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Organisational cultures and climates as key contextual factors in the implementation of a value-based healthcare toolkit within an ECHO® network: A multi-methods implementation evaluation

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Abstract

Background

Low value care is widespread, yet hospital and health service staff lack support to identify and address it. This study evaluated the pilot implementation of the Moving Towards High Value Care Toolkit delivered through a Project ECHO® network (a virtual community of practice model) to respond to this need.

Methods

A multi-methods implementation evaluation was conducted in a statewide paediatric service in Queensland, Australia, underpinned by the Consolidated Framework for Implementation Research. Data included attendance logs, staffing costs, and semi-structured interviews with session participants.

Results

Forty-five staff registered and 30 attended at least one session; 10 attendees participated in an interview. Implementation costs totalled $22 457, largely attributed to staffing. Participants valued the engaging sessions, opportunities to learn from experts, and diverse local case studies. Organisational culture and its influence on participants' psychological safety were identified as affecting session engagement and application of the toolkit.

Conclusions

Implementing the toolkit through the ECHO model™ showed promise, but hierarchical dynamics limited participant confidence to raise low value care, and the need for greater organisational support constrained the toolkit's application. Future implementation may benefit from demonstrated leadership endorsement, enhanced psychological safety, and ongoing support for participants to apply the toolkit in practice.

Contributions to Literature

- This paper reports on the novel combination of a practical toolkit within a telementoring model, showing how these approaches can be integrated to support implementation in real-world healthcare settings.
- Our findings highlight the importance of organisational culture and psychological safety in shaping how healthcare staff engage with and apply both the toolkit and associated implementation supports.
- Support was found for research evidence that toolkit-based interventions are most effective when paired with deliberate strategies that address the organisational contexts in which users work.

Background

Worldwide, it is estimated that 30% of healthcare provides little or no value and that 10% is harmful to patients (1). Identifying low value care is essential to ensure the allocation of limited resources for better, safer and more cost-effective care (2). Low value care can be defined as the use of a health service and/or intervention that offers little or no benefit to consumers, poses more risk than benefit to consumers, or where costs outweigh the added benefits (2). From a consumer perspective, low value care has been defined as duplicate care, care misaligned with consumer preferences or symptoms, or care that could have been avoided (3).

Development of a toolkit was conducted to support staff in hospitals and health services to optimise the value of patient care. The toolkit, 'Moving Towards High Value Care,' was developed in 2021 by researchers at the Australian Centre for Health Services Innovation (AusHSI) at the Queensland University of Technology (QUT), in partnership with Health Translation Queensland and health delivery organisations, and is available online at no cost (4). Toolkits, as a structured collection of educational resources, have been identified as moderately effective knowledge translation strategies (5). When embedded in multi-strategy interventions and developed rigorously, they can facilitate behaviour change and improve clinical outcomes in healthcare settings (5). Piloting potential approaches for implementation of the toolkit is important for yielding insights related to feasibility, acceptability, appropriateness and sustainability in practice settings. A virtual community of practice within a paediatric health service provided a useful context in which to do this in the present study.

A virtual community of practice consists of individuals with a common interest who learn how to improve their knowledge and practice through regular virtual interactions via videoconferencing technology (6, 7). In health service settings they have been used to facilitate social

learning and knowledge building (8). Reported essential characteristics include: the domain (what you do), the community (who you do it with), and the practice (what you do together) (6). Project ECHO® (Extension for Community Healthcare Outcomes; herein referred to as ECHO® or the ECHO model™) is an internationally validated and licensed telementoring methodology, grounded in the concepts of adult learning theory and case-based learning (9, 10). An ECHO® network is established around a specific topic and brings members together through live sessions that support collaborative learning and knowledge exchange. The ECHO model™ consists of a facilitator and a panel of subject matter experts who provide support and mentoring, a short didactic presentation followed by case presentation/s by network members. The session concludes with facilitated discussion, recommendations for the case presenter, and synthesis of key points by the panel (11).

Evaluating interventions from an implementation perspective enables researchers to understand not just whether they work, but how and why they succeed or fail across contexts (12, 13). An implementation evaluation, as presented in this paper, systematically examines how an intervention is carried out in practice including the implementation (what is implemented and how), context (how context affects implementation and outcomes), and the relationships between these (14). This study evaluated a novel approach to implementing the Moving Towards High Value Care Toolkit by embedding it in a new pilot ECHO® network dedicated to supporting health service staff to enhance the value of care provided to consumers and the community.

Research aims

This study aimed to: (1) identify contextual factors influencing implementation and strategies to implement the Moving Towards High Value Care Toolkit in practice, supported by a ECHO® network, in the context of a large hospital and health service; (2) explore the acceptability and appropriateness of the toolkit focusing on ECHO® network members' perspectives of its design and content; (3) evaluate the feasibility, acceptability, appropriateness, fidelity, cost, and sustainability of delivering the toolkit using the ECHO model™.

Methods

Description of the intervention and implementation

The Moving Towards High Value Care Toolkit (4) was developed to assist people involved in clinical decision-making and resource allocation, including team leaders and directors of services or clinical units, to identify and address low value care. The content of the toolkit was developed using evidence from a scoping review (15); features recommended in the design of toolkits (16); and information gathered from interviews with clinicians, managers, and health consumers (17). The toolkit includes multiple strategies (18–21) and the content is presented in six stages: identify, quantify, explore, plan, action, and maintain (Fig. 1). Each stage contains information to guide users through practical steps, drawing on relevant scholarly literature and tools.

