Measurement and Monitoring of Safety Framework: a qualitative study of implementation through a Canadian learning collaborative

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ABSTRACT

Background The Measurement and Monitoring of Safety Framework (MMSF) aims to move beyond a narrow focus on measurement and past harmful events as the major focus for safety in healthcare organisations. There is limited evidence of MMSF implementation and impact.

Objective We aimed to examine participants' perspectives and experiences to increase understanding of the adaptive work of implementing the MMSF through a learning collaborative programme in diverse healthcare contexts across Canada.

Methods The Collaborative consisted of 11 teams from seven provinces. We conducted a qualitative study involving interviews with 36 participants, observations of 5 sites and learning sessions, and collection of documents.

Results Collaborative sessions and coaching allowed participants to explore reliability, sensitivity to operations, anticipation and preparedness, and integration and learning, in addition to past harm, and move beyond a project and measurement oriented safety approach. Participants noted the importance of time dedicated to engaging stakeholders in talk about MMSF concepts and their significance to their settings, prior to moving to implementing the Framework into practice. While participants generally started with a small number of ways of integrating the MMSF into practice such as rounds or huddles, many teams continued to experiment with incorporating the MMSF into a range of practices. Participants reported changes in thinking about safety, discussions and behaviours, which were perceived to impact healthcare processes. However, participants also reported challenges to sharing the Framework broadly and moving beyond its surface implementation, and difficulties with its sustained and widespread use given misalignments with existing quality and safety processes.

Conclusion The MMSF requires a dramatic departure from traditional safety strategies that focus on discrete problems and emphasise measurement. MMSF implementation requires extensive discussion, coaching and experimentation. Future implementation should consider engaging local leaders and coaches and an organisation or system approach to enable broader reach and systemic change.

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ An initial study of the Measurement and Monitoring of Safety Framework (MMSF) provided insight into implementation challenges, demonstrating the need for additional research on processes that optimise the use of MMSF in practice.

WHAT THIS STUDY ADDS

⇒ This study shows how the MMSF, through implementation processes, changed ways of thinking, interacting and practising.
⇒ This involved supporting healthcare providers and leaders to think about safety in broader terms than past harm and bringing these new lenses to discussions and interactions that occurred across a range of healthcare processes, routines and contexts.
⇒ These discussions and interactions led to practice changes that were perceived to improve care.

INTRODUCTION

Patient safety continues to be a critical element of healthcare; however, many observers have questioned whether current strategies can achieve significant, widespread and sustained improvements in safety.[1–4] Patient safety tools, such as checklists and best practice bundles, often focus on specific clinical processes and are implemented as separate projects in isolation from one another, limiting development of a systemic approach to safety.[5] Top-down safety programmes often inadequately engage healthcare providers in improvement.[6] Furthermore,

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ This study provides direction for future MMSF implementation and ways of using the Framework in practice; the challenges identified call for further strategising of implementation strategies.

⇒ Research that prioritises the interplay between the MMSF, implementation and contexts will continue to illuminate the processes and impacts of the MMSF conceptual approach to safety.

safety programmes are frequently planned with insufficient consideration of the social and cultural contexts in which they will be introduced.[7 8] In addition, while measurement is important in assessing impact, the complexities in achieving meaningful measurements and the important processes and impacts that existing measurements fail to capture constrain progress.[9–12] Given such learnings over the past 20 years, new strategies that address these gaps and reframe safety efforts deserve attention.

In this context, the Measurement and Monitoring of Safety Framework (MMSF) was developed to expand the narrow range of approaches available to healthcare organisations to analyse, monitor and learn from safety and quality information.[13] The MMSF offers a broader framework for safety, in contrast to individual interventions (eg, bundles, checklists). As described in prior publications,[14 15] the MMSF consists of five dimensions critical to safe care focusing on past harm, reliability, sensitivity to operations, anticipation and preparedness, and integration and learning. As shown in figure 1, each dimension reflects one of five fundamental questions relevant to organisational safety. The Framework aims to shift from a simple

Figure 1 Framework for the Measurement and Monitoring of Safety.

reliance on compliance to regulations and standards to a more proactive approach enabling staff to identify and review the information they need and develop a more nuanced and comprehensive understanding of safety that focuses on learning rather than punishment.[14 15] The report of the Framework, its creators explained, offered the 'technical' phase of their work, and the 'adaptive' phases would need to follow, as the findings are translated to different contexts and audiences.[15] This 'adaptive' work, with attention to the co-constructive nature of the MMSF intervention and the workplace context,[8 16] and positioning within a learning collaborative programme, is the focus of this study.

