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Barriers and Facilitators to Implementation of Cross-Sectoral Virtual 4-Party Meetings in Emergency Departments. A Qualitative analysis within the Consolidated Framework for Implementation Research

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Abstract

Background

Caring for older adults with multiple chronic conditions requires coordination across healthcare sectors. Virtual four-party meetings, involving hospital staff, municipal providers, general practitioners, patients, and relatives, may strengthen cross-sectoral collaboration during hospital admission and discharge. However, implementing digital cross-sectoral interventions in emergency departments is challenging due to fast-paced workflows and organizational complexity. This study explored anticipated implementation determinants for video meetings in emergency department settings to support early implementation planning.

Methods

In this qualitative pre-implementation study, healthcare professionals from hospitals, municipalities, and general practice participated in interdisciplinary workshops at two Danish emergency departments. A SWOT-informed approach was used to identify perceived strengths, weaknesses, opportunities, and threats. Findings were analyzed deductively using four domains of the Consolidated Framework for Implementation Research: Innovation, Outer Setting, Inner Setting, and Individuals.

Results

38 professionals participated. 18 constructs were identified across the four domains. Anticipated barriers included the complexity of emergency departments' workflows, short admission times, limited availability of general practitioners, poor interoperability between hospital and municipal electronic record systems, and insufficient resources for cross-sectoral coordination. Anticipated facilitators included perceived relative advantage through improved collaboration and patient involvement, relational trust between sectors, and leadership engagement. Participants highlighted the importance of reliable digital platforms, structured facilitation, and equity-focused approaches to ensure inclusive participation.

Conclusions

Virtual four-party meetings are seen as innovative but complex, with potential to enhance cross-sector coordination in emergency departments. Its success relies on leadership backing, technical integration, and focused strategies to overcome organizational and digital challenges for broader adoption.

Contributions to the literature

- This study provides pre-implementation insights into the barriers and facilitators that healthcare professionals expect to encounter when implementing V4M.
- It demonstrates how the CFIR framework, combined with a participatory SWOT approach, can reveal organisational readiness, contextual factors, and ethical dimensions relevant to V4M implementation.
- The findings can guide early implementation planning, highlighting the need for visible leadership, technical interoperability, and equity-oriented strategies.

Background

By 2030, demographic projections indicate a 30% increase in the proportion of people aged 75 and older in xxx (1). At the same time, a growing number of individuals face complex multimorbidity, defined as having two or more chronic conditions requiring coordinated care across porfessionals, disciplines and health care sectors (2–5).

Emergency departments (EDs) serve as the main entry point for acutely ill patients who require hospitalization or short-term care, with a significant portion of patients assessed, treated, and discharged directly from the ED without admission (6). Recently, the organization of acute hospital services in Denmark has led to shorter inpatient stays, with up to 70% of patients in the ED discharged within 24 hours (7). Brief ED stays and care transitions across disciplines and sectors are critical points associated with a higher risk of adverse patient outcomes (8–11). These critical points are associated with increased patient insecurity, medical errors, and a higher risk of readmission (4,8,12).

Patients in acute or vulnerable situations, including during or following an ED visit, may encounter inadequate communication, limited knowledge transfer, and insufficient information sharing across care transitions, which may further compromise patient safety and well-being (13–15). It is also well known that a lack of coordination and cooperation leads to different treatment goals and uncertainty for the patient and their family (4). Therefore, improved collaboration among healthcare professionals (HCPs) across disciplines and sectors, including working together toward shared goals, is essential to address the complex needs of patients with multimorbidity.

The xxxx Health Authority and World Health Organization recommend virtual communication to enhance coordination, joint assessment, and intervention planning following discharge from EDs (16). One proposed approach is Virtual Four-Party Meetings (V4M), structured video-based meetings involving patients, relatives, hospital professionals, municipal healthcare providers, and general practitioners. Previous research suggests that such meetings can

improve communication, align care planning, and increase patient involvement (6) (17) However, little is known about the feasibility of implementing virtual cross-sector meetings in fast-paced ED settings.(6)(6)

The ED is a pivotal setting where care fragmentation often begins, making it essential for implementing V4M to strengthen cross-sector coordination—especially for the many acute, vulnerable, and older patients who are transferred or discharged after short hospital stays.