[Figure 1 about here]

The Moving Towards High Value Care Toolkit was disseminated through a pilot ECHO® network (herein termed the Moving Toward High Value Care ECHO® network or pilot ECHO® network) hosted by the Children's Health Queensland Hospital and Health Service (CHQ) ECHO® hub. CHQ is a statewide paediatric hospital and health service in Queensland, Australia, that offers specialist hospital services with approximately 5,750 staff across multiple facilities. CHQ has used the ECHO model™ since 2016 and, at the time of writing, remains the largest ECHO® hub in the South Pacific region with more than 2,894 frontline professionals having participated from approximately 420 communities (22, 23).

To implement the toolkit, two of the original authors (ZT, SM) developed a content outline for six sessions in consultation with CHQ's ECHO® hub research team members (PM, EB). The sessions focused on capacity-building for staff regarding how to use the toolkit, including tailoring information to their specific practice contexts. The session topics are presented in Table 1. Each topic overview was available on iECHO (the technology platform the ECHO model™) for network members to view once they registered, and all network members received a digital copy of the toolkit prior to commencement of the first session. Each session was one hour in length, with an additional 30 minutes of pre-session setup and 30 minutes of debriefing. Topic presenters had experience as clinicians, leaders, managers and/or health services researchers, and were QUT staff. Panel subject matter experts were identified based on expertise and existing connections with research staff; and were provided with information by email and at a pre-session briefing prior to the session they were involved in. There were no out-of-pocket costs for joining or participating in the pilot ECHO® network. CHQ staff with ECHO® expertise led the organisational promotion and sponsorship, in-session coordination, session scheduling, enrolling and liaising with network members, and distributing post-session summaries and resources.

Table 1
Structure of the pilot Moving Towards High Value Care ECHO® network

Session topic	Session content	Number of panellists	Resources shared
1. Unpacking the problem and value in healthcare	• Toolkit overview • Defining and identifying low value care • What is context and why is it important? • Questions to ask yourself and others in identifying low value care	5	(15, 48–54)
2. Addressing low value care including de-implementation	• Exploring de-implementation as a concept and strategy • Identifying the four Rs of de-implementation • How can we engage patients and staff in de-implementation? • Understanding low value care, uncertainty and cognitive bias • *Case study*: De-implementation example	4	(44, 55–59)
3. Using measurement and monitoring evidence for value in paediatric healthcare (including PREMs and PROMs)	• Measuring the size and scale of value in healthcare – what data is needed? • Using PROMs and PREMs to learn about value in healthcare • How might measurement work to improve the value of paediatric healthcare? • *Case study*: High failure to attend rate in general outpatients service	4	(60–64)
4. Designing and implementing value-based healthcare strategies in health services	• Considering enablers and barriers • Selecting strategies to support change and developing an implementation/de-implementation plan • From planning to action – what is needed? • Considering stakeholder engagement • *Case study*: Prospective implementation example	3	(28, 44, 65–69)
5. Leveraging technology and digital health to design services and change behaviour	• What is digital health and why is it important? • What do we know about digital technologies for health behaviour change and patient-centred care? • How can digital health promote higher value care? • *Case study*: Implementation evaluation	4	(70–72)
6. Building a culture of value-based healthcare	• Enhancing stakeholder engagement • Embedding patient-centred approaches in setting priorities • The role of leadership and resources in change • What are the challenges to changing hospital and healthcare cultures? • How does being change ready and change fatigue connect to culture?	4	(38, 73, 74)

The research team considered there to be four components to the intervention: (1) the ECHO model™, (2) didactic presentations of each of the toolkit's subsection components, (3) interactive case study presentations, and (4) the overarching toolkit resource.

[Table 1 about here]

Context

The study team were unaware of other high value care initiatives being implemented within the study site at the time of this intervention. CHQ members of the research team highlighted that a core organisational objective in CHQ's strategic plan was to "accelerate sustainable, high-value care through integration, innovation, and transformation" (24). Prior to the launch of the Moving Towards High Value Care ECHO® network, leaders from CHQ's Division of Strategy and Transformation met with the study team to discuss ways of identifying and piloting initiatives that focused on realising higher value care in the services provided. This strategic positioning of CHQ was leveraged to promote the pilot as a professional development opportunity for targeted staff across the organisation and to garner buy-in from senior decision-makers to nominate and support their staff to participate. The targeting of mid-level leaders (e.g., with formal supervisory or leadership responsibilities) for membership of the pilot ECHO® network aligned with the toolkit development (17), reflecting their decision-making authority to bring about change, but base-level staff (e.g., clinicians without formal supervisory or leadership responsibilities) were not excluded from joining the network.

Study design

A multi-methods implementation evaluation of the Moving Towards High Value Care ECHO® network was conducted. This consisted of qualitative analysis of semi-structured interviews conducted with participants; and descriptive analysis of ECHO® data reports and costings for implementation. Feasibility, fidelity and cost of implementation were analysed using mixed methods whereas other outcomes, contextual factors and implementation strategies were analysed qualitatively.

This study was performed in accordance with the Declaration of Helsinki and approved by the Children's Health Queensland Hospital and Health Service Human Research Ethics Committee (HREC/24/QCHQ/104909). Written consent was obtained from participants prior to participating in an interview.

Conceptual underpinnings

The Consolidated Framework for Implementation Research (CFIR 2.0) was used to systematically identify and assess contextual factors that may have influenced implementation of the Moving Towards High Value Care ECHO® network (25) using the five domains: intervention characteristics, inner setting (e.g., the organisation), outer setting (e.g., external policies, patient needs), characteristics of individuals involved in the implementation process, and implementation process. The implementation outcomes of feasibility, acceptability, appropriateness, fidelity and sustainability, proposed by Proctor et al (26, 27), were used to evaluate implementation. The Expert Recommendations for Implementing Change (ERIC) were used to determine strategies that may address contextual factors in future iterations of the pilot ECHO® network (28).

Study processes

In April 2024, a flyer was distributed through the CHQ all-staff e-newsletter about the Moving Towards High Value Care ECHO® network, asking interested staff to complete a survey about availability for session scheduling. Session times were determined based on majority availability and study staff capacity. The first session was held in June 2024.

Participants and sampling strategy

Members of the Moving Towards High Value Care ECHO® network who attended at least one session were recruited for the study. Participants included were aged 18 years or older and employed by CHQ. Potential participants were asked to consider being interviewed for the study via email from the ECHO® network coordinator and verbally by the facilitator at each session. ECHO® network members were informed that being involved in the research project was voluntary and joining the network did not presume consent or participation in the research. Purposive sampling of interview participants from the network was planned to achieve diversity in included professional disciplines and practice environments. Participants were encouraged to share the opportunity with colleagues.

Data collection

Semi-structured interviews were conducted by QUT researchers between September and November 2024. An interview guide was developed to explore participants' views on the implementation outcomes for the Moving Towards High Value Care ECHO® network, alongside broader reflections on implementation strategies and value in healthcare (see Additional File 1). Interviews were audio-recorded and professionally transcribed verbatim.

Quantitative data consisted of monthly pilot ECHO® network session attendance logs, de-identified member data from CHQ's iECHO® system, the ECHO® Session Scorecard results (a standard ECHO® measure completed by the ECHO® network coordinator that assesses online presence, communication, facilitation, and presentation), and staffing costs to deliver and coordinate the pilot ECHO® network. Presenters of the didactic presentations provided estimates of additional preparation time. Participant demographic data collected included gender, profession, and leadership level.

Data analysis

Three researchers (EH, KY, ZT) identified the contextual factors influencing optimal implementation of the toolkit education series inductively and mapped them to CFIR 2.0 (25) using content analysis. Content analysis was also used to analyse data related to factors that fell outside of CFIR 2.0 and the implementation outcomes of feasibility, acceptability, appropriateness, fidelity, and sustainability (26). Content analysis involves isolating segments of data that represent salient concepts and then applying a framework to organise these segments in a way that can be used meaningfully to describe a phenomenon (29). Strategies for addressing contextual factors were identified inductively using content analysis and mapped against the nine domains of ERIC (30) by one researcher (KY), to determine alignment with theory-informed implementation strategies more broadly. All coding was conducted in Microsoft Excel. Illustrative participant quotes have been edited to remove fillers (e.g. 'um', 'ah') for readability. Broad professional categories (e.g., allied health professional) have been used for quote descriptors to reduce the risk of identifying participants.

Quantitative data were analysed using descriptive analysis to describe the members and attendance patterns of the pilot ECHO® network, and the demographics of interview participants. Staff time (hours) and associated costs related to implementation of the pilot ECHO® network were estimated. All costs are reported in 2024 Australian dollars from the perspective of the relevant organisation (CHQ or QUT, as appropriate).

Findings

During the study, 45 staff registered for the Moving Towards High Value Care ECHO® network. Attendance for each of the six sessions is presented in Table 2. The most common professional group represented within the network, both by registration and session attendance, were allied health professionals. Five network members presented a case study in four of the six sessions.

Table 2
Members of the pilot *Moving Towards High Value Care ECHO®* network attendance by position

Position Title	Number of registered members in ECHO network	Number of active members in ECHO sessions	Session 1: Unpacking the problem and value in healthcare (06 June 2024)	Session 2: Addressing low value care including de-implementation (11 July 2024)	Session 3: Using measurement and monitoring for value in paediatric healthcare (01 August 2024)	Session 4: Designing and implementing value-based healthcare strategies in health services (05 September 2024)	Session 5: Leveraging technology and Digital Health to design services and change behaviour (03 October 2024)	Session 6: Building a culture of value-based healthcare (07 November 2024)
Administrative Personnel	6	3	1	2	3	2	1	0
Allied Health Personnel	26	21	9	9	13	3	3	4
Medical Personnel	1	No attendance						
Nurses	5	3	2	1	0	1	1	1
Other health or support workers (e.g., HR)	2	No attendance						
Project Managers	4	3	1	1	0	0	0	2
Research Personnel	1	No attendance						
TOTAL	**45**	**30**	**13**	**13**	**16**	**6**	**5**	**7**

[Table 2 about here]

Demographic characteristics of the ten participants who completed an interview are outlined in Table 3. Eight of these participants were women and seven were mid- to high-level leaders. One additional network member expressed interest in an interview but could not be re-contacted by the research team.

Table 3
Demographic characteristics of interview participants (N = 10)

Characteristic	Number (%)
Profession	
Occupational therapist	4 (40)
Speech pathologist	2 (20)
Other (e.g., project manager)	4 (40)
Leadership level	
Base	3 (30)
Mid- or high-level	7 (70)
Involvement in case study presentations	
Yes	2 (20)
No	8 (80)
Session attendance at time of interview (range)	1–6

[Table 3 about here.]

Facilitation of sessions

At the commencement of the Moving Towards High Value Care ECHO® network, facilitators acknowledged that identifying low value care is inherently complex, given the variability in perspectives regarding what constitutes “value.” This was revisited throughout the sessions and case studies, underscoring the challenge of addressing low value care within a context shaped by hierarchical structures and professional dynamics.

Delivering the toolkit using the ECHO model™ was at times challenging for QUT study staff, particularly in terms of finding ‘subject matter experts’ to fulfil panel roles and eliciting case presentations from network members. Existing professional contacts within CHQ largely supported this, especially given limited volunteering by network members to present a case study. Discussions with the CHQ ECHO® team early in the series also indicated to the QUT study team that greater facilitation was required to support the preparation and presentation of case studies. Given the organisational size and structure of CHQ (31), and the small membership of the pilot ECHO® network (n = 45), existing hierarchical and professional dynamics were likely amplified. Study staff recognised potential concerns around psychological safety (the belief that one can speak up or take risks without fear of negative consequences) for network members related to these presentations, particularly associated with power dynamics in decision-making. Researchers provided facilitation to case study presenters to support delivery of their presentations in a way that felt safe to the presenters (32). This included having sufficient de-identification, encouraging retrospective case studies, peer review by a colleague from the case presenters’ team, and obtaining permission from the relevant departmental director. This facilitation became an additional implementation strategy.

Contextual factors

Barriers and facilitators influencing implementation of the Moving Towards High Value Care ECHO® network mapped to CFIR 2.0 are presented in Table 4. Data were coded to 20 CFIR 2.0 constructs spanning all five domains, with findings concentrated within Innovation and Inner Setting constructs. Participants identified organisational culture and climate as a key factor influencing both their engagement with the pilot ECHO® network and the perceived application of the toolkit in practice. These influences operated across departments, professions, teams, and leadership; and influenced participants’ sense of psychological safety to engage with the pilot ECHO® network and toolkit in their organisational context. The term ‘psychological safety’ was specifically used by some participants and broadly described by others:

Table 4
Barriers and facilitators to implementing the Moving Towards High Value Care ECHO® network mapped to CFIR 2.0

Domain	Constructs	Facilitators	Barriers	Mixed facilitators and barriers
Innovation	A. Innovation source	• Group that developed the toolkit perceived as respected and reputable • ECHO® platform and model™ perceived as user friendly, trustworthy and safe • iECHO registration process is easy to use	• iECHO CRM registration process needs calendar entry option for each session	• ECHO® session format perceived as rigid by some, with some wanting more space for flexibility
	C. Innovation relative advantage	• ECHO® network series gives access to expertise not typically available		
	F. Innovation complexity		• Some topics (e.g., health economics) too complex for participants who mostly had little prior knowledge of this field • Difficult to apply toolkit learnings into practice without further support	
	G. Innovation design	• Information presented clearly in sessions • Toolkit give practical support to identify low value care and clearly outline steps to address • Session topics and case studies relevant • ECHO model™ was a good fit for delivery as the structure supports unpacking complex topics • Structure of session with theoretical framework prior to case presentation was perceived as useful • Case studies from diverse disciplines and areas of the hospital was valued	• Not enough support or training included for having the conversations needed to make change • Language used can exclude clinicians who want to use the toolkit • Reliance on 'experts' reduces the alignment with a community of practice ethos	• Participants noted that this service improvement focused ECHO® network differed from the more familiar clinically focused ECHO® networks. • Conflicting preferences for case study focus: presentations that asked for network members' advice vs retrospective case studies for reflections • Having researchers in the room who do not work at the site changes the nature of the conversation
Outer setting				
	E. Policies & laws	• The strategic priorities of the study hospital included a focus on high value care • The toolkit is consistent with the OCAHO Value-Based Healthcare framework that was published about the same time	• The widespread dissemination of the OCAHO Value-Based Healthcare framework may have contributed to lower awareness of the toolkit	
Inner setting	B. Relational connections	• High-quality relationships with colleagues to support case study presenters' study selection and delivery • High-quality relationships among colleagues that enabled sharing the toolkit with those who may benefit		

Domain	Constructs	Facilitators	Barriers	Mixed facilitators and barriers
	D. Culture		• Culture of your team/organisation may be at odds with the application of the toolkit	
	4. Learning-centeredness	• Completing the sessions with a colleague enabled conversations to apply toolkit	• Need extensive support to select and prepare case studies to ensure psychological safety in doing so • Lack of safe space to call out low value care in operational settings and thus apply the toolkit in practice • Guilt associated with attending education opportunities while colleagues covered clinical work	• Permission seeking of leadership to attend – not all leaders will support
	F. Compatibility		• Timing of delivery of the ECHO® network pilot sessions did not fit with clinical workflows (i.e., delivered on busiest clinical day for the hospital)	
	I. Mission alignment	• High value care is a key component of the organisation's strategic priorities		
	J. Available resources: Funding		• Lack of funding in CHQ to support activities required to thoroughly identify low value care	
Individuals	A. High-level leaders	• Involvement of high-level leaders in network demonstrates to members that the focus of the ECHO network is valued by the organisation		
	B. Mid-level leaders	• Network provides good support for middle managers who are clinicians without additional training in health service evaluation and implementation		
	C. Opinion leaders	• Colleagues encouraging others to attend and present a case study		
	D. Implementation facilitators	• Facilitators were clearly spoken and engaging		
	E. Implementation leads	• Valuable that leads had a mix of clinical and research experience		
Implementation process	B. Assessing needs: Innovation recipients	• Extra facilitation for case study presenters to support psychological safety	• Some topics were too complex for some participants	• Organisational and leadership support to attend the pilot ECHO network
	D. Planning	• ECHO® network coordinator shared rules of engagement for the series at the beginning		
	E. Tailoring strategies	• Having a current related project attracted innovation recipients	• Only delivering the innovation at one site may impede safe discussion of a range of topics	
	F. Engaging: Innovation recipients		• Little communication/marketing about the course observed by some participants	

Domain	Constructs	Facilitators	Barriers	Mixed facilitators and barriers
			• Unclear who target audience for session was – clinicians or leadership? • Lack of psychological safety for case study presenters	

I think it [the sessions] *just needed a lot more boosting in terms of the conversations that you have to have to do it…if we all worked in an ideal workplace where everyone felt safe to say anything at all times, great, toolkit's fantastic, off you go and you'll have no issues. We don't though… we really need the support and embedding of how to actually have a conversation to do this stuff.* – Allied health professional, ID 03

…that balance of power…around empowering others to be able to ask the stupid question or…not worry too much about how they're perceived by their peers…And I think middle managers too…the managers are probably…worse at that because they feel like they should absolutely know or they haven't kept up with the times. – Allied health professional, ID 10

[Table 4 about here]

Two contextual factors did not map to CFIR 2.0: (1) participants' familiarity and/or previous experience with the ECHO® network or virtual community of practice format; and, (2) participants' prior understanding and/or interest in each session topic which were described as facilitating uptake of the ECHO® network. One participant described 'readiness' to engage with sessions as being influenced by their prior knowledge, with unfamiliar content reducing their session engagement:

So, I think probably in the first few sessions that's probably more in my areas of prior knowledge and prior experience, so I probably understand that a bit more…but maybe towards the other sessions there will be times for me…maybe the topics are more foreign so my readiness in that topic will be much less. – Allied health professional, ID 06

Implementation outcomes

Feasibility

Perceptions regarding feasibility were mixed, with 67% of those who registered for the network attending at least one session (see Table 2; all registered members have access to session resources). Of those who attended, just over half joined two or more sessions, and a third attended three or more. Attendance declined in the second half of the pilot: the first three sessions averaged 14 attendees each, whereas the final three sessions averaged six attendees. Attendance at sessions was reported as primarily constrained by time pressures and limited flexibility in participants' clinical schedules. While participants generally valued the pilot ECHO® network's content and resources, many perceived its use as beyond their individual capability and noted insufficient support across organisational levels. The primary challenge was viewed as translating learning into practice within complex organisational cultures shaped by divergent approaches and priorities across disciplines and leadership tiers.

If we're thinking about things that need to happen to create a safe space to even identify and raise low value care, it…requires that psychological safety of having a conversation with your team and including your leaders and your managers in that to call out decisions that they have probably made… it's very hard to feel okay to…stand up for yourself…and say to a manager, who probably has been married to this service delivery model for a very long time, this isn't working. – Allied health professional, ID 03

Nevertheless, some did report that they were in the process of using the toolkit clinically or in research, had shared it with a colleague to use, or referred to it in conference presentations.

[Table 5 about here]

Table 5
Implementation outcomes for implementing a toolkit to address low value care in hospitals aligned with Proctor et al. (26, 27)

Outcome	Operationalised definition	Data source/s	Findings
Feasibility: The extent to which a new innovation can be successfully used or carried out within a given agency or setting (26). Other terms used in the literature: actual fit, suitability for everyday use, practicability (27).	The extent to which the pilot ECHO® network can be used by partners/stakeholders.	*Quantitative* • ECHO® network electronically collected administrative data including staff costings and resources, aggregated number, location and roles of attendees at each session; using descriptive analysis. *Qualitative* • Interviews analysed using content analysis.	*Quantitative* • 45 network members; 67% attended one or more sessions. • Attended most by allied health personnel, particularly speech-language therapists and occupational therapists. • Total cost of implementation was $22,457; delivery of the education sessions accounted for $6,171 of this with the remainder largely attributed to staffing costs. *Qualitative* • Some participants had used the toolkit in their work or had shared with a colleague to do so. • Health economics as a topic in the series was perceived by some participants as too complex to be taught and discussed. • Extent to which toolkit could be applied in practice was perceived as being limited by the organisation's cultures and climates to facilitate the necessary conversations.
Acceptability: The perception among stakeholders that a given innovation is agreeable or satisfactory. Satisfaction with various aspects of the innovation (e.g. content, complexity, comfort, delivery, credibility). Terms closely aligned include client response, responsiveness and engagement (27).	The extent to which the pilot ECHO® network is perceived to be satisfactory or engaging.	*Qualitative* • Interviews analysed using content analysis.	*Qualitative* • Toolkit consistently described as practical and easy to read, and presentation of the series consistently described as clear and engaging. • Including diverse case studies specific to the study hospital was supported; however, some noted the need for case studies to be better aligned with the session topic. • ECHO® network was perceived as providing valuable access to expert knowledge and diverse clinical perspectives • Engagement in the series declined over the series with an average of 14 attendees for the first three sessions compared to six for the final three sessions.
Appropriateness: The perceived fit, relevance or compatibility of the innovation for the setting, provider or consumer (26).	The extent to which the pilot ECHO® network aligns with the mission of CHQ, and fits within relevant contexts, and is perceived as appropriate by participants.	*Qualitative* • Interviews analysed using content analysis.	*Qualitative* • The pilot ECHO® network was generally described as being appropriate for the ECHO model™, though some participants felt the educational format didn't fully align with the ECHO model™'s virtual community of practice ethos. • Participants noted strong alignment with CHQ's strategic priorities and current healthcare trends to reduce low value care.

Outcome	Operationalised definition	Data source/s	Findings
			• Contention around appropriateness of targeting mid-level leaders—some felt this appropriate as they understand relevant overarching systems, while others thought inappropriate to exclude base-level clinicians who were perceived as often being the first to identify low value care.
Fidelity: The degree to which an intervention was implemented as it was prescribed in the original protocol or as it was intended by the program developers (26).	The extent to which the pilot ECHO® network was delivered as intended by the core team, including what core components were delivered and adapted.	*Quantitative* • ECHO® network coordinator completed the ECHO® Session Scorecard results. *Qualitative* • Interviews analysed using content analysis.	*Quantitative* • Four out of six pilot ECHO® network sessions met criteria for ECHO® fidelity. Two out of six sessions did not receive a case for discussion; the subject matter expert panel responded to the learning needs of participants and facilitated questions and discussion instead. *Qualitative* • Additional facilitation by the study team was required to support the preparation of case studies for psychological safety.
Sustainability: The extent to which the intervention is maintained or institutionalised (26).	The extent to which the pilot ECHO® network is planned to be continued as part of CHQ's suite of ECHO® networks and how this might be achieved.	*Qualitative* • Interviews analysed using content analysis.	*Qualitative* • Requests from CHQ to run another iteration of the ECHO® network, but the study team wanted to take time to evaluate this first series. • One participant stated that for the series to be sustainable, a network 'on the ground' would be needed to identify potential case study presenters.

Acceptability

Acceptability of the Moving Towards High Value Care ECHO® network was generally high, with participants consistently describing the toolkit and the didactic curriculum content presented as practical and easy to understand, and the sessions as clear and engaging. The inclusion of diverse, locally relevant case studies was well received, though some participants noted the need for stronger alignment between case content and session topics. The ECHO® network was valued for providing access to expert knowledge and broad clinical perspectives.

Appropriateness

The implementation of the pilot ECHO® network was generally perceived as appropriate within the context of the ECHO model™ as it gave "*people the opportunity to share information, but then to ask lots of questions and to share different points of view"* (allied health professional, ID 08*).* However, a few participants expressed views that the pilot did not fully embody the ECHO model™'s community-of-practice ethos (22). One participant (project manager, ID 01) observed that inviting panel subject matter experts may inadvertently "*discourage participants from sharing because they feel they need to listen to the experts*", and to address this, careful facilitation is required to "*nurture a community of practice so that the members do really feel like they have space and that their contributions are really valued.*" Another participant (program manager, ID 07), reflecting across several CHQ ECHO® networks, suggested that the ECHO® structure needs more "*flexibility in the model to meet the needs of the different goals of the ECHO® series*", while also recognising, in line with several other participants, that building a collaborative community of practice takes time. They highlighted the challenge "*for early series adopters to have that true psychological safety, to be able to speak up…to get conversation flowing*" (program manager, ID 07).

Additionally, there was mixed feedback regarding the appropriateness of targeting mid-level leaders; while some viewed this as beneficial due to their oversight of staff and areas within the system, others argued that discouraging frontline base level clinicians may undermine the initiative's effectiveness:

I thought it was pitched really well at that middle management level. … understanding the competing systems that happen within a hospital is known by middle-level managers that may not always be known, and doesn't have to be known, by all staff at all times. – Allied health professional, ID 05

I think targeting at middle manager and above to make sure that there is a consistency of skill level across…is where I would've also started, but I definitely would not restrict it from a clinician level because the clinician sees what needs to change on the ground. And if you're not all talking the same language or knowing what the same priorities are…then I think lots of really great opportunities get missed. – Allied health professional, ID 09

Fidelity

Results from the ECHO® Session Scorecard supported four of the six sessions as meeting criteria for ECHO® fidelity. A case study for discussion was not received by attendees for two sessions.

Sustainability

The Moving Towards High Value Care ECHO® network was not immediately sustained. This pilot was funded through a non-recurrent grant that was secured by the study team. The study team received requests from CHQ to deliver another iteration of the ECHO® network but chose to first complete evaluation of the pilot. Sustainability was generally not discussed by participants, though one stated that for the ECHO® network to be sustainable "*a network on the ground*" would be needed to identify and select appropriate case study presenters.

Cost of implementation

The total cost of implementing the pilot ECHO® network was $22, 457 over six sessions, translating to a mean cost of $499 per participant. Project meetings between QUT and CHQ staff accounted for $945 (4.5 hours), and delivery of the sessions was $6,171 (12 hours for direct session time including pre- and de-briefing, plus 17 hours of preparation in adapting the toolkit content for the didactic presentations and tailoring to the audience). The case study meetings contributed $203 (2 hours). The largest cost component was staff coordination: the ECHO® network coordinator contributed 137 hours at $11,160, and the ECHO® program manager contributed 38 hours at $3,978. Queensland Health enterprise Information and Computer Technology equipment fees added a further $300.

Implementation strategies

Coding of the interviews yielded eight tailored implementation strategies which were identified by participants in response to contextual factors. Seven strategies were mapped to ERIC, while one was not a good fit (Table 6). Participants identified the need for ongoing support or mentoring for them to be able to apply the toolkit in their work, as they are looking for "*where can I ask this question that's on my mind now… without it having to be an entire case study"* (program manager, ID 06). One participant stated a need for the ECHO® network to be delivered alongside an existing professional development program, 'High Value Conversations' (33), given the interpersonal and professional challenges associated with identifying low value care with colleagues in healthcare contexts:

Table 6
Implementation strategies to address key contextual factors

Key contextual factor targeted	Tailored implementation strategy suggested by participants	Implementation strategy mapped to ERIC
Tension among participants as to whether all leadership and staff levels should be targeted; base-level clinicians described as often being the first to observe low value care while mid-level leaders and above have a system-wide view.	Ensure all appropriate leadership and staff levels can join the ECHO® network, and/or provide alternative opportunities as appropriate.	Tailor strategies
Staff do not feel safe to raise low value care in the workplace.	Co-deliver the innovation in partnership with a related High Value Conversations course.	Tailor strategies
More support needed to foster psychological safety in sessions, particularly for the case study presenters.	Have a formal support process for those delivering a case study and for panel members. Expand network beyond a single participating health service to increase diversity of attendees and enhance safety to share experiences and ideas.	Facilitation Stage implementation scale up
Limited support available for staff to apply the toolkit in practice.	Provide ongoing support from those who developed the toolkit through, for example, one-to-one mentoring or conducting a project in partnership.	Provide ongoing consultation
Many competing educational/professional development opportunities and meetings concurrently delivered at the study site and through Queensland Health (state government's public health system). It can be hard for opportunities to stand out and for staff to know which opportunities they should prioritise.	Support hospital staff to champion participation in the ECHO® network (identifying/endorsing case study presentation ideas and/or general attendance) and use of the toolkit. Have executive leadership promote the ECHO® network and/or attend as a guest (e.g., incentivise use of the toolkit in practice through the Division of Strategy and Transformation team who have executive level influence).	Identify and prepare champions Involve executive boards Alter incentive/allowance structures
Unsupportive team or departmental culture, with attendance constrained by clinical workload coverage requirements and/or lack of line manager support.	More support is needed from the organisation, particularly at the executive level, for clinical staff to attend these opportunities.	Assess for readiness and identify barriers and facilitators Involve executive boards
Communication and promotion around the availability of the course appeared limited and it was unclear who the target audience was (i.e., base-level clinicians or beyond). It was also unclear for some about how the ECHO® was structured in general and what participation involved as a network member and/or panellist.	Improve communication and promotion of the ECHO® network at the study site (e.g., through the site's communication engagement team's weekly email, Clinical Counsel meetings, Queensland Health), with clear communication around who the series is targeted at and what is involved in participation.	Tailor strategies
ECHO® network sessions were delivered on the busiest clinical day (Thursday) which was not optimal for some.	Schedule ECHO® network sessions at a more ideal time. Other key times to avoid included peak winter illness periods, school holidays, and the end of the year.	Not matched to an ERIC implementation strategy

