Family Physician Quality Improvement Plans: A Realist Inquiry Into What Works, for Whom, Under What Circumstances

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Introduction: Evaluation of quality improvement programs shows variable impact on physician performance often neglecting to examine how implementation varies across contexts and mechanisms that affect uptake. Realist evaluation enables the generation, refinement, and testing theories of change by unpacking what works for whom under what circumstances and why. This study used realist methods to explore relationships between outcomes, mechanisms (resources and reasoning), and context factors of a national multisource feedback (MSF) program.

Methods: Linked data for 50 physicians were examined to determine relationships between action plan completion status (outcomes), MSF ratings, MSF comments and prescribing data (resource mechanisms), a report summarizing the conversation between a facilitator and physician (reasoning mechanism), and practice risk factors (context). Working backward from outcomes enabled exploration of similarities and differences in mechanisms and context.

Results: The derived model showed that the completion status of plans was influenced by interaction of resource and reasoning mechanisms with context mediating the relationships. Two patterns were emerged. Physicians who implemented all their plans within six months received feedback with consistent messaging, reviewed data ahead of facilitation, coconstructed plan(s) with the facilitator, and had fewer risks to competence (dyscompetence). Physicians who were unable to implement any plans had data with fewer repeated messages and did not incorporate these into plans, had difficult plans, or needed to involve others and were physician-led, and were at higher risk for dyscompetence.

Discussion: Evaluation of quality improvement initiatives should examine program outcomes taking into consideration the interplay of resources, reasoning, and risk factors for dyscompetence.

Keywords: multisource feedback, physician performance, quality improvement, realist evaluation, physician dyscompetence, physician competence

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The design of formal and informal continuing professional development (CPD) activities to optimize workplace outcomes has proven challenging to those involved in educational design, whether their work resides in an educational organization, regulatory authority, or professional organizations, leading a group of researchers to conclude there were no magic bullets that would ensure physician performance.[1] Very often, the results of interventions fall below expectations in behavioral change and patient outcomes.[2]

Evaluation studies typically assess whether interventions generally work but fail to recognize differences across contexts and the mechanisms involved. Contemporary approaches to evaluation, including the Kirkpatrick New World Model, recognize the complexity of interventions and acknowledge the impact that learner characteristics as well as organizational resources and activities have on the successes (or failures) of programs.[3,4]

Realist methods offer a theory-driven approach to evaluation and synthesis based on generating and exploring evidence theory configurations. This approach explicitly recognizes that interventions do not in and of themselves directly create change, rather it is how people react to the resources that an intervention makes available. In a nutshell, realist evaluation is a method for generating, refining, and testing theories of change by unpacking what works, for whom, under what circumstances, and why.[5,6]

Examinations of quality improvement (QI) programs have shown that outcomes depend on multiple mechanisms but are likely to be more effective when goals are clear and explicit, recipient-defined, and time-bound; involve interaction and facilitation, include multiple methods and exposures, action plans and content physicians deem important and under their control.[7,8] These mechanisms seem to facilitate physician engagement and reflection enabling them to determine how they might undertake the work necessary to make changes in practice.[9–12] Despite this, outcomes will vary based on contextual factors[13,14] including those that put physicians at risk for

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competence/dyscompetence, namely transitions, international graduation, age, and solo practice.[15]

The purpose of this realist inquiry study was to use empirical data to examine the outcomes of a multifaceted physician QI program which required physicians to implement action plans, taking into consideration both mechanisms and contexts that enabled those plans. Specifically, this study sought to understand how the completion status of action plans physicians created (outcomes) were influenced by feedback data, facilitated discussions with a peer, and the physician's reasoning (mechanisms) within the context of risk factors for dyscompetence (context).

METHODS

Study Design

For this mixed methods study, we used the realist framework developed by Dalkin et al.[16] In addition to describing and relating outcomes, mechanisms, and context, this framework decomposes the concept of mechanism into two constituent parts—aspects related to resources that become available through the intervention and how they may affect reasoning of those undergoing the intervention. This disaggregation helps to clarify the distinction between context and mechanism. Figure 1 shows a depiction of the model. In this type of realist analysis, a goal is to look for patterns and explanations across data sets keeping the theoretical underpinnings of this study in mind.[5,17] In our reporting, we followed the RAMSES II guidelines which were developed primarily for literature evaluations.[17] This guideline uses a checklist to verify that those undertaking realist evaluations ensure that they have a title that identifies the document as a realist evaluation; provide a summary or abstract; have a full introduction to this study, including the evaluation questions/objectives/focus for this study; a detailed methods section; results that describe participants and main findings; a discussion; conclusions and recommendations; and information related to funding and conflict of interest.

Theory

The theoretical framework was workplace learning recognizing not only its importance in providing feedback but also that practitioner's take away different learning from similar experiences, given the variability of their previous experiences, training, and professional development.[18,19] Nonetheless, regulators, professional and health care organizations, and CPD providers have demonstrated impact in QI initiatives when feedback data are coupled with facilitation to enhance performance in the workplace.[20–22]

Physicians were required by a regulatory body to participate in the Multisource Feedback+ (MSF+) QI program. As part of this program, physicians engaged in the Medical Council of Canada's MSF program (MCC 360) receiving questionnaire-based data from physician colleagues, nonphysician coworkers, patients, and a self-assessment. In addition to the MCC 360 component, the regulatory body added in a + component designed to improve opioid/benzodiazepine prescribing. In addition to MCC 360 data, they also received provincial health data about their own opioid/benzodiazepine performance along with comparator data. Physicians also received information about their practice (eg, the College of Physicians and Surgeons of Alberta [CPSA] data about patient volume and hours spent seeing patients) along with comparator data. The MCC 360 component contained quantitative ratings for 25 items from patients, 28 from medical colleagues and coworkers, and 37 from self and qualitative comments from patients, colleagues, and coworkers. Ratings focused on the CanMEDS Roles of professional, communicator, and collaborator because these were seen to be the best fit for MSF which relies on the assessment of observable behaviors and these roles are frequently identified as sources of complaints about physicians.[23,24] Recognizing best practices in MSF and feedback, a narrative component was added in which respondents could provide data on what the physician does well and could do better along with a facilitated discussion with a peer family physician appointed by

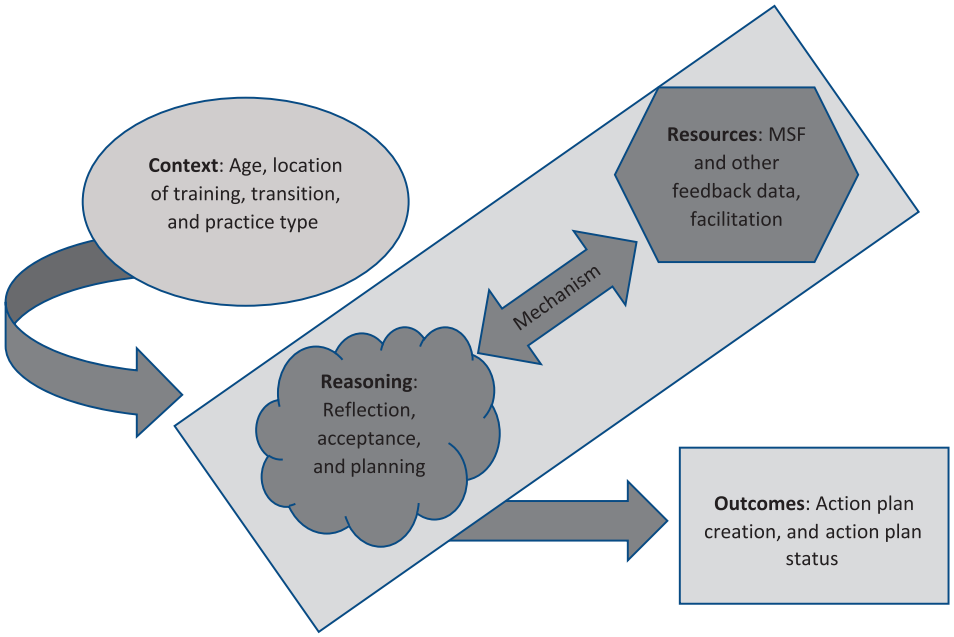

FIGURE 1. Realist evaluation model using the Dalkin et al[16] model.