Research indicates that implementing new practices in healthcare is rarely straightforward (18). Up to 70% of organizational changes fail (19), especially when they involve multiple professional groups, sectors, and virtual solutions (15,17,20–23). Identifying contextual barriers and facilitators is a key step in successful implementation of healthcare innovations(24). This study aims to explore healthcare professionals' anticipated barriers and facilitators to implementing V4M in emergency departments.

Methods

This qualitative, observational study combined a SWOT data-collection approach with the Consolidated Framework for Implementation Research (CFIR) (25) to explore anticipated barriers and facilitators to implementing V4M in EDs. The CFIR framework is particularly well-suited for examining complex organizational settings involving multiple stakeholders (22), as is common in healthcare implementation research (26). SWOT findings were deductively mapped onto relevant CFIR domains and constructs through a structured analytic process, whereby identified strengths, weaknesses, opportunities, and threats were systematically aligned with CFIR's conceptual categories to enhance analytical depth and theoretical coherence.

Danish healthcare setting

The Danish healthcare system is tax-funded, with general practitioners (GPs) serving as the primary medical contact for residents. GPs coordinate care and refer patients to specialized and acute hospital services. EDs serve as the primary entry point to hospital care, providing immediate assessment and treatment of acute illnesses and injuries. They are equipped with beds for short-term admissions, whilst patients requiring longer treatment are transferred to specialist departments within 48 hours (27). For patients being transferred across sectors, an electronic discharge summary is routinely provided to the patient's GP as part of standard cross-sector collaboration. This summary includes diagnoses, a concise overview of the hospital stay, and recommended follow-up. Simultaneously, an electronic discharge report is sent to municipal healthcare services, outlining the patient's needs for home care, nursing, or rehabilitation. However, this exchange of documents does not guarantee real-time communication or coordinated decision-making across sectors, limiting opportunities for joint planning that addresses the patient's needs, including responsibility for pending tests or referrals, in clear and accessible language

V4M intervention

V4M is a structured, 30-minute video-based intervention designed to enhance user involvement and coordination in discharge planning for older adults with multimorbidity (17). The meeting brings together four key parties: (1) the patient and one or more relatives, (2) hospital professionals (a nurse and a physician), (3) a municipal healthcare nurse, and (4) the patient's GP. The purpose of V4M is to establish a shared understanding of the patient's health status, priorities, and care needs before discharge, ensuring that all responsible parties agree to the coordinated plan. The central question that guides the discussion is: "What is most important to you right now?" This question encourages the patient to share concerns and preferences that can guide goal setting and care planning (28).

Furthermore, health professionals across sectors contribute by assessing the need for transitional care and, for very ill patients, terminal and spiritual care. Meetings will often be held in the patient's hospital room, with the patient and relatives physically present. Relatives contribute essential contextual knowledge about the patient's daily functioning and preferences, support shared decision-making, and help ensure that the care plan fits the patient's needs and the family's capacity to provide support. The GP and the municipality's healthcare professional participate via a secure videoconference platform. Each meeting is expected to last approximately 25–35 minutes and follows a standard agenda to ensure that all key domains are covered: 1. Patient's primary concerns and priorities; 2. Summary of hospital treatment and status; 3. Discussion of follow-up care and allocation of responsibilities; 4. Agreement on next steps and confirmation of contact persons. A hospital nurse will facilitate each session, ensuring that all voices are heard and that the meeting concludes with a clearly defined action plan. Each meeting will be concluded with a written summary confirming responsibilities across sectors. This summary will be given to the patient and their family, shared digitally with all participants, and uploaded to the electronic health record to ensure transparency, continuity, and accountability (17,28).