Following an initial consultation with healthcare leaders on the Framework,[17] the MMSF was implemented in nine healthcare organisations in England and Scotland.[18] Study findings from this project identified that teams rarely embraced all five dimensions of the Framework. Rather, teams tended to focus on a few dimensions, used single safety interventions such as safety huddles or used the Framework programme to support existing initiatives. Some teams misunderstood the role of the Framework as a conceptual model, viewing it instead as a checklist or tool. However, one participating Trust succeeded in addressing all dimensions of the Framework at regional and frontline levels, demonstrating the possibility for a wider and deeper application of the Framework. Given these limited findings, there is a risk of rejecting the Framework without further attention to how it is implemented. Key learnings were the importance of leaders who understand the concepts and can drive change and engage teams; protected time for teams to reflect together on new thinking around safety to build consensus and local ownership; and participants needing to understand how to test this conceptual approach.

The 'adaptive' work of translating the MMSF into different contexts and audiences[15] continued in Canada with a demonstration learning collaborative project involving seven healthcare organisations. This was followed by a learning collaborative (the 'Collaborative') with 11 teams from across the country. Learning from prior efforts, this Collaborative drew on different logics for disseminating innovation. It offers a model of spread and scale-up as structured improvement, addressing barriers and facilitators experienced in the first implementation efforts. This model was also attentive to complexity science, enabling each team to engage with the Framework in their contexts.[19] The Collaborative therefore focused on processes of education, coaching, key messaging and dedicated time, which, in turn, created space for discussions, uncertainty, unpredictability and emergence.

In this paper, we report on a study of the Canadian Collaborative to increase our understanding of the adaptive work needed to implement this

conceptual framework through a learning collaborative programme.

METHODS

We conducted an interpretivist qualitative study[20] from November 2019 through March 2020 using interview, observation and documentary data collection methods.

Study context

The Canadian Patient Safety Institute (CPSI) led the planning and implementation of an 18-month national learning collaborative to implement the MMSF (2018–2020) and invited interested healthcare teams to apply. The aim was for each team to develop a more comprehensive approach to safety. CPSI engaged patient safety experts from Canada and the UK to inform and guide the Collaborative. Each team identified their members, with representation from front-line staff, education, quality improvement, management, and organisational and regional leadership. The Collaborative consisted of 11 teams from seven provinces, with teams drawn from emergency, surgery, medicine, cardiology, psychiatry, supportive living and long-term care settings, as well as in-person and remote care programmes.

The Collaborative consisted of three in-person learning sessions and a closing congress (online supplemental appendix 1). Between sessions, teams worked to advance the sharing and implementation of the MMSF over 6-month periods. Teams participated in virtual meetings where participants shared successes and challenges, and speakers presented on topics such as implementation science, storytelling, measurement, and spread and scale-up. Two coaches assigned to each team conducted regular coaching calls and two to three in-person visits during the Collaborative.

Data collection and analysis

All MMSF Collaborative participants (n=51) were invited to participate in a semistructured interview[21] to gain insight into their perceptions and experiences of the Collaborative and the MMSF (online supplemental appendix 2, interview guide). We conducted 34 interviews with 36 participants, with representation from all teams. Interviews were conducted January through March 2020 by telephone (n=29) or in person (n=5), and ranged from 24 to 64 min (average 45 min). After informed consent was obtained, interviews were audio-recorded and transcribed verbatim.

We conducted observations of select team sites to gain insights into the settings of MMSF implementation, and of in-person and virtual learning sessions to collect data on the knowledge shared and generated. Six sites were chosen for site visits to obtain a range in geographical location, healthcare setting and MMSF practices; five site visits were completed given timeline constraints. The 1-day site visits involved observations of the units and organisation where the Framework was being implemented, specific activities where the Framework was being used such as huddles and meetings, and related activities such as quality and safety meetings. The researcher also had informal conversations with team members and other people at the site about the MMSF. Observations of learning session three, closing congress and all-team calls from November 2019 through to the end were also conducted. At all observations, participants were provided information about the researcher(s) and the goals of the study. The researchers recorded notes during the observations and transcribed them following the session, adding descriptive details and analytical interpretations.

We also collected relevant documents at the site visits and learning sessions, including learning session materials (eg, learning resources), team materials (eg, toolkits, pictures of huddle boards) and power points of team presentations.

We used interpretive thematic analysis[22] that consisted of generating initial codes, searching for themes, reviewing themes, and defining and naming themes. JG and LR inductively coded the interview data manually (using Microsoft Word), first coding, reviewing and discussing an initial code list based on three transcripts, revising it based on discussions and then sharing the coding of the remaining transcripts. We then used this coding guide to analyse the observation and document data. Analysis and interpretation of all data was guided by the constant comparison method[23] as we moved back and forth within and between the data collected across the sites, and used researcher team meetings to discuss identified themes. During analysis, we were reflexive of our disciplinary and professional backgrounds and roles related to leading and studying the MMSF Collaborative. JG, LR and LJ had solely research roles in the MMSF, whereas VF and RB were leaders in the funding, planning, sharing and coaching of the Collaborative.

FINDINGS

The findings are organised into three sections. The first section reports on participants' experiences of learning and reframing thinking about safety. The next section describes participants' experimentation with the Framework. The final section focuses on MMSF spread. Table 1 provides a summary of key findings.

'Safety': learning, discussing and reframing

In the first learning session, participants were guided to explore concepts of safety beyond addressing past harm. This session aimed to create the space to think differently, as participants were asked to reflect on how they had been considering safety in their organisations. Participants described variable knowledge of, and comfort with, the MMSF dimensions following this session. However, there was receptiveness to a

Table 1 Summary of key findings

Theme	Description and examples
Reframing safety	Reframing safety occurred when Collaborative site leaders encouraged staff to discuss and think about the five dimensions (past harm, reliability, sensitivity to operations, anticipation and preparedness, integration and learning). These leaders developed strategies to share the MMSF (eg, one dimension at a time or whole Framework, modifying wording used, and who it was shared with) for local contexts. Coaching of the leaders was essential to support continued engagement, reflection and experimentation of safety dimensions. Examples: ► Site MMSF leaders talked about the Framework at leadership meetings within and across regional healthcare organisations to encourage people to think about the dimensions in relation to their workplace contexts, with no expected deliverables ► Site MMSF leaders added their own probing questions to the Framework to support the understanding and application of the dimensions by front-line healthcare workers
Framework experimentation	Sites experimented with the MMSF in different ways. Many began with the sensitivity to operations question 'Is care safety today?' with discussions that reflected their workplaces. Sites also frequently incorporated the Framework into existing safety activities (eg, rounds, huddles). As people became comfortable with the MMSF they began using it spontaneously and for targeted safety problems. Examples: ► Site MMSF leader brought safety report data back to staff to allow for informed discussions about concept of 'reliability' and staff came up with suggestions, for example, how to create safer surfaces to prevent falls ► A group used the MMSF to guide a post-mock code exercise discussion. Each dimension led to a different kind of reflection on the exercise (eg, 'Is care safe today?' led to discussions about the standard of care followed, having all the equipment needed, etc; The question 'will care be safe in the future?' led to discussions about the X-ray department and their roles during a code)
MMSF spread	Collaborative teams had both unplanned and planned spread and to a lesser degree scale-up. Examples: ► An MMSF team member changed jobs during the MMSF and then initiated MMSF implementation in her new unit ► MMSF was incorporated into the electronic medical record system that was piloted in one site and would then be disseminated across the organisation

MMSF, Measurement and Monitoring of Safety Framework.

new approach to safety which resonated with their lived experiences and other safety learning, and recognition that current strategies were insufficient.