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the regulatory authority.[25–27] The facilitation was based on the relationship, reaction, content, and coaching (R2C2) model which is evidence-based and theory-driven incorporating an understanding of self-assessment, cognitive influences, person-centered approaches, and commitment to change.[12] R2C2 recognizes the key role that facilitators can play in effecting change.[12,27–30] The adoption of the R2C2 model along with data and a facilitated discussion has shown that the quality of the debrief would increase and physicians would engage with facilitators in a relationship-centered approach.[31,32] Finally, physicians were required to develop up to three action plans that would be submitted to the regulatory authority and followed up six months later by the physician identifying whether the plans had all been completed, at least one completed, or none.

Given the program components, we believed that the outcomes of the action plan (ie, completion status) would be a product of program resources and physician reasoning (mechanisms) and physician's dyscompetence risk factors (context).

Participants

As part of a research program to gather validity evidence for the MSF+ QI program, we created a deidentified data set of MSF ratings and comments for 325 randomly chosen family physicians, with linked action plans and facilitator reports for 159, and survey results following up on plan implementation status for 93 physicians.[33] Using the MSF data, action plans, and facilitator reports for the 159 linked physicians, we identified high-frequency words and explored content relationships across program components.[34] The results indicated moderate to strong content consistency across components providing evidence of content coherence across program elements. However, this study did not include follow-up data regarding what physicians were able to implement postprogram.

For this study, we drew on data from 50 physicians, with complete data, selected from this larger data set who took part in the CPSA's MSF+ QI program. In recognition that learning occurs during, on refection, and through making and carrying out the action plans associated with quality improvement, participating physicians were eligible to claim up to three CPD credits per hour from the Royal College of Physicians and Surgeons of Canada or the College of Family Physicians of Canada (Mainpro+) for an average of up to 12 credits.

Data and Data Procedures

We had access to multiple data sources and data points for each physician (see **Table 1**, **Supplemental Digital Content**, http://links.lww.com/JCEHP/A172 for a description of the MSF+ Quality Improvement Program phases, data sources, and data description). This included the action plans and the completion status for each action plan (outcomes), MSF and prescribing data (resource mechanisms), facilitator reports, and action plans which the physicians submitted after facilitation in which they provided two to three detailed action plans. The action plans described the physician's goals, anticipated benefits, barriers, enablers and anticipated timeline (reasoning mechanisms), and dyscompetence risk factor data (context).

For outcomes, we drew on self-reported data at 6 months for the action plans in which they indicated the status of each plan as "all completed," "at least one completed," or "none completed." We divided participants into three groups based on the status of their action plans.

For resource mechanisms, we examined the MSF and prescribing data including quantitative ratings and qualitative rater comments regarding one thing this physician does well and one thing this physician could do better for each of the respondent groups. Using the quantitative ratings, we calculated mean ratings across MSF survey items, within each rater group to create a total score. The total score was then used to calculate total *Z*-scores. These values reflect the difference between the mean ratings across all items, and all raters in a respondent group for an individual physician compared with the average for all physicians in the data set of 325 in standard deviation units. Negative scores indicate that a physician was rated below the average rating for cohort of 325 physicians, whereas positive scores indicate that an individual physician was rated above the average for the cohort of 325 physicians. Then, we examined how heavily the physicians drew on each of the available data sources in their reports to create action plans including quantitative and qualitative MSF data, prescribing feedback data, and other sources that included practice feedback data or other data whose source we could not determine. To examine the pattern and/or quality of MSF data, we explored both the relative value of ratings that physicians received (ie, *Z*-scores) and the consistency or degree of overlap of feedback messages received through MSF ratings, comments, or a combination of these. The effect of MSF feedback consistency on planning content was determined by examining the number of repeated feedback messages for each group by assessing the number of times an MSF item with lowest respondent rating or comment about what this physician could do better aligned with the theme of the physician's action plan.