Sampling and participants

The study was conducted at two EDs in the Region of Southern Denmark: Hospital Lillebaelt (SLB) and Hospital Soenderjylland (SHS). SLB serves approximately 300,000 residents and collaborates with six municipalities, while SHS serves approximately 230,000 residents and works with four municipalities. HCPs with influence and/or decision-making authority regarding the future implementation and delivery of the V4M were recruited through purposive and snowball sampling to ensure representation across sectors and disciplines (29,30). All participants routinely used electronic tools in their daily clinical practice, such as electronic health records and digital communication systems. However, only a few participants had prior experience with virtual consultations, and none had experience with V4M. This distinction is important, as participants were generally familiar with digital work practices, whilst the specific format of a virtual four-party meeting represented a novel intervention. Two local research nurses (RB, DO) invited leaders, physicians, and nurses from hospitals and municipalities, as well as municipal healthcare coordinators, nursing home leaders, and general practitioners to participate. The invitation was sent by email to the heads of the municipalities, who forwarded the email to the relevant actors. Participants' assessments were completed after a brief introduction to the V4M model.

Data collection

Two-hour workshops were conducted at both EDs in August 2024, facilitated collaboratively by research nurses (DO, RB) and implementation researchers (CA, ME). These workshops offered structured settings for creative group reflections (29), fostering user participation by allowing participants to share their perspectives while actively listening to one another (31). The purpose of these workshops was to generate valid and reliable data concerning future solutions and organisational changes. (32,33)

In both workshops, participants were divided into groups of five to six individuals, ensuring diversity across professional backgrounds and sectors to promote cross-disciplinary and cross-sectoral dialogue.

The SWOT framework, analysing internal factors (Strengths and Weaknesses) and external factors (Opportunities and Threats), served as a structured approach to guide the exploration. This approach is well known among many practitioners and is suitable for mapping internal and external factors, whilst encouraging reflection on organizational resources and contextual challenges (34,35). After a brief introduction to the study's purpose and the intervention, V4M, four interactive rounds were completed (one for each internal and external factor). Participants were prompted to identify and elaborate on factors pertinent to each SWOT category, facilitating a comprehensive understanding of anticipated barriers and facilitators. Participants were instructed to assess internal and external factors from the perspective of their own workplace, acknowledging that settings can vary across organizational contexts. The group discussions were audio recorded, and each group created written Post-it notes summarizing the main points. After completing the four group sessions, all Post-it notes were collected and placed on large sheets, one for each part of the SWOT framework: Strengths, Weaknesses, Opportunities, and Threats. At the end of the workshop, a plenary session, facilitated by the implementation researchers (CA, ME), was held, during which all groups shared their key findings. This session allowed participants to reflect and discuss together, reviewing, refining, and reorganizing the Post-it notes within the SWOT categories to develop a shared understanding of the main themes.

Data analysis

The SWOT data were analysed deductively using the CFIR, a comprehensive framework for identifying, organizing, and understanding factors that influence implementation (36). CFIR consists of five domains: intervention characteristics, outer setting, inner setting, characteristics of individuals involved, and the implementation process.

The analysis focused on the first four of the five CFIR domains, as the fifth domain (implementation process) was not relevant in this pre-implementation phase. Before the analysis, the inner setting was defined as the organisations directly involved in the V4M meetings, representing multiple distinct work environments and professional subcultures due to the study's cross-sectoral context. Examples of inner settings included specific departments, wards, and local management structures where participants operated, along with their internal communication patterns, routines, and implementation climates. In contrast, the outer setting was defined as the broader contextual environment, including the hospital or municipality, regional political structures, and the national Danish healthcare system.

At each ED, after reaching consensus on a defined training dataset, two sets of coders (DO/CA, RB/ME) coded site-specific data using Post-its and handwritten notes. Coding and interpretation based on the Post-it notes were repeatedly validated through consensus within the research team (DH, CA, CL, DO, RB, ME) to improve the credibility and transparency of the findings. Additionally, audio recordings were carefully reviewed to support and deepen the analysis. The audio files were also used when the Post-it notes were difficult to understand or when further explanation was needed.

