development of midwifery leadership skills, intentional use of change management theory, broad stakeholder involvement in the design and implementation processes, and frequent, open communication. The AMU model developed at MSH supports another evidence-based intervention, namely midwifery-led continuity of care models, and offers an example of how the benefits of both AMUs and midwifery-led continuity of care can be integrated.

While previous research on AMUs has not tended to focus on the implementation process, there is a small body of literature relevant to our research. Tracy et al. (2005) described the implementation of an AMU in Australia. They provided only a limited examination of factors contributing to successes and failures in that process. Resistance from

other health professionals was a barrier to establishing the new unit, and leadership support, alignment with regional health policy, and research evidence indicating that the model could reduce costs, improve birth outcomes, and increase satisfaction were facilitators. McCourt's (2014, 2018) ethnographic research on AMUs in England (a component of the Birthplace studies) has investigated the organization and management of AMUs and the experiences of clients and health professionals. In contrast to the MSH-AMU, instigation of new AMUs in England was often driven by pragmatic circumstances (e.g., mergers or closures) rather than a desire to innovate (McCourt et al., 2018). However, as with the MSH-AMU, the creation of AMUs in England was seen as an opportunity to support physiological birth (McCourt et al., 2018). Several factors identified as important to the sustainable management of AMUs to ensure quality and safety are similar to the enablers of AMU implementation that we identified in our research, including the strategic importance of leadership and the importance of working together, and McCourt et al. (2014) noted that these factors had also supported the initial development of AMUs in England.

The creation of the MSH-AMU has partially cleared a path for the implementation of other AMUs in the province of Ontario by supporting the creation of a funding mechanism to support this model of care, developing a midwifery-led governance structure that is compatible with hospitals' regulatory framework, and by generating evidence of the effectiveness of the model in a Canadian context. However, our findings offer valuable lessons that can be applied more broadly to support the successful implementation of AMUs in other jurisdictions. First, our research illustrates the potential benefits for the health system of investing in the development of midwifery leadership skills. Both hospitals and policymakers should consider expanding their investments in midwifery leadership in contexts where this is not yet well developed. Second, the MSH-AMU provides an excellent illustration of how intentional application of implementation theory can support successful implementation. Hospitals and other stakeholders who are interested in implementing an AMU can use the factors that we have outlined in this paper based on Greenhalgh et al.'s framework (Greenhalgh et al., 2004) to conduct a situational analysis to identify in their own context factors that a) exist and can be leveraged, and b) could be intentionally developed to support successful implementation. Finally, there are some factors identified in Greenhalgh et al.'s (2004) framework which did not influence implementation of the MSH-AMU but could be harnessed in other settings. These include building and using inter-organizational networks to promote adoption of AMUs and engaging with leaders from settings with an established AMU so that they can play a role as external change agents.

One limitation of our research was that we were unable to recruit any policymakers to participate in the interviews, which limited the health system perspectives related to how external factors impacted the policy decision to fund Canada's first AMU. However, several of our participants spoke to these issues and there was consistency in how these factors were described. Another limitation is that our research team was based in a midwifery research center, which influenced our perspective as midwifery insiders. It is possible that an outsider lens may have led to differences in the data analysis phase. We endeavored to address this through member checking our findings. Our insider status was likely a strength in terms of participants' willingness to participate and to share openly during the interviews.

Conclusion

While it may be better remembered for other reasons, the year 2020 was designated by the World Health Organization as the "Year of the Nurse and Midwife" and offered an opportunity to highlight the role that midwives play in transforming health care (Edmonds et al., 2020). In their commentary arguing that midwifery-led units are an evidence-based strategy that should be a policy focus arising from the "Year of the Nurse and Midwife-2020", Edmonds et al. called for implementation

research that examines how to design and scale midwifery-led units. Our findings begin to address that call. The example of the MSH-AMU illustrates the value of utilizing best practices with respect to change management and system transformation and demonstrates the potential value of using implementation theory to drive successful implementation of AMUs. In settings where people seek to create new AMUs, the factors outlined in this paper can be used to inform an intentional, strategic approach to implementing this innovation.

Ethical approval

The study was approved the Hamilton Integrated Research Ethics Board (HiREB, protocol #5050) in Hamilton, Ontario, Canada. All participants signed consent forms or provided consent over the phone to participate in the study.

Author contribution statement

ED conceptualized the study. ED and BMD designed the study. ED, LG, RE collected data. ED, CM led analysis, with contributions from RE, LG, AM, BMD. ED drafted the manuscript, which was critically revised by CM, RE, LG, AM, BMD. All authors approved the final version to be submitted and agree to be accountable for the content.

Declaration of Competing Interests

Anne Malott is employed by Markham Stouffville Hospital and works part-time as a hospitalist midwife in the alongside midwifery unit. No other authors have competing interests to declare.

Appendix A

Semi-structured individual interview guide for key informants

1. Tell me about how the MSH AMU came to be.

Prompts, if necessary [please make sure that all of the following are addressed]

Who has been important in making this happen (and why)?

Why do you think MSH is the place where this innovation is occurring for the first time in Canada?

The AMU was a dream for a long time – what factors finally allowed it to be created now?

What were the challenges in creating the AMU?

(Prompts, if necessary: Policies? Organizational structures? Health system characteristics?)

2. From your perspective, what are the benefits of delivering care in this way?

Prompt, as appropriate

What convinced you that the AMU is a good idea?

For champions, please also address, if not already discussed:

Tell me about how and why other people came on board with your vision?

What has influenced the way the MSH-AMU looks and operates (i.e., the structure and processes)?

Other existing AMUs? Research? Contextual factors? Key people? Key ideas?

3. What have been the most important factors influencing how well the AMU is currently functioning?

4. What have been the greatest challenges in implementing the AMU?

5. Have all the benefits you imagined been realized?

If not, why do you think this hasn't happened (yet)?

6. What advice do you have to share with another community, hospital, or group of stakeholders that is interested in creating an AMU?

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