For resource reasoning, we drew on the two-page facilitator reports summarized in the one-hour phone conversation between the physician and feedback facilitator which summarized the discussion of the report content including the physician's reactions to the data and their plans. We coded each plan into one of two groups: *simple* for those that could be accomplished by completing one or two actions and involved factors that were under the physician's direct control or *difficult* for those that would involve more extended effort or resources and often depended on factors that were not directly under the physician's control. Using the facilitator report, we explored how the choice of what to target for improvement was initiated because the reports documented whether the physician reviewed their report and whether they had identified areas for inclusion in action plans before the meeting. The report also documented areas where the coach was more directive in suggesting areas to target for QI. We mapped the content of facilitator reports against the action plans and coded them as physician-led (created by physician before or separate from coaching session and reflected in plans), coach-initiated (not reflected before coaching, suggested by coach, and reflected in plan), or cocreated (discussed during coaching and reflected in plans). Finally, we drew on physicians' anticipated timelines for completion action plans and coded for before 6 months, 6 months or more, or indeterminate based on their response (eg, "over time, no specific measurable time").

For physician context, we had demographic data from the facilitator reports and the CPSA's data and drew on the risk factors for dyscompetence in this analysis including age, Canadian or international medical school training, transitional information (eg, planning to retire, doing locum work, and recent change in practice location), and solo practice.[15]

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In analyzing the data, we worked backward in an iterative way from outcomes to explore the similarities and differences in factors related to resources and reasoning mechanisms and context. We ensured rigor by having all members of the research team conceptualize the study's design and the data which would be included for each of the context, mechanism, and outcome components, and two members of the research team reviewed all data and developed the initial coding framework based on subsets of data from 10 (M.R. and J.L.). We reviewed the framework as a group (M.R., J.L., and C.T.), and then two members reviewed an additional 20 physicians (M.R. and J.L.); one member applied all the coding (M.R.), while a second member applied coding for a subset of the data for 20 physicians (J.L.). All members reviewed the findings for subsets of 10, 20, and then the 50 physicians (M.R., J.L., and C.T.) and recommended adjustments as necessary through regular team meetings.

The Ottawa Health Science Network Research Ethics Board approved this study.

RESULTS

The 50 physicians identified a total of 142 plans (M = 2.82, SD = 0.44). Thirteen physicians (26%) had completed all 36 of their plans, 18 (36%) had completed at least one of their 52 plans, and 19 (38%) had not yet completed any of their 54 plans. Of the 142 individual plans created, physicians reported 63 (44%) have been completed, 66 (47%) were in progress, and 13 (9%) had not yet been started 6 months after facilitation. Table 1 summarizes themes, subthemes, and frequencies for all 142 plans. Most plans were themed within the roles targeted by the MSF tool with most addressing the communicator role (n = 57, 40%), followed by professional (n = 38, 27%) and collaborator (n = 32, 23%) roles. Another 15 (10%) described plans were related to opioid/benzodiazepine prescribing.

Resource Mechanisms

Physicians drew on all available data sources in their reports to create and implement action plans as presented in the top portion of Table 2. Given that more than one data source (eg, MSF quantitative ratings and qualitative comments) could be used to inform the same action plan, the numbers in Table 2 sum to more than the total number of action plans developed. Across all three groups, physicians made heavy use of some form of MSF data (between 74% and 89%), including both quantitative ratings (between 12% and 38%) and qualitative comments regarding "*one thing that the physician could do better*" (between 23% and 51%). Feedback about opioid/benzodiazepine prescribing behaviors (between 2% and 15%) and other sources (between 8% and 11%) described to the facilitator was used by a smaller percentage of physicians within each group. Physicians who completed all their plans were approximately twice as likely to use MSF comment data to inform their plans (51%) than those who were in process of implementing (23%) their plans or had not yet completed any (29%).

Next, we examined how the pattern and/or quality of MSF data varied across the three groups. We explored both the relative value of ratings that physicians received from each respondent group (the middle of Table 2) and the consistency or degree of overlap of feedback messages received through MSF ratings, comments, or a combination of these (the bottom portion of Table 2). The middle of Table 2 presents the mean MSF Z-score rating by each respondent group and plan completion status. The self-ratings for those who completed all their

TABLE 1.

