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Strategies and facilitating and hindering factors in the implementation of sustainable delirium management in acute care: A holistic multiple case study

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Abstract

Background

Delirium is a common and serious complication in hospitalized patients. It is associated with prolonged hospital stays, increased treatment costs, stress for patients and their families, and challenges for the interprofessional care team. Multicomponent intervention strategies have been shown to improve delirium prevention and treatment. Despite their effectiveness, implementation is not always successful. Evidence suggests that strong management support and effective interprofessional collaboration facilitate adoption, whereas structural barriers and staffing challenges hinder the sustainable integration of delirium management practices. In German-speaking countries, research on strