Improved Delivery of Cardiovascular Care (IDOCC): Findings from Narrative Reports by Practice Facilitators

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ABSTRACT

Practice facilitation can help family physicians adopt evidence-based guidelines. However, many practices struggle to effectively implement practice changes that result in meaningful improvement. Building on our previous research, we examined the barriers to and enablers of implementation perceived by practice facilitators (PF) in helping practices to adopt the Improved Delivery of Cardiovascular Care (IDOCC) program, which took place at 84 primary care practices in Ottawa, Canada between April 2008 and March 2012. We conducted a qualitative analysis of PFs' narrative reports using a multiple case study design. We used a combined purposeful sampling approach to identify cases that 1) reflected experiences typical of the broader sample and 2) presented sufficient breadth of experience from each project step and family practice model. Sampling continued until data saturation was reached. Team members conducted a qualitative analysis of reports using an open and axial coding style and a constant comparative approach. Barriers and enablers were divided into five constructs: structural, organizational, provider, patient, and innovation. Narratives from 13 practice sites were reviewed. A total of 8 barriers and 11 enablers were consistently identified across practices. Barriers were most commonly reported at the organizational ($n=3$) and structural level, ($n=2$) while enablers were most common at the innovation level ($n=6$). While physicians responded positively to PFs' presence and largely supported their recommendations for practice change, organizational and structural aspects such as lack of time, minimal staff engagement, and provider reimbursement remained too great for practices to successfully implement practice-level changes.
Trial Registration: ClinicalTrials.gov, NCT00574808

1. Introduction

Understanding and applying best practice evidence is crucial to managing chronic diseases. However, many family physicians exhibit difficulties in keeping up with the latest guidelines (Liddy et al., n.d.). Practice Facilitators (PFs) actively work with practices to assess current processes and assist with goal setting to support practice-level improvement (Liddy et al., n.d.; Laferriere et al., 2012). Practice facilitation has demonstrated effectiveness at improving family physicians' adoption of evidence-based guidelines (Baskerville et al., 2012; Nagykaldi et al., 2005).

Our practice facilitation program, The Improved Delivery of Cardiovascular Care (IDOCC) project, was a stepped-wedge cluster randomized controlled trial in which four trained PFs worked with nearly 200 physicians from 84 family practices in Eastern Ontario, Canada between April 2008 and March 2012. The focus was to improve delivery of evidence-based cardiovascular care for patients at high risk of cardiovascular diseases (Liddy et al., 2014, 2011, 2015). Participating practices were audited to examine their pre-intervention performance in four key areas: screening for disease or risk factors, prescribing, referral to community or self-management support services (e.g. smoking cessation programs), and patients' clinical outcomes (e.g. blood pressure, hemoglobin A1c). PFs provided audit results to each practice and then supported them in making changes towards practice improvements.

Analysis of the IDOCC study found that the intervention did not improve adherence to accepted clinical guidelines (Liddy et al., 2015). Subsequent research (including this study) has attempted to explore possible causes for IDOCC's lack of effect. We conducted interviews with the practice facilitators immediately after the study's completion and identified five common barriers to implementation: organization of the practice, accessibility, engagement, resistance to change, and

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competing priorities (Liddy et al., 2014). Another study examining the perspectives of physicians who had participated in IDOCC found that physicians appreciated having access to a practice facilitator and viewed the intervention positively (Liddy et al., 2016). This final qualitative analysis examines the barriers and enablers of the practice facilitation program through the lens of an implementation framework proposed by Chaudoir (Chaudoir et al., 2013). Recent research has found that theoretical frameworks help contextualize research findings across multiple studies, as they provide a common platform by which individual findings can be judged (Colquhoun et al., 2014; Flodgren et al., 2011; Grol et al., 2007).