Themes and Subthemes for 142 Action Plans Created by 50 Physicians

Theme	Subtheme
Collaborator	Improve communication with colleagues/coworkers (eg, share information/knowledge, discuss issues, and availability), n = 14
N = 32	Improve documentation and documentation systems (eg, legible handwriting, use electronic resources, improve information technology skills, implement an electronic medical record system and develop referral tracking system), n = 13
	Ensure clear handover of patients between providers, n = 4
	Accept more patients, n = 1
Communicator	Ask about and counsel patients about prescription and nonprescription medications, n = 18
N = 57	Communicate information about resources available to patients, n = 17
	Notify patients of office hours, after-hours coverage, wait times, and accessibility, n = 15
	Involve patients in their own care, n = 2
	Complete patient forms in a timely manner, n = 2
	Improve patient communication by asking patients to express concerns and providing information about preventive care at times other than annual examination, n = 1
	Advise patients that the practice includes residents, n = 1
	Improve patient access to laboratory and x-ray results after emergency room visit, n = 1
Professional	Improve efficiency/better time management (eg, spend more time with patients, be punctual, reduce wait time, and improve patient flow systems), n = 13
N = 38	Increase participation in continuing professional development (eg, attend courses and read more broadly around cases), n = 7
	Improve work/life balance, n = 6
	Wash hands in visible ways, n = 5
	Improve patient privacy/confidentiality, n = 2
	Improve medical education teaching (eg, increase contribution, balance teaching, and patient responsibilities), n = 2
	Develop organized approach to difficult clinical scenarios, n = 1
	Debrief critical incidents, n = 1
	Increase accessibility and availability, n = 1
Opiate/Benzo	Manage patients on opiate/benzodiazepine prescriptions (eg, reduce prescriptions, improve counseling, and review feedback reports), n = 15
N = 15	

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TABLE 2.
Resource Mechanisms and Outcome Status of Plan Completion

	Plan Completion Status		
	All Completed	At Least One Completed	None Completed
Frequency and percentage breakdown of source of feedback			
MSF—lowest rated item	6 (12%)	6 (13%)	18 (27%)
MSF—other rated item	12 (26%)	18 (38%)	20 (30%)
MSF—comment do better	24 (51%)	11(23%)	19 (29%)
Prescribing*	1 (2%)	7 (15%)	4 (6%)
Others	4 (9%)	5 (11%)	5 (8%)
Average total MSF *Z*-score rating by the respondent group			
Self	0.05	−0.23	−0.34
Physician colleague	−0.17	0.24	0.30
Nonphysician coworker	−0.44	0.56	0.14
Patient	−0.60	−0.17	0.33
Translation of messages into action plans			
Average number of repeated MSF messages	6.46	4.44	2.53
Average number of MSF messages translated into plans	3.0	2.11	1.32

*The numbers above sum to more than the total number of action plans developed as multiple data sources (eg, MSF quantitative ratings and qualitative comments) could be used to inform the same action plan. Prescribing practices were specific to opioids and benzodiazepines.

MSF indicates multisource feedback.

plans were relatively higher than other physician self-ratings but were rated by colleagues, coworkers, and patients relatively lower than those in the process of completing their plans or who had not yet completed any plans.

The bottom of Table 2 presents the mean number of repeated feedback messages in a physician's report by completion status and the number of such messages that aligned with the physician's action plan(s). This latter figure refers to the number of times an MSF item with the lowest respondent rating or comment about *what this physician could do better* aligned with the theme of a physician's action plan. For example, physician 21 received the following comments from their physician colleagues, "*Punctuality*," "*X is a great worker but not very punctual,*" "*Punctuality,*" and from patients, "*to be on time,*" "*making wait time shorter,*" and "*wait time.*" When prompted to describe a specific, observable change that the physician intended to make based on feedback, this physician response was "*to improve being at the clinic on time and booking patients in longer spots*." The table also presents that for all three groups, approximately 50% of repeated feedback messages were translated into action plans. The group that completed all their plans received the highest number of MSF messages that related to similar messaging on average (n = 6.46). Those who had not completed any of their plans received the fewest overlapping messages (n = 2.53).

Reasoning Mechanisms

We considered how the difficulty of action plans differed for the three groups. An example of a simple plan was to increase patient awareness of after-hours coverage by posting a sign in the waiting room. By contrast, an example of a difficult plan was succession planning of practice for personal and professional well-being (Table 1). The top of Table 3 presents that physicians who completed all or some of their plans tended to

TABLE 3.
Reasoning Mechanisms and Outcome Status of Plan Completion

	Plan Completion Status		
	All Completed	At least One Completed	None Completed
Plan difficulty			
Simple	19 (53%)	25 (48%)	19 (35%)
Difficult	17 (47%)	27 (52%)	35 (65%)
No. of plans	36	52	54
Plan creation			
Physician-led	2 (15%)	5 (28%)	12 (63%)
Facilitator-led	2 (15%)	5 (28%)	1 (5%)
Coconstructed	9 (69%)	8 (44%)	6 (32%)
No. of physicians	13	18	19
Anticipated time to completion			
Before 6 mo	24 (67%)	27 (52%)	26 (48%)
Six months or longer	3 (8%)	14 (27%)	13 (24%)
Coconstructed	9 (25%)	11 (21%)	14 (26%)
No. of plans	36	52	54

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identify simple changes about half the time (53%), whereas those who had not completed any of their plans were somewhat more likely to identify more difficult changes (65%).

Our exploration of the impact of those who initiated or led the choice of actions for QI shows that the group who completed all their plans largely coconstructed their plans during the facilitation session (69%). By contrast, the group of physicians who had not completed any of their plans tended to have plans that were led by the physician (63%) as presented in the bottom of Table 3.

The bottom of Table 3 presents the physician's anticipated time to completion of each of the 142 plans 6 months after facilitation by the reported completion status. This information provides some insight into how accurately physicians were able to estimate the time it would take them to complete their plans. Estimates made by the group of physicians who were able to complete all their plans (n = 13) were quite accurate in determining the time frame for completion with 24 (67%) plans, correctly projected completion before six months, 3 (8%) projected completion around six months or later, and 9 (56%) providing indeterminate estimates. Estimates made by the group of physicians who had yet to complete any of their plans (n = 19) were quite poor at anticipating time to completion. This group accurately estimated that they would require 6 months or more to 13 (24%) of their plans but inaccurately estimated that they could complete 26 (48%) of their plans before six months and provided indeterminate estimates for 14 (26%) of their plans.

Physician Context

Finally, we explored the impact of contextual factors for dyscompetence risk. Table 4 summarizes the number and per cent of physicians who were 70 years or older, who were international graduates, in transition (eg, retiring, new to practice, returning to practice after a break), and in a solo practice. Although the differences between groups was not large, physicians who had not yet completed their plans were consistently more likely to have risks for dyscompetence than those who were able to implement their plans. For example, the following excerpt is from the facilitator's report for physician 23 who was in transition and unsuccessful in implementing any of her plans:

> Dr. W is currently on her second maternity leave but is planning to return to her practice within the next month. She initially locummed in X for 6 months and then moved back to Y, where she locummed again and worked in inner city medicine briefly. She then took a maternity leave and started working [at site Z] as well as doing low risk Obstetrical call at a new hospital in [urban centre]. She arranges coverage easily when she needs to or wants to take time off. She feels happy with her current work-life balance. . .

By contrast, those who were able to implement their action plans within a 6-month window tended to be well into their career and have an established group practice and/or colleagues or coworkers with whom they have established collaborative relationships. For example, the following excerpt is for physician 17:

> This is an experienced physician in his 50s who has been in practice for over 25 years. He works half time for a large group practice and half time at a nursing home. He does full family practice care including walk-in and he rounds at the nursing home and does call for the nursing home.

Those who completed a subset of their plans either tended to have targeted difficult changes or were in practice settings that did not provide resources to support change. For example, the following excerpt from the facilitator's report is for physician 36 who had completed one of his two plans:

> Dr. X. is an IMG (international medical graduate) who graduated from X and did further fellowship training abroad. Dr. X then moved to Canada and practised as a GP. Dr. X started a solo practice from 2006 till present. Dr. X is unique in the sense that he still runs a paper chart clinic. The clinic personnel only comprises him and his receptionist. There is limited use of [other community] resources. . .

TABLE 4.

Frequency of Competence Risk Factors by Outcome Status of Plan Completion

	Plan Completion Status		
Risk Factors	**All Completed**	**At least One Completed**	**None Completed**
Age (70+)	3 (23%)	2 (11%)	6 (32%)
International graduate	3 (23%)	5 (28%)	7 (37%)
In transition	4 (31%)	7 (39%)	7 (37%)
Solo practice*	3 (25%)	3 (18%)	5 (29%)
No. of physicians	13	18	19

*For solo practice, there was one missing response from the "all implemented" and "at least one implemented"; two responses were missing from the "none implemented" groups.

Relationships Between Outcomes, Mechanisms, and Context

Two main configuration patterns between outcomes, mechanisms, and context emerged. First, physicians who completed all their plans within six months (outcomes), were more likely to have received feedback data with consistent or clear messaging (resource mechanism), reviewed and considered that data ahead of the facilitation were able to coconstruct an action plan with the facilitator, were more accurate in determining time required to complete (reasoning mechanism), and had fewer risks for dyscompetence (context). The total Z-score results indicate that this group of physicians rated themselves relatively higher and were rated by others relatively lower (resource mechanism) than the remaining groups. Second, physicians who were unable to implement any of their plans were more likely to have data with fewer repeated messages, and they did not translate these into plans (resource mechanisms), had plans that depended on the involvement of others or were difficult and physician-led, provided less accurate or indeterminate times to completion (reasoning mechanism), and the physicians were at higher risk for dyscompetence (context).

DISCUSSION

The purpose of this study was to build and refine theory around understanding how to support workplace learning efforts in a CPD program context using a realist evaluation framework.

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This study confirmed the utility of drawing on the model by Dalkin et al[16] (as shown in Fig. 1) to explore the outcomes of QI action plan completion at 6 months taking into consideration the role of both resources and reasoning mechanisms and contextual factors. By detangling resources and reasoning, we had a clearer picture of how these mechanisms affected the completion of plans while considering risk factors for dyscompetence which mediated the relationship between resource and reasoning mechanisms and outcomes. Considering that realist inquiry focuses on what works, for whom, and under what conditions, we identified that while physicians were able to initiate most plans, completion status was variable. The best outcomes (ie, completion of all plans) were experienced by physicians who were in group practice, had graduated from a Canadian school, and were in stable practices but also were physicians who had more quantitative data that were aligned with their narrative comments and who coconstructed their plans with a facilitator.

This study examined how one could effect change in the workplace with evidence and theory-informed interventions. It provided a better understanding of the interplay between the context, mechanisms, and outcomes of complex workplace-based learning interventions. Some aspects of the intervention were controllable, such as providing physicians with numeric and narrative data to guide practice, and having physicians meet with trained facilitators who could review the data objectively and coach physicians in the cocreation of action plans. Other aspects were beyond the ability of the organizers to control, such as the numbers of repeated messages, the alignment of quantitative and narrative data, whether the physicians tried to implement simple or difficult action plans, and the role that facilitators played in the creation of plans. These mechanisms, both positively and negatively, affected completion. This study also suggests that successful MSF programs need to be multifaceted and include quantitative and qualitative data, peer facilitation, and detailed action planning to enact change.