Ethical Considerations

In accordance with the Helsinki Declaration, participants received verbal and written information about the study (37). The information explained the study's purpose, procedures, voluntary participation, and participants' rights. Informed consent was obtained from all participants, and participants could withdraw from the study at any time without repercussions. Under Danish law, this study did not require ethical approval from the National Committee on Health Research Ethics §14, 2 ("Committee on Health Research Ethics, 2011). It was registered with the Records of Processing Activities in the Region of Southern Denmark for research and quality projects (registration number 24/41910), and the data were stored on a secure server accessible only to the study's researchers.

Results

Two workshops were held, attended by 38 participants: 26 from SLB and 12 from SHS. Hospital attendees included four leaders, five physicians, and five nurses. Municipal attendees included five nursing team leaders, five municipal acute care nurses, five healthcare coordinators, four leaders, three nursing home nurses, and two general practitioners. Each session lasted two hours.

Anticipated Barriers and Facilitators

Using the CFIR framework on the workshop data, the **analysis mapped 18 CFIR constructs across the four domains**, including 15 anticipated barriers and 13 anticipated facilitators for implementing V4M (see Table 1). The following results section outlines these constructs.

Table 1: The anticipated barriers and facilitators of virtual four-party meetings

Table 1

Innovation Characteristics

Barriers to implementing V4M were identified across three constructs: *relative advantage, complexity, and cost* (see Table 1). Participants noted that video use may cause discomfort or insecurity for patients and HCPs, and temporary healthcare workers unfamiliar with the patient may reduce the perceived value of meetings. Coordinating multiple professionals across sectors is challenging due to differing schedules, and diverging agendas, which can complicate adherence to a shared agenda and timeframe. Aligning participants' schedules takes time, and meetings may be cancelled due to unavailability. Additionally, unclear roles and responsibilities may lead to unequal participation or misunderstandings, and important decisions, such as determining treatment levels, may be rushed without thorough discussion.

Facilitators to implementing V4M were identified across five constructs: *relative advantage, adaptability, complexity, design, and cost* (see Table 1). Participants described characteristics of V4M that may facilitate its implementation. It can increase patient and relative involvement, enhance safety, and increase satisfaction compared with usual care. The V4M enables flexible, timely planning of cross-sectoral meetings, provides a shared agenda and a comprehensive patient plan, and allows corrections during meetings, supporting accurate information transfer and efficient coordination. It also accommodates participation of distant family, reduces travel and duplication of information, and promotes early, coordinated planning. Furthermore, V4M encourages cross-sectoral learning and professional sparring, offering a more transparent structure and fostering collaboration beyond existing workflows.

Outer Setting

The analysis identified three constructs related to outer setting barriers: *local conditions, policies and laws, and external pressure* (see Table 1). The participants identified several barriers in the outer setting that may hinder the implementation of V4M. Technical incompatibilities between IT systems across sectors and poor internet connection in some locations can disrupt meetings and hinder participation. Short hospital stays and high patient load across sectors may limit the time available to plan or attend virtual meetings. At the same time, organisational or financial agreements can further complicate coordination. Implementation can also be challenged by variation in IT systems and procedures, difficulties in obtaining consent, and sharing data across sectors. Finally, V4M may be perceived as one among multiple competing intervention, thereby reducing prioritisation and engagement.

Inner Setting

Within the Inner Setting, barriers to implementation were identified across four constructs. *Structural Characteristics, Communications, Compatibility, and Available Resources.* Participants highlighted that variations in daily routines and workflows across hospital departments and primary care may create coordination challenges. Disseminating information to a GP was described as challenging due to the large number of independent practices. Scheduling may be constrained by limited GP availability and competing priorities, and resources for supporting cross-sector virtual meetings can be limited, further complicating planning and participation.

Facilitators (to implementation) were mapped to six constructs in the Inner Setting domain: *Structural Characteristics, Relational Connections, Communications, Compatibility, Mission Alignment, and Available Resources*. Participants identified existing structures and routines that may support V4M implementation. Fixed conference times may reduce coordination efforts, while established collaboration between municipal acute care nurses and the ED can foster trust, familiarity, and efficient cross-sector coordination. Familiarity with the virtual meeting system may support smooth implementation across sectors, and regular contact between sectors further supports timely information sharing. Participants also emphasized that shared commitment to patient care allows healthcare professionals with limited time to participate effectively. Furthermore, municipal visitation teams' planning capacity and coordinators in the EDs, with V4M knowledge and allocated time, can enhance smoother transitions and follow-up planning.