I think the two need to be combined. Because High Value Conversations provide a communication framework for people to have…challenging conversations…probably 99 per cent of conversations about low value care are challenging conversations …The gap is, we don't feel safe enough to raise it… – Allied health professional, ID 03

Provided by an external organisation to the study setting, the program was available to the public for a fee and was intended to equip participants to speak up about safety concerns, challenge unsafe behaviours regardless of hierarchy, and promote a culture of safety.

Local champions were identified as a potential strategy to increase awareness of the ECHO® network, including to executive staff, and to encourage attendance and case study delivery:

…having the champion to use it I suppose…some of the speakers that spoke at the past five ECHO®s…so they can potentially be a champion, they can potentially market it for you in different…settings, because there's a lot of meetings at QCH…

– program manager, ID 06

[Table 6 about here]

Discussion

This multi-methods study evaluated implementation of a high value care toolkit through the ECHO model™ to support the identification of low value care, examining contextual factors and implementation outcomes. Use of the ECHO model™ for this purpose was novel within the target health service, where ECHO® networks typically focused on clinical topics (e.g., Adolescent Mental Health, Palliative Care) rather than health service improvement. It is also novel within the international ECHO® community, with no known examples of other health service improvement toolkits being disseminated using the ECHO model™ (11).

Participants consistently identified organisational culture as a critical element influencing both engagement within the pilot ECHO® network and implementation of the toolkit in practice at multiple levels of the organisation. Participants described this organisational culture only in broad terms but consistently associated it with a lack of psychological safety. The early identification of this contextual factor by the study team resulted in establishing additional strategies to support psychological safety within the ECHO® network including case study facilitation. Participants perceived the pilot ECHO® network as aligning with both organisational strategic priorities and recent healthcare initiatives (e.g., The Queensland Health Allied Health Framework for Value-Based Health Care (34)).

Organisational cultures and climates in value-based care and clinical education

Organisational culture is defined as a collective mindset, shaped by both visible and invisible elements, that defines the character and functioning of an institution (35, 36). The participants in our study referred most often to underlying assumptions or unconscious beliefs that influence how staff think and feel. According to Schein's Model of Culture, these are the ultimate source of values, actions, and motivation in organisations; and are also the hardest to unearth and understand (37). In contrast, organisational climate refers to the collective interpretation that members of an organisation give to the events, policies, practices, and procedures they encounter, along with the behaviours they observe being encouraged, rewarded, and expected (38). Participants in this study described organisational culture and climate as multifaceted, referencing intersecting cultures at professional and disciplinary levels. These layers were further complicated by organisational climate factors such as time pressures, resource availability, and approval processes. Collectively, these elements hindered participants' perceived ability to implement the toolkit in practice, with low or limited psychological safety (39) identified as the most prominent barrier. A sense of safety is fundamental in educational settings where learners are encouraged to question established norms and share insights to facilitate collective learning (40). Likewise, clinicians feeling secure to share insights, question practices, and engage in innovation has been reported as essential to advancing high value care (41). As part of this, leadership has been identified as a key factor influencing the fostering of psychological safety and health service change initiatives (42), and is a key priority for future implementation efforts. The predominance of allied health professionals among the pilot ECHO® network members may reflect existing executive level support of high value care approaches, reinforcing the importance of leadership alignment in driving change.

Toolkit-based interventions and value-based care

Toolkits are a common form of knowledge translation used in healthcare to prompt change (43). The effectiveness of knowledge translation strategies is highly context-dependent, and rigorous evaluation of outcomes and contextual influences is essential, yet often lacking, for determining whether such efforts achieve their intended goals (5). Research evidence suggests that passive dissemination of toolkits has little effect (43). In this study, the toolkit was implemented within an established virtual community of practice model underpinned by the value of interactive case-based learning to drive practice change. This aligns with evidence for effective interventions to reduce low value care: bottom-up approaches, such as clinician education and decision support tools have been more successful than top-down strategies (e.g., regulatory and financial disincentives) when implemented as part of multicomponent interventions tailored to local settings (19). It has been suggested that combining system-level incentives with context-sensitive, clinician-focused strategies offers the most promise for sustainably reducing low value care (44). The findings of this implementation evaluation suggest that our intervention is likely to be more effective when the organisation's cultures and climates support evidence-based innovation; and the needs of hospital staff related to this are addressed, including ongoing facilitation to support application of the toolkit in practice.

Practical implications and future directions

Our findings underscore the importance of: (1) understanding organisational cultures and climates and how an innovation may fit within these; (2) recognising and supporting psychological safety as a key factor in both learning and applying change initiatives within healthcare environments; and (3) implementing toolkits through a participatory process to ensure meaningful engagement and contextual adaptation. Collectively, our findings highlight the nuanced and context-dependent nature of implementing interventions to reduce low value care within complex healthcare systems.