Variability in outcomes related to mechanisms is not entirely unexpected and reinforce findings from both the QI and CPD studies.[35] For example, the benefits of repeated feedback messages particularly from multiple sources on feedback acceptance and use have been demonstrated.[34,36] Consistent feedback may be perceived as more credible or important and may be more likely to be discussed and explored during the facilitation session.[37] The addition of narrative comments provides context to numerical ratings through the description of specific examples related to a behavior.[38] Furthermore, feedback recipients report being more satisfied with feedback that includes narrative information and report greater tendency to use such feedback to make future improvements.[25]

The value of facilitation and coaching for accepting, interpreting, and using feedback data to inform change is supported in other studies.[12,27,32] Primary care practices have been shown to adopt the evidence-based guidelines after practice facilitation.[39] An examination of specialist physician e-portfolio data showed that discussing plans for making improvements with a peer or supervisor was an important component of planning practice changes.[40] Work in implementation science has identified facilitation as the primary mechanism required for the successful implementation of new knowledge into clinical practice.[29]

We noted that coconstructed plans were more likely to be completed than facilitator-led or physician-led plans, suggesting that constructive dialog supports data reflection, acceptance, and being able to create actionable plans. This finding is similar to an analysis of R2C2 data with residents which showed that supervisors able to establish a collaborative coaching dialog, using communication micro skills to promote reflection, and clarify the resident's understanding of both content and context were more likely to codevelop the action plans. This was in contrast to supervisor-led plans which were less likely to be completed.[27]

Finally, our findings regarding the mediating influence of context on implementing change are echoed in the literature showing that the implementation of any type of intervention is complex, dynamic, and influenced by a variety of contextual factors. We examined four factors that have been identified as risk factors for dyscompetence.[15] Of these, two are ones that the physicians can possibly control (eg, solo practice and transitions), and the other two are ones the physicians cannot control (eg, school of graduation and age).[15] We found that these factors affected action plan completion. However, although these are risk factors, they are not causal; continuing medical education participation, educational information, personal support, quality assurance participation, and support through structure or organization have been shown to mitigate the risks.[15]

There are several limitations to consider in this study. For pragmatic reasons, we selected the first 50 physicians whose data were complete; there may have been different findings with a larger or different sample. We analyzed 142 action plans for this study. This number limited the level of detail with which we were able to characterize plan difficulty and estimates of time to completion. The action plans' completion status was self-reported by physicians. Although we collectively reviewed and analyzed the data, others may have interpreted the data related to physician reasoning differently. Furthermore, the facilitator reports were summaries of the actual discussion from which we inferred reasoning mechanisms, and given that copies were sent back to both physician and Y, the choice and content may have been somewhat selective. In addition, we limited our examination of context to the more frequently examined risk factors for dyscompetence because these were available for almost all the physicians and known to be of concern to regulatory and health care organizations.[15] Finally, it is important to keep in mind that this QI activity involved the medical regulatory authority which may have increased compliance over a group of physicians who volunteered for this type of QI program and biased our findings.

The finding that physicians who completed all their plans rated themselves more highly than their peers is intriguing and warrants further research. One possible explanation is that these physicians had higher levels of self-confidence and/or self-efficacy which may have predisposed them to take a more active part in implementing their plans. However, we do not have any data to address this in this study. The data in this study indicated that 50% of repeated feedback messages were translated into action plans; however, this also means that 50% of repeated messages were not. Logically, there could be many reasons for this, and we have some uncovered important clues that relate to creating an actionable plan including difficulty and available resources. However, there are likely many factors (eg, physician insight) that could be important, and this is something to follow-up on in future research.

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CONCLUSION

This realist inquiry study extends our understanding of the impact of QI work performed in many contexts. Those supporting physicians should define their end point(s) in quantifiable ways and ensure that interventions draw on evidence and theory-based approaches, while considering how physicians' contexts might affect on physicians reaching their goals. Our study, which focused on the creation of action plans after an intervention that provided physicians with performance data, showed the importance of consistent messaging from different perspectives supported by narrative comments and facilitation. For physicians who may be considered at risk, it may be important to provide additional support and coaching to ensure that the physician understands the data and can identify people and resources that will help them achieve their action plans in a timely way.

Lessons for Practice

- Realist evaluation methods can inform the design, delivery, and evaluation of complex continuous professional development activities.
- Peer facilitation supports physician understanding of data and implementation of action plans in the workplace.
- Attention to context, resources, and reasoning mechanisms in evaluation helps clarify what is working, for whom, and under what conditions.

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