Applying this notion to the IDOCC program, we used the Chaudoir implementation of health innovations framework to analyze a subset of practice narratives (i.e. field notes) completed by PFs throughout the duration of the study, allowing us a more in-depth view of the barriers and enablers that affected the study's implementation. This framework was based on a systematic review of the implementation literature in which 62 different measures were identified as predictive of the success of health-care innovations (Chaudoir et al., 2013). Furthermore, this study draws on narrative reports written during the study period, and is thus not subject to the hindsight and recall bias that can influence interview responses. As such, it provides a new lens through which to view the IDOCC program, and will support a richer understanding of the challenges faced during implementation of practice facilitation studies and the development of potential strategies to overcome them.

2. Method

2.1. Design

A multiple case study design was used starting with an analysis of PFs' narrative reports to categorize barriers and enablers (Yin, 2009).

2.2. Population

The IDOCC study was conducted in a health region of Eastern Ontario, Canada comprising approximately 16,000 square kilometers. The region has a culturally diverse population of 1.2 million, roughly half of whom reside in the city of Ottawa and half in the surrounding rural communities. Chronic disease burdens and health outcomes among the population are in line with those of the rest of Canada (Champlain LHIN, n.d.).

To be eligible to participate, physicians had to provide general primary care services for a minimum of two years before the intervention began. Physicians were not compensated monetarily for participating, though they were able to receive continuing professional development credits from the College of Family Physicians of Canada. Ethical approval of the study was provided by the Ottawa Health Science Network Research Ethics Board (2007292-01H).

2.3. Practice Facilitators

PFs included four health professionals with Master's degrees in medical or health science fields and previous clinical/management experience. After joining the project, PFs completed an intensive training course lasting seven weeks, designed to teach quality improvement and change management techniques. PFs worked with 10-15 practices and were expected to visit each practice approximately every 3-4 weeks during the first year and every 6-12 weeks in year two in order to assess progress and provide support (Baskerville et al., 2012).

2.4. Sampling

We applied a combined purposeful sampling approach (Patton, 1990) to select PF narratives for inclusion. Within this combined approach, we began with one sampling strategy and then used additional strategies to help further the focus of the sample. Prior to beginning the study, PFs were instructed to write narratives after every interaction with the practice, during which they observed practice behavior and provided support to improve adherence to clinical guidelines on cardiovascular care. Practice narratives were eligible for inclusion if they were complete (i.e. missing no entries and provided full documentation of all of the PF's encounters with the practice during the study period). Of the 84 practices participating in IDOCC, 76 had a complete set of narratives from PFs. Reports from the remaining eight practices contained instances of unreported visits or incomplete descriptions and were excluded.

"Typical practices" were then selected to bring more focus to the sample. Sum scores were calculated for each practice in which a priority code of 1 (indicating a top priority indicator) was assigned in cases where an IDOCC condition indicator (e.g., diabetes, dyslipidemia, smoking prescription) was scored as 0-50% of the ideal score and more than 10% points below mean value of peers. Practices with mean scores falling at or within +/-1 SD of the total mean scores were considered typical practices and included in the study.

At this later stage of sampling, fifty-one narratives qualified for inclusion, from which a subset of 15 was identified to begin the coding process. To ensure the sample had sufficient breadth, the selected practices included five from each step of the IDOCC program and at least one representing each of the family practice models in the included set. Program steps refer to the randomly-allocated clusters of practices. IDOCC was implemented in one cluster each year over a three year timeframe. Participating physicians belonged to a number of different practice models, which vary in terms of how physicians are paid (e.g. fee-for-service, capitation, or salary) or whether they adopt a team-based model of care. Coding of the subset continued until the thirteenth case, at which point data saturation was reached.

2.5. Chaudoir Framework

Developed from previous review studies examining previous innovations (Durlak and DuPre, 2008; Damschroder et al., 2009), the Chaudoir framework assesses implementation based on concurrent evidence from five constructs: structural, organizational, provider, innovation, and patient (Table 1) (Chaudoir et al., 2013). Since IDOCC was implemented in many practices that adopt a team-based model of care (e.g. family health teams, community health centres) and thus have various allied health professionals on staff, we expanded the definition of the provider construct to encompass the entire healthcare team.

2.6. Data Analysis

Narrative reports were uploaded into NVivo 10 and analyzed using an open and axial coding style (Strauss and Corbin, 1990) and constant comparative techniques. Emerging themes were allocated to the appropriate construct of Chaudoir's framework using a deductive approach. An inductive approach was then used, in which we utilized constant comparison techniques to help identify differences or new variations of sub-constructs emerging from the narratives.

A research assistant coded an initial seven transcripts under supervision of a research associate. The research assistant then coded the remaining manuscripts, which the research associate reviewed for accuracy and relevance. The entire team then reviewed the segments coded in order to reach inter-rater agreement. Any disagreements were addressed through discussion until consensus was reached. The coding process adhered to the measures outlined by The Coding Manual for Qualitative Researchers (Saldana, 2015).

Table 1
Framework of Constructs Affecting Implementation of Health Innovations (adapted from Chaudoir et al., 2013)

Factors (or Constructs)	Definition	Examples (or Sub-constructs)
1. Structural	"The outer setting or external structure of the broader sociocultural context or community in which a specific organization is nested." (Chaudoir et al., 2013, Haines et al., 2004)	• physical environment (e.g., elements that pose barriers to health care access) • political or social climate (e.g., liberal vs. conservative) • public policies (e.g., laws governing health care practices) • economic climate (e.g., funding available) • infrastructure (e.g., access to public transportation).
2. Organizational	"Aspects of the organization in which an innovation is being implemented." (Chaudoir et al., 2013)	• leadership effectiveness • culture or climate (e.g., extent to which an organization values and rewards an innovation) • staff satisfaction or morale.
3. Provider	"Aspects of the [team, practice or group of providers] who implement the innovation with a patient or client." (Chaudoir et al., 2013)	• attitude toward evidence-based practice • perceived control to implement an innovation.
4. Innovation	"Aspects of the innovation that will be implemented". (Chaudoir et al., 2013)	• relative advantage of using an innovation beyond current practices • quality of the evidence supporting the benefit of an innovation.
5. Patient	"Patient characteristics […] that can impact implementation outcomes." (Chaudoir et al., 2013; Feldstein and Glasgow, 2008)	• health-related beliefs • motivation • personality traits • behavioral risk factors (e.g., alcohol misuse) • beliefs and/or attitudes (e.g., trust/mistrust of medical practices).

3. Results

3.1. Site Characteristics

We examined narratives from thirteen sites (Table 2). Practices produced a mean of 19.8 narratives (SD: 6.9). PFs 1 and 4 completed a majority of included reports (n = 5 each). Narratives were an average of two to four pages in length.

Table 2
List of characteristics of 13 practices included in IDOCC Narrative Review

Practice ID	Practice Model	Number of Narratives	PF Assigned Number
P1	HSO	32	1
P5	FHG	29	2
P17	FFS	26	3
P25	CHC	22	4
P31	CHC	23	4
P39	FHN	19	4
P41	FHT	25	1
P42	FHO	18	4
P63	FHG	13	1
P64	FHO	13	1
P79	FFS	12	4
P82	FHT	14	3
P90	CHC	12	1

HSO = health service organization; FHG = family health group; FFS = fee-for-service; CHC = community health center; FHN = family health network; FHT = family health team; FHO family health organization.

A total of eight barriers and eleven enablers were identified as occurring in more than half of all practices.

3.2. Barriers

Of the eight frequent barriers, three occurred in the organizational construct, two in structural, and one each at the provider/team, innovation, and patient constructs.

3.2.1. Organizational

Key organizational barriers were a lack of staff availability or involvement, lack of time, and negative experiences with the electronic medical record (EMR).

Most practices exhibited a lack of staff mix/availability/involvement, with two practices in particular recording these issues numerous times. Practices listed various reasons for staff shortages, such as retirement, medical leave, or relocation.

Lack of time was cited by most practices and commonly attributable to insufficient staff or a large caseload. Some practices noted difficulties in office efficiency: "[The physician] has [a] heavy caseload…he sometimes works until midnight or 1:00am seeing patients without appointments after his regular clinic hours…" (P17)

Most practices described negative experiences with the EMR, such as its inability to extract data or generate registries. Some practices felt that setting up and using the EMR required excessive time and energy. A few others found it generally to be challenging or difficult.

In addition to these frequently cited barriers, a few practices expressed concerns regarding office space as a result of renovations or simply a poor layout, and a couple of practices noted problems with clutter or messiness.

3.2.2. Structural

Key structural barriers involved the availability of resources and the surrounding political and economic climate.

The lack of community resources for patients (e.g. smoking cessation tools, mental health resources) was the most common structural barrier for practices. In a few narratives, long wait lists and distances to travel for services resulted in difficulty accessing specialists for patients.

Most practices reported negative macro-level economic/political environment barriers such as the limitations of their practice payment model, with one physician noting: "as a salaried doctor…there is no incentive … to complete flow sheets as any bonus that would result, would not be received directly." (P01) Some practices reported being negatively distracted by broader community health influences, most notably responding to pH1N1, an outbreak of swine flu that emerged as a pandemic during the study period and required substantial resources for prevention and treatment.

3.2.3. Provider/Team

The key provider/team-level barrier was resistance to change.

Practices often demonstrated negative attitudes towards changing practice behaviors. For example, several practices were unreliable in contacting or meeting the PF, resulting in missed, delayed or rushed meetings, and one practice rejected five different suggestions made by the PF. Several providers exhibited reluctance to change, citing comfort with their current practices or the perception that new strategies will be more time consuming. Several practices raised concerns about team functioning due to tension, turnover, poor communication, and lack of teamwork. Many practices had specific concerns with unclear roles and responsibilities, as in one case where "…the nurses were not being used effectively, they could do so much more" (P90) A few practices had negative or indifferent attitudes toward using community resources, expressing a lack of interest in collaborating with external programs.

3.2.4. Innovation

The key innovation-level barrier was a negative reaction to PFs' involvement and suggestions among some providers.

Although most practices used charting/flow sheets/templates, many providers expressed some reluctance to use them. Reasons for this included perceived duplication of effort, incompatibility with existing IT systems, and a sense that the tools were merely "monitoring for monitoring's sake." (P1) Likewise, several practices expressed reluctance to use reminder systems, considering them time-consuming (particularly without an EMR) or outside the scope of their responsibility: "[The physician] felt that it was not [his/her] role to chase after people—they had to take some responsibility." (P1) Some practices raised issues about the use of self-management, "…self-management groups might not be an approach that would work with many patients because of constraints of time and cultural considerations" (P90). Some providers demonstrated negative attitudes towards PF involvement through a lack of communication, rejection of PFs' advice, or disagreement with the results of the practice audit. In the latter case, practices often indicated that the results underestimated the number of patients with a given condition (e.g., hypertensive patients) on medication and/or questioned the need to measure waist circumference.

3.2.5. Patient

Patient-level barriers were more varied, but the majority pertained to socioeconomic factors.

Some practices underlined "Patients' financial precarity [sic] and high unemployment rates: [The provider] states that many patients are on welfare and feel that they are not able to break out of this cycle of hopelessness." (P05) Furthermore, a small number of practices reported lack of education (i.e. not graduating from high school) and cultural factors as relevant barriers. Indeed, these patients, especially the ones whose first language was not French or English, found the educational material they received to be lengthy and not user-friendly. Other issues included poor access, scheduling difficulties (i.e. miscommunication with booking staff, patients frequently arrived too early or too late and still expected to be seen), high stress resulting from juggling multiple responsibilities (e.g. jobs, childcare), and poor transit. Some practices also reported that patients lack motivation and do not apply self-care strategies to prevent or reduce risks, causing frustration and discouragement for physicians. Furthermore, some practices identified psychological issues (e.g. depression, anxiety disorders, psychosis) as a patient barrier, as physicians must spend extra time with these patients.

3.3. Enablers

Six of the frequent enablers fell under the innovation construct, while two each belonged to structural and provider/team and one to organizational. No enablers were found at the patient level.

3.3.1. Innovation

Key innovation enablers were agreeing with audit recommendations, awareness of processes needing adjustment, a positive view of flowsheets or templates, a positive view of reminder systems, a positive reaction to the PF's involvement, and the PF's capacity to spread the innovation.

Every practice but one appeared to agree with recommendations mentioned in the practice audit, which included recording aspirin in the EMR, populating flow sheets with HbA1c, and measuring waist circumference.

Most practices were aware that processes needed adjustment and willing to try adopting suggested changes. These included launching a new system for recording information, offering more education on self-management practices, and having a diabetes team in the office.

A large majority of practices used flow sheets, particularly for diabetes and cardiovascular disease management. Several sites

acknowledged the desire to accommodate flowsheets within the EMR. Some practices customized flow sheets to better fit their needs.

Most practices reacted positively to reminder systems. Approximately half of the practices planned to implement reminder systems and the other half already issued patient reminders via phone calls or letters. Some practices mentioned the importance of having a registry or EMR to support their recall system.

Most practices appreciated the PF's involvement, particularly regarding resources such as waist circumference measures, low literacy leaflets for Type II diabetes, and foot assessment information. A physician and a nurse in one practice reported: "We really appreciate all the resources you bring for us, these monofilaments are great and the information I will start using right away." (P79)

Lastly, many providers benefited from the PF's capacity to spread information, which enabled them to see which tools worked at other IDOCC sites.

3.3.2. Structural

Key structural enablers were community services and educational or networking resources.

Most practices reported learning about community services from PFs, who "produced guides of what was available in the community especially at low cost." (P90) The most commonly reported resources were local recreational programs (e.g. swimming pools and fitness programs). Resources mentioned less frequently included local walking programs, stop-smoking programs, language/cultural programs, support groups (for aphasia), foot care, specialized clinics (e.g., stroke and rehab) and phone help lines (e.g., smoking cessation).

Most practices mentioned using educational or networking resources, such as attending a conference or workshop on chronic disease self-management. A few practices mentioned macro-level economic/political environment enablers concerning funding or incentives for the practice, particularly the use of the Ontario Ministry of Health and Long-Term Care flow sheets that contained billing codes.

3.3.3. Provider/Team

Key provider/team-level enablers were providers' positive attitudes towards changing practice behaviors and community resources.

Narratives from all practices recounted positive attitudes towards changing behavior. Most practices signaled their readiness for change early on. Several practices reported that they were enthusiastic, eager to proceed and/or open to new ideas, and one practice illustrated a significant change of attitude over time:

> When [the provider] started with the program [the provider] was skeptical because [the provider] thought there was another agenda and… another way of hitting the family doctor over the knuckles and telling them how badly they were doing…However, [the provider] was not quite of the same opinion now. (P01)

Many practices responded positively to community resources, with one PF reporting that the physician "continues to be open to…being informed and using community resources for …patients." (P64)

3.3.4. Organizational

Despite many practices reporting EMR usage as a barrier, EMRs also emerged as a key organizational enabler among some practices.

Practices where EMR emerged as an enabler cited potential advantages such as making recall and registries possible and keeping an accurate track of records. A physician even left his practice during the IDOCC program because "…he had had enough of paper charts and was going …where they had an EMR." (P1) The majority of practices used an EMR for patient tracking (e.g. obtaining lists of diabetic patients or identifying high risk patients), flow sheets, referral/recall, and downloading patient forms. Several practices sought information from PFs about using an EMR/IT, such as what operating systems, software programs, and

applications were needed. Some practices also planned for or participated in EMR training/education. Others began IDOCC without EMRs and implemented them throughout the course of the project. Regarding staff involvement, several practices appreciated having access to interdisciplinary team members including physicians, nurse practitioners, chiropodists, and dietitians. Some also mentioned that providers actively engaged in activities to support the IDOCC program. Some practices reported good efficiency, which included a streamlined charting process and better planning for patient visits. Improved office space was also linked to efficiency in a few practices. Some practices allocated an individual (e.g. nurse, clinical coordinator) as a lead for the IDOCC trial. Lastly, some practices mentioned educational interests/involvement within the practice related to IDOCC, including training sessions, network meetings to share knowledge and strategies, and formal and informal presentations on various IDOCC related topics.

4. Discussion

Implementing practice-level change for quality improvement in primary care—even with the support of a practice facilitation program—is challenging. Our findings identified multiple barriers and enablers aligning with each construct under Chaudoir's framework.

Barriers were most common under the organizational construct, which included deficiencies in time or clinic space, lack of staff interest, and disorganization—factors cited as barriers in other quality improvement studies (Solomons and Spross, 2011; Luxford et al., 2011). Negative experiences with EMRs were also raised as a major organizational barrier. Many of our practices had either just implemented or were in the process of implementing an EMR, which affected physicians' availability and attitude towards the use of electronic practice improvement tools such as disease registries and flow sheets (Solomons and Spross, 2011; Luxford et al., 2011). However, the presence of strong, committed leadership has been identified as a key organizational enabler that can mitigate organizational barriers by maintaining strategic direction and ensuring resources are directed to support the innovation (Luxford et al., 2011; Poon et al., 2004; Russ et al., 2015; Sinkowitz-Cochran et al., 2012). Interestingly, an enabler emerging from the organizational construct involved leadership at a staff level, wherein a nurse or clinic coordinator was allocated the role of IDOCC lead and responsible for guiding implementation of the intervention. This suggests that leadership is important not solely as downward pressure from a place of authority, but as a centralized role to help with the logistics of implementation. Previous studies of health care innovations have reported similar findings, with the appointment of a clinician or staff champion positively associated with successful adoption (Poon et al., 2004; Russ et al., 2015).

Enablers were most common under the innovation construct, which covers such aspects as the perceived effectiveness of the intervention and the quality of evidence supporting its use (Chaudoir et al., 2013). However, this evidence base is not sufficient to accurately predict its level of success during implementation (Damschroder et al., 2009). As many as two-thirds of quality improvement initiatives fail, irrespective of the evidence supporting them (Burnes, 2004). Likewise, while previous research suggests that many providers were satisfied with the IDOCC practice facilitation program (Liddy et al., 2016), barriers reported in other constructs may have resulted in the study's null effect (Damschroder et al., 2009).

4.1. Limitations

Our study has several limitations. The number of barriers and enablers identified was dependent on the narratives the PFs generated during the study, with some providing more details than others. This information is self-reported and therefore depends on PFs' perceptions and relationships with members of the practice. It is possible that providers' positive responses to PFs' involvement account for the innovation-level enablers we reported, but the organizational barriers

remained too great for practices to successfully implement practice-level changes and improve adherence to cardiovascular disease guidelines (the primary outcome of the IDOCC program). Understanding these factors would provide invaluable information on how to optimize the implementation of practice facilitation interventions, and they should therefore be the subject of further study. Our analysis did not explore interplay between constructs. Furthermore, our study did not explore the association between specific barriers/enablers and outcome performance or practice characteristics given that the sample represented the "average practice" in our study. We did not identify any patient-level enablers. One reason for this may be that PFs did not interact with patients directly during their practice visits. An evaluation of program implementation from the patient perspective may yield greater insight into patient-level enablers. Finally, due to the qualitative nature of the research, generalization of the findings to wider populations is limited.

5. Conclusion

The use of the Chaudoir implementation framework provides a comprehensive picture of the barriers and enablers experienced within the IDOCC practice facilitation program. Practice facilitation continues to be used to support quality improvement in primary care. It is viewed positively by providers yet can be limited in impact if organizational and structural aspects of care delivery within a health care community are not well aligned with the quality improvement goals. The findings from this study highlight the complexities primary care providers and their patients face when attempting to adopt multiple clinical prevention guidelines. A strong committed leadership and imbedded local champions within a practice should be an integral part of any quality improvement initiative to promote success.

Competing Interests

The authors declare that they have no competing interests.

Transparency document

The Transparency document associated with this article can be found, in online version.

Funding

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