An existing approach that aligns with the study findings is the Leadership and Organisational Change for Implementation (LOCI) intervention which provides a structured, evidence-informed approach to developing leadership capacity to support the implementation of evidence-based innovations (42). LOCI targets mid-level leaders who supervise frontline clinicians and often lack formal leadership training, consistent with the target group in the current study. The aim is to cultivate a strategic implementation climate where (1) there is a shared understanding of the importance of the innovation implementation across all employees, and (2) organisational structures and processes align with effective implementation and sustainment (43). LOCI incorporates leadership training and coaching, alongside collaborative strategy development across organisational levels; and explicitly aims to enhance psychological safety (45). This approach should be considered alongside study participant feedback regarding the targeting of mid-level leaders for both the Moving Towards High Value Care toolkit and pilot ECHO® network. While engaging this group may enable change through their authority and contextual insight to address low value care, it must be balanced against the risk of reinforcing hierarchies that reduce psychological safety (46).

Consistent with our findings, Nilsen and Kirk (34) emphasise the need to put culture front and centre of understanding why evidence-based practices succeed or fail. This requires critical examination of culture at organisational, professional, and disciplinary levels, including informal norms and values, professional identity claims, and everyday notions of legitimacy and appropriateness (36). Suggested implementation strategies include tailoring interventions and using cultural facilitators, both reflected in our findings. Another key strategy is stakeholder engagement in the development of evidence-based practices (34). This occurred to some extent through the target health service's involvement in the toolkit development prior to the pilot ECHO® network. This strategy could be extended by further adapting the toolkit to specific services or clinical areas, as proposed in the original toolkit development work.

At an average cost of $499 per participant, the use of the ECHO model™ may be considered relatively low-cost compared with other training programs and initiatives (47). While documenting the subsequent cost savings generated by participants applying the knowledge in real-world settings was beyond the scope of this study, these savings have the potential to substantially outweigh the intervention costs and warrant investigation in future studies.

Strengths and limitations

This implementation evaluation offers several strengths including the novel application of a toolkit via a virtual community of practice aimed at increasing value in healthcare grounded in a real-world hospital and health service context, and the use of established implementation frameworks that enhance the credibility and transferability of our findings. Qualitative data enabled the generation of insights into contextual factors influencing the uptake of the pilot ECHO® network. However, limitations include lower than expected participation in the six sessions and potential self-selection bias from a small interview sample. Time and resource constraints (the project had funding for one year) influenced the decision to limit implementation to a single paediatric hospital and health service. Future studies and investment for sustainability should allow for sessions to run over a longer period (e.g., minimum of 10–12 over 12 months) and across multiple organisations, consistent with other ECHO® networks that have been sustained (11).

Conclusions

Delivering the Moving Towards High Value Care toolkit through the ECHO model™ shows promise but is strongly shaped by organisational culture, psychological safety, and leadership. The project aligned with the study site's strategic priorities; however, cultural barriers and hierarchical dynamics limited participants' ability to engage in the pilot ECHO® network and apply the toolkit in practice. Future efforts may benefit from longer implementation periods and tailoring networks to different professional levels. Together, these findings reinforce evidence that toolkit-based interventions are most effective when paired with deliberate strategies that address the organisational contexts in which users work.

Abbreviations

Abbreviation	Term in full
AusHSI	Australian Centre for Health Services Innovation
CHQ	Children's Health Queensland
ECHO	Extension for Community Healthcare Outcomes
QUT	Queensland University of Technology

Declarations

Ethics approval and consent to participate

This study was performed in accordance with the Declaration of Helsinki and approved by the Children's Health Queensland Hospital and Health Service Human Research Ethics Committee (HREC/24/QCHQ/104909). Written consent was obtained from participants prior to commencing an interview.

Consent for publication

Not applicable.

Availability of data and materials

The participants of this study did not give written consent for their data to be shared publicly, so due to the sensitive nature of the research supporting data is not available.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

KY: formal analysis, writing-original draft, writing - review and edit, visualisation. EH: formal analysis, methodology, investigation, writing-review and edit. PM: conceptualisation, resources, writing-review and edit, supervision, funding acquisition. EB: resources, data curation, writing-review and edit, project administration. QX: formal analysis, writing-review and edit. HC: formal analysis, writing-review and edit, supervision. SM: conceptualisation, methodology, writing-review and edit, supervision, funding acquisition. ZT: conceptualisation, methodology, investigation, writing-review and edit, supervision, funding acquisition.

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Figures

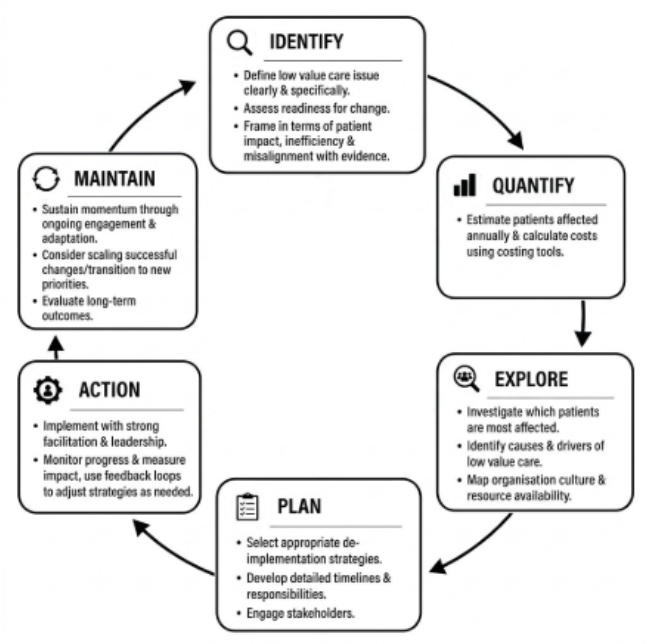


Figure 1

The six stages of the Moving Towards High Value Care Toolkit (4)

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