Individuals

Four barriers were mapped to the Individuals domain: *Need, Capability, Opportunity, and Motivation.* Participants recognized several potential individual-level challenges. Variations in HCPs' skills and familiarity with the virtual meeting system may require training and moderation to ensure effective facilitation. Misalignment of expectations and diverse family perspectives can complicate decision-making, while patients with limited understanding or capacity may face difficulties engaging. Participants also noted that patients with very active families in relation to patient care may receive preferential access. Resistance to new practices and negative experiences with virtual meetings may limit engagement and reduce relational closeness compared with in-person contact.

Within the Individuals domain, one facilitator was identified under the Capability construct. Participants discussed how V4M could facilitate the involvement of multiple relevant healthcare professionals and family members, enhancing collaborative decision-making.

Discussion

This study explored the barriers and facilitators to HCPs' implementation of V4M in EDs. *Our findings align and diverge from previous studies that describe the implementation of similar cross-sectoral digital intervention (13,26,27).* Our findings demonstrate that implementation in this context is likely to be shaped by a complex interplay of technological, organisational, relational, and ethical factors. Consistent with existing literature on digital health implementation (38,39), our findings indicate concerns about technical stability, interoperability, and workload. At the same time, participants described clear advantages of V4M, including strengthened cross-sector collaboration, enhanced patient and family involvement, and improved continuity of care. Beyond these expected considerations, this study offers two novel insights. First, findings suggest that V4M could challenge established professional boundaries by making clinical and organisational decision-making visible across sectors. Decisions that are typically confined to hospital, municipal, or general practice settings would be discussed jointly, potentially redistributing authority and requiring professionals to justify their assessments in a shared forum, an issue rarely addressed in previous research. Second, our findings highlighted participants' concerns about equity, noting that frail older patients with limited understanding or capacity

may have difficulty engaging in V4M meetings with multiple HCPs. These findings contribute to the knowledge base, highlighting the organisational and ethical tensions that may arise even before implementation begins.

Within the CFIR domain of *innovation characteristics*, *complexity* emerged as the most prominent barrier. Participants in this study highlighted the substantially narrower coordination window (due to shorter admission times) compared with V4M implementations in non-acute departments (17). In contrast, other cross-sectoral digital interventions, such as virtual ward rounds, transitional care video meetings, or app-based coordination tools, typically allow longer planning horizons and are embedded in more stable clinical trajectories, thereby reducing implementation and coordination complexity (25,40). Coordinating multiple HCPs across sectors within the short admission times was considered to be logistically demanding and time-consuming. The limited availability of GPs further exacerbated these challenges, narrowing the practical window for planning and conducting V4M.

Our findings build on prior research (39,41) on virtual consultations in outpatient and chronic care settings, demonstrating that comparable mechanisms such as structured, multidisciplinary communication and shared decision-making also operate in hospital-based and acute care settings (42). Consistent with Collet et al. (43) and Anaraki et al. (44), our results also identify complexity and misalignment with existing workflows as key barriers to implementation. Despite these obstacles, the findings reveal significant advantages that could facilitate adoption. Compared to current discharge coordination practices, V4M was regarded as a structured, patient-centered approach that improved communication, clarified roles, and enhanced safety through early joint planning. These perceptions align with those of Wentzer et al. (17) and Collet et al. (43), who found that intervention that enhance shared understanding and patient involvement are viewed as major facilitators. However, Collet et al. (43) also mentioned that maintaining engagement requires transparent governance and ongoing feedback mechanisms, insights that are likely equally relevant for scaling V4M.