> I think we're still stuck in the past harm … we're very reactive and a lot of decisions get made not based on five domains, but usually based on one or maybe two … thinking about all five domains is a radical way of thinking about safety … if you're open to knowing that … we haven't changed things, things are not safer, so therefore the way we're doing it is not working … (7, Senior leader)

Following the first learning session, participants were directed to continue to engage with the Framework and share it locally. The participants heard the messaging to not jump to a discreet project or implement a new intervention, but to engage in conversations about safety and the Framework and begin to imagine how the Framework could be integrated in their contexts. The absence of any expectation for teams to produce concrete deliverables or reporting during this time was perceived as unusual and reinforced the message that teams should focus on conversations with the range of stakeholders, particularly front-line workers, and create a psychologically safe space for people to talk about safety. Many described this as challenging:

> What I don't think I appreciated right away … was how I think often we try to do and do and do and we want results right away and we want something measurable … And I think that the hardest challenge I had after learning session one was not just coming up with a project per se and doing something and getting from point A to point B with this deliverable. But more the culture change aspect of it. (12, Senior leader)

Site leads described the critical role of coaching visits shortly after the first learning session, given that it was difficult to attend a 2-day learning session and then return to sites and share the Framework with others while they were still deciphering it themselves. The coaching was perceived to support the site leads' understanding of the Framework and sharing locally and more generally to reinforce their engagement with the Collaborative goals.

> … You're really learning to revamp your thinking and so in many ways you start to panic until there's that reassurance from them (coaches) that no, that's OK. That is exactly what it's about. It's to retrain your thinking. (15, Senior leader)

Site leads developed different strategies to share and explore the Framework locally, influenced by what was most feasible and effective based on the number, professional backgrounds and roles of learners and time available. The coaches supported these efforts, at times talking about the Framework themselves with others when on-site or virtually. Participants described 'sharing', 'talking about', 'presenting' and 'teaching' the MMSF. Such activities included sessions where site leads discussed each dimension or the entire Framework upfront; in some cases, initial conversations of the varied types of harm or adapting the wording of the dimensions to make them accessible supported sharing of the Framework. Other strategies involved incorporating the MMSF language into everyday

communication and routines, such as in emails or report handover sheets, or rounds as the following quote demonstrates:

> So it (MMSF poster) was in the main area of the (name) department … We would reference it throughout … to start bringing the terminology into play every day. (11, Clinical leader)

Many participants spoke to the resources and effort required to explain the MMSF, with some feeling overwhelmed at the number of people to reach. Participants varied with their comfort presenting and talking about the Framework. Some Collaborative teams experienced member turnover or limited investment in the Framework, which affected the scope of sharing. There were also instances of divergent opinions about how to increase others' understanding of the Framework, with some noting that a superficial understanding of the Framework would limit meaningful changes. Despite these challenges, many participants noted that committed leadership, ongoing discussions, along with practice using the Framework and coaching over time helped reframe their understanding of safety. Many sensed a 'shift in thinking' happened over time, where issues that were previously treated as 'an irritant', were now being framed as a safety problem:

> It took weeks before the conversation was fluid and they could articulate back to me what reliability was and what integration was and all the dimensions … what they thought we were doing on the floor that actually looked like we were involving those dimensions …. (32, Manager)

Framework experimentation

Following the second learning session, participants were guided to move from something abstract to concrete to incorporate the MMSF into existing practices. Leadership played a critical role given that site leads were responsible for identifying strategies and which practices to target based on their contexts.

The sensitivity to operations question 'is care safe today?' was perceived to be an accessible way to use the MMSF and was therefore used at numerous sites as an initial strategy. Participants described the ways in which the resulting conversations and behaviours were markedly different, yet contextually relevant, at each site. At a remote healthcare programme, this question resulted in discussions about how they know care is safe and how to measure the safety of care. This led to talk about the reliability of the equipment being used at the patients' homes to inform care decision-making, which resulted in discussions with suppliers to monitor the performance of the equipment. At other sites, the question led to asking patients/residents about their perceptions of safety, rather than relying on organisation surveys, contributing to new insights about differences in perceptions of 'safe care', and consequent interactions:

> I think we make assumptions that patients are nicely tucked into their beds … the wheels are up, that they're safe. But I don't know if we always ask the patients if they actually feel safe in our acute care setting. (29, Senior leader)

The incorporation of the MMSF into existing activities, such as rounds, huddles and continuous improvement boards, was another common implementation strategy. This involved using the language associated with the MMSF dimensions when asking a question or making a comment, labelling a safety ticket, reporting an incident or performing a huddle. Participants described how these practices were changing the nature of conversations and interactions. At an acute care setting, observations showed how the MMSF dimensions were used to structure the conversation of morning safety rounds, as noted by one of the site leads:

> Another thing we would talk about is sensitivity to operations. So here now, what are we sensitive to? We know that our waiting room is packed. We know they're really, really critically ill. Who are we most concerned about right now?… Anticipation and critical preparedness—so is care safe today but is it safe tomorrow as well and how do we know that? And then integration and learning. So how are we responding to what's currently happening and what are we trying to change? So we put that (MMSF) in our safety huddle and the responses that we got from it were actually fantastic. (11, Clinical leader)

In another example, a participant recounted the use of the MMSF in a discussion of falls:

> We had a fall of our patient. Do we know how many have fallen in a month? Do we have that data? We have that data but does the frontline know? OK and how have we learned and what have we improved? So now if you ask the nurse, immediately the nurse will say, 'Our improvement was that we brought the patients closer to the nursing station and my manager got more fall mattresses.' So now I'm seeing people are able to play with the dimensions with the incidents. (33, Quality improvement specialist)

At sites where people became comfortable with the MMSF through its use in activities such as rounds and incident reports, it started being used spontaneously and for targeted safety problems. For example, site leads described instances of front-line staff initiating a discussion about a safety incident using the MMSF on their own prior to safety rounds. A participant described changes in reports to the board, expanding the focus beyond past harm. In another instance, a site lead used the Framework with a physician group to address a problem of late reports, where reports such as laboratory or diagnostic imaging test results came back after physicians ordering them had finished their

shifts. The team was able to create a new process to ensure reliable follow-up of late reports using the MMSF as a guide. Participants noted the critical focus on engaging front-line healthcare providers:

> So, one of the key things was, you know it empowers … we know our frontline care providers have the answers. They know more about things than we do… This gave them, I guess permission to talk about things … It empowered them to own the solutions and the recommendations. (20, Senior leader)

Participants described ways in which moving beyond a task-based, measurement-prescribed safety focus brought validation for 'that soft intelligence piece' that 'they've been seeing and concerned about' (16, Manager), but had not been accessible in prior discussions focused on data. The Framework contributed to recognitions that different types of information could be collected to create a more holistic understanding of safety:

> It's taught me that measuring refers to metrics and data, audits and count; whereas monitoring refers to the questioning, observing, listening, paying attention to people's perceptions. One of the big aha moments for me is in the past you set targets and so you're watching those targets and questioning when they're not being met and it really can lull you into a false sense of security when you're meeting those targets. (15, Senior leader)

The use of the Framework was variable across the 11 teams, with some leaders more committed to engaging with the Framework more systematically than others. Some participants noted that the MMSF required a paradigm shift which was very challenging. There were also concerns that the Framework was being used in a 'surface level way' to target easier to address issues, and whether 'it's stuff that we'd be doing normally and just putting it into the Framework' (6, Education lead). A participant noted that practice was needed to apply the Framework to issues like delirium with less concrete solutions, and others commented on wanting to make changes but not having clarity about how to do so:

> I'd love to change board reporting … And that was really what I wanted to focus on, so how do we report on things other than past harm … But there's not a lot of examples that can be provided on how you do that. (17, Healthcare system leader)

Participants perceived that improvements in processes impacting on clinical and safety outcomes were happening, although measurements that were typically used to demonstrate impact were not a main focus of the Collaborative. Some noted that impacts would be challenging to measure due to factors such as widely distributed effects that were difficult to quantify and limitations in available data:

> And that's the big take away for me … there's measurable items in some of the work that we've done, but it's less about those measurable items to me and more about how the conversation's changed and it's changed some of the focus. I'm a tough sell on some stuff but I'm kind of sold. (12, Senior leader)

MMSF spread

At the third learning session, the focus shifted to MMSF spread. A few teams felt that it was too early to think beyond local implementation either because they were still having challenges in their initial target area or had limited bandwidth. A few teams had unplanned spread across their organisations, for example, due to a team member moving units and implementing the Framework in that new unit or other units observing MMSF practices and wanting to incorporate it into their units. Still other leaders had been strategic in sharing and integrating the Framework in the organisation and healthcare system throughout the Collaborative and appreciated the additional support for these efforts:

> … anybody that we saw we talked about we had gone on this great learning session and this is what we're learning. We talked to our patients and family advisory groups, we talked to front-line staff, we talked to different managers, executive directors and when we were on sites we talked to anybody who would listen to say this is what we learned, this is what we're going to expand on, what we want to move with, just to get that conversation going. (23, Quality improvement specialist)

Among the teams that strategically shared the MMSF broadly, there were concerns about the extent to which the Framework was becoming deeply embedded given the coaching and time required:

> We have little pockets happening all over the place. I don't feel like any of them are super evolved minus the board report I think is well evolved, but the rest of it is still a journey. (9, Quality improvement specialist)

A challenge of MMSF spread was that these efforts were occurring within the context of numerous, and at times competing, quality and safety frameworks. At one site, there was interest in revising a unit transfer form based on the MMSF; however, these efforts were challenged by lack of stakeholder support and organisation standards. During an observation of a hospital leadership meeting, MMSF team members were implicitly attentive to the MMSF, although this was not a Framework recognised by others around the table. Participants noted frustration for those now thinking through an MMSF lens given misalignments between their approaches to safety and those of their organisations:

> So I think that we've opened up their eyes, but a lot of things haven't changed and so I think that people

> are maybe feeling even more frustrated because of the Framework, because now they think of it from five different domains and lenses … we've opened up their eyes, but we haven't changed how we're prioritising the risks. It's disappointing for people. (7, Senior leader)

A more in-depth and diffuse use of the Framework was therefore recognised as a long-term process and contingent on a system-wide approach:

> I think all the way up, from the board to frontline. I think everybody needs to have the opportunity to learn this, but it's going to take a while, because that's a huge culture change. I also think the Ministry has to adopt it as well … if the Ministry expects something differently from us, how do we continue to do this when they're telling us to do something else? So I think it has to be a whole system initiative (4, Senior leader)

DISCUSSION

Our study contributes to the safety literature, and work on the MMSF specifically,[18] in showing how, through a learning collaborative programme, sharing the Framework and coaching supported participants' understanding of the concepts, enabled their embrace of the Framework and facilitated their 'testing' of the conceptual approach. Unlike the typical implementation of project-based safety initiatives, individuals who engaged with the MMSF worked on changing their ways of thinking, interacting and practising. These findings are encouraging in addressing limitations of commonly used safety strategies. Still, there was variability in how leaders facilitated the necessary discussions, managed the uncertain and emergent nature of the MMSF, and dealt with the roadblocks of competing organisational processes and policies. Given the central role of implementation processes in our study, it is clearly not possible to isolate these processes from the Framework or its impacts. These findings contribute to our evolving understanding of the adaptive work of the MMSF through a learning collaborative programme, and to scholarship about patient safety programmes and their implementation.

In our findings, participants described numerous ways in which each of the five dimensions—past harm, reliability, sensitivity to operations, anticipation and preparedness, and integration and learning—inspired different ways of thinking and acting about safety. Furthermore, these discussions took place in varied clinical contexts and impacted a range of behaviours, interactions and practices, demonstrating the relevance of this Framework across contexts. These findings likely reflect the Framework being grounded in safety literature and experiences of other industries.[15] It is interesting to note that other multifaceted frameworks have also been recently empirically developed, including a framework of features of safety in maternity units[8 24] and the 'Socio-Organisational Function and Facilitative Tasks'[25] framework required to deliver quality improvement. These frameworks focus on different aspects of quality and safety and/or clinical areas; however, they share an emphasis on processes such as enabling learning to occur, contextualising experience, creating opportunities for leaders and front-line staff to observe, listen, think and debate openly together, and fostering collective awareness and alertness.

The understanding that an intervention cannot be isolated from implementation contexts given their co-constructive nature as they interact in multiple, complex and dynamic ways[8 16 26] is reinforced in our study. Prior research clearly demonstrates the different ways in which healthcare providers engage with a single safety tool that consequently leads to different types of behaviours and impacts.[27 28] In this paper, we report on the varied ways that participants engaged with the Framework and how they used it, as shaped by their workplace settings. Future research should continue to attend to both the affordances of the MMSF as a tool and the implementation processes that shape how it is used in, and how it impacts, practice. For instance, as Cribb and colleagues[29] discussed, a narrow focus on tasks, efficiency and managerial pressures can limit the opportunities for conversations to occur; however, conversations can allow individuals to re-experience and rethink what they are doing and to share different perspectives, tensions and uncertainties. Explicit attention to what is taken for granted as valuable or successful in healthcare and what quality means to different people can shift mindsets and inform new ways of thinking. Alternatively, a sensemaking lens could draw attention to the processes through which individuals work to interpret their surroundings using the MMSF, particularly in the context of novel, unexpected or confusing events. The actions that people take to make sense of a situation in turn enacts the environment that they seek to understand.[30]

Our findings showed examples of spread and, to a very limited degree, scaling up, across an organisation.[31] Given accumulating evidence of MMSF Collaboratives, and the challenges described when MMSF informed ways of thinking and acting conflicted with other organisational processes, future implementation strategies should consider spread and scale strategies to target an organisational, regional or system level approach. While the evidence of spread and scale of innovation in health systems is still evolving,[31 32] this literature provides some guidance and reinforces our experience of MMSF implementation as a context-based journey. Our findings demonstrated the intensive education, coaching, leadership and experimentation required for MMSF implementation, similar to other studies aimed at changing healthcare providers' ways of thinking and acting in relation to safety.[33] Consequently, a modified learning collaborative model is

needed, with local leaders and experienced coaches, to enable broader reach. However, as noted by Chatburn *et al*,[18] there is a risk that local leaders and coaches will not have the expertise to convey and share the MMSF concepts with the depth required. Further examination of how to develop local MMSF expertise, ensuring access to senior coaches as they develop their expertise, is therefore needed. Internal learning collaborative approaches could be developed by organisations themselves, incorporating key elements reported in our programme studied as well as findings from the UK.[18] These would include, among others, experienced coaches familiar with the MMSF and its implementation, senior leadership support and funding, and ongoing review and feedback to help units adapt the Framework to their context, including sharing between and among units.

Our study has limitations. Our interview data collection focused on Collaborative participants and therefore did not have the opportunity for non-Collaborative participants at each site to share their experiences with the MMSF. Furthermore, our study examined participants' experiences in the later part of the Collaborative rather than a complete longitudinal study of teams' experiences. We recommend that future research include more in-depth examinations of teams' experiences of the MMSF longitudinally and in practice.

CONCLUSION

Our study demonstrates the opportunities for the MMSF, through a learning collaborative programme, to change the ways in which stakeholders in healthcare conceptualise safety and modify their practices, interactions and routines. However, the MMSF requires a dramatic disruption from traditional safety strategies that focus on past harm and discrete problems and emphasise measurement. MMSF implementation therefore requires extensive discussions, coaching and experimentation. The sustainability and spread of MMSF requires further research using theories and methodologies that amplify the processes and impacts of the MMSF, and optimal implementation is contingent on an organisation or system-wide approach.

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