Our study identified expected barriers in the outer setting, such as fragmented IT systems, policy misalignment, and time pressures due to high patient flow. These findings align with a systematic review on multidisciplinary transitional care interventions (43), which identified interoperability issues, unclear reimbursement structures, and limited leadership support as common obstacles. Our study emphasised that competing priorities and insufficient managerial visibility undermined motivation for change, in line with **Anaraki et al. and Øvrefelt (44,45)**. Both studies highlight the necessity of visible leadership and clear priorities to sustain momentum in implementation. In contrast, facilitators within the *inner setting* reflected existing cross-sector relationships and shared professional values. These factors have also been noted in previous studies (43,46,47), suggesting that relational trust and collaborative culture can compensate for technical and organisational shortcomings. Thus, relational readiness and leadership visibility appear to be just as critical as technological preparedness.

Within the CFIR domain of individual *characteristics*, the findings highlight that barriers were associated with variations in digital competence, facilitation experience, and confidence in virtual communication. Our findings suggest that successful implementation would require targeted training in both technological and interpersonal skills to ensure equitable participation. These findings align with those of **Collet et al. (43)** and Anaraki et al. (44), who also identified that resistance to digital workflows was often rooted in previous negative IT experiences and was a key barrier.

Our findings reveal participants' ethical concerns regarding equality: resourceful caregivers may benefit disproportionately, whereas patients with limited digit This result aligns with insights from the original V4M study, in which Wentzer et al. (17) demonstrated that the facilitator's ability to guide the meeting structure, ensure balanced participation, and translate patient priorities into actionable plans was central to generating value for both patients and professionals. This study extends these findings by indicating that in an ED context, the facilitator's role becomes even more critical due to the time pressure, rapid turnover, and high complexity that characterise acute care. Thus, both studies converge in identifying structured facilitation as a core mechanism of V4M but diverge regarding the extent to which the level of dependency on the facilitator is amplified (higher in acute settings).

Our findings highlight key considerations for strategic approaches to support the implementation of V4M in EDs, align with the determinants identified in this pre-implementation study, and provide practical guidance for leaders, clinicians, and policymakers. The strategies are:

Visible and committed leadership: Active leadership presence and clear communication of priorities foster motivation and accountability.

Technical readiness: Stable digital infrastructure and interoperability are prerequisites for cross-sector collaboration.

Organisational governance and alignment: Clear governance structures and agreed workflows support coordinated implementation across sectors.

Competence development: Training in virtual facilitation and patient-centred communication strengthens professionals' capability to deliver V4M.

Champion engagement: The involvement of local champions may further support motivation, ownership, and sustained implementation across sectors.

Workflow integration and equity-focused support function through different mechanisms: incorporating V4M into existing routines may improve sustainability, while targeted support for vulnerable patients and relatives can help ensure equitable participation.

Utilizing these strategies collectively may enhance readiness across sectors and support the sustainable integration of V4M.

Contribution and future research

By positioning our findings alongside those of **Collet et al. (43)** and **Anaraki et al. (44),** this study expands the evidence base for implementing complex digital interventions in emergency and transitional care. Similar patterns have been reported in broader research on digital health implementation. **Greenhalgh et al. (48)** identified interoperability and lack of system integration as persistent barriers to large-scale technology adoption and highlighted organisational readiness, governance, and reimbursement as key determinants of telehealth sustainability. This study contributes to implementation research by demonstrating how participatory SWOT workshops combined with CFIR analysis can inform early implementation planning for

complex cross-sector digital interventions. Future research should assess how strategies such as visible leadership, technical alignment, structured facilitation, and an equity focus influence the adoption and sustainability of V4M and similar interventions. Comparative studies across hospitals and municipalities could further identify which contextual factors most strongly affect success.

When analysed together, the comparison between the present pre-implementation findings and the original V4M study (17) suggests that the facilitator role is not merely supportive but constitutive of the intervention itself. Whereas earlier V4M studies demonstrated that skilled facilitation enhances meeting quality, the current ED-focused findings indicate that, without a clearly identified facilitator, implementing V4M may be unviable. This distinction underscores that the "active ingredient" of V4M lies not only in the virtual format or cross-sectoral participation but also in the relational and organisational work performed by the responsible coordinator.

Strengths and limitations

A significant strength of this study is the broad participation across multiple disciplines and sectors, including healthcare professionals from two emergency departments, ten municipalities, and two general practices. This diversity enriched the data by incorporating a wide range of professional and organizational perspectives on the implementation of V4M. However, due to differences in organizational structures and workflows between EDs and municipalities, certain locally specific barriers and facilitators may not have been fully captured.

Purposeful and snowball sampling strategies based on predefined inclusion criteria ensured a heterogeneous sample, which was essential for reflecting the complexity of cross-sectoral collaboration (36). Nevertheless, these recruitment methods may have introduced bias by attracting participants who are particularly motivated or positively inclined toward intervention. Nevertheless, the findings revealed more barriers than facilitators, suggesting that overly optimistic selection was limited.

Bringing heterogeneous participants together in mixed groups fostered dynamic interaction, revealed shared challenges, and surfaced divergent viewpoints, thereby contributing to a more comprehensive understanding of the multifaceted implementation context. Although hierarchical dynamics and dominant voices can challenge group discussions, no such issues were observed during data collection.

Participants' perceptions of barriers and facilitators should be interpreted considering prior experience with digital tools and virtual care. Implementation research has consistently shown that individuals' knowledge, beliefs, and prior experience with an intervention influence how its complexity and feasibility are assessed (25,49). Although participants were generally digitally literate, limited experience with virtual consultations and none with four-party formats may have exacerbated concerns about coordination, workflow integration, and facilitation, suggesting an early stage of implementation rather than inherent limitations of the intervention (40,50).

The study's cross-sectoral nature initially complicated the distinction between internal and external factors in the SWOT and CFIR analyses. Through careful conceptual clarification and consistent application throughout analysis, clear definitions were established, thereby enhancing the study's validity and internal coherence. Integrating SWOT findings within the CFIR framework also presented opportunities and challenges. On the one hand, allowing participants to identify strengths, weaknesses, opportunities, and threats encouraged open dialogue and generated insights beyond predefined CFIR constructs, thereby enriching contextual understanding (36). On the other hand, the SWOT approach did not fully capture all CFIR constructs either because specific determinants were not salient in this context or because of methodological limitations inherent to the SWOT approach.

Finally, the use of researcher triangulation, combining perspectives from qualitative, acute medical, and implementation science researchers, strengthened the credibility and depth of the findings, supporting a nuanced, contextually grounded interpretation of the results.

Conclusion

In conclusion, this pre-implementation study provides insight into the barriers and facilitators likely to influence the implementation of V4M in EDs. While V4M was perceived as enhancing collaboration, communication, and patient and family involvement, the acute, fragmented nature of ED workflows will make coordination challenging. Anticipated barriers, including technical instability, limited cross-sector resources, and unclear governance, highlighted the need for strong leadership, adequate resource allocation, and structural alignment across sectors. Successful implementation will rely on engaged leadership, robust digital infrastructure, clearly defined workflows, and equity-oriented strategies that support patient involvement. These findings can guide future planning and proactive mitigation of challenges prior to real-world rollout.

Declarations

Ethics approval and consent to participate.

The study was conducted in accordance with the Declaration of Helsinki. Under Danish law, this study did not require ethical approval from the National Committee on Health Research Ethics (§14, 2, Committee on Health Research Ethics, 2011). The study was registered in the Records of Processing Activities in the Region of Southern Denmark for research and quality projects (registration number 24/41910). All data were stored on a secure regional server accessible only to the research team. All participants received written and verbal information prior to participation and provided written informed consent. Participation was voluntary, and participants could withdraw at any time without consequences.

Consent for publication

Not applicable. The manuscript does not contain identifiable individual data.

Availability of data and materials

The datasets generated and analysed during the current study are not publicly available due to institutional data protection regulations and the potential risk of indirect participant identification but are available from the corresponding author on reasonable request and subject to approval from the Region of xxxxx.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

DH, ME, CL, and CA conceptualised the study. DO and RB facilitated data collection. DO/CA and RB/ME conducted the coding and analysis. All authors (JS, STS, CBM, CA, DH, RB, DO, CL) contributed to data interpretation, critically revised the manuscript, and approved the final version.

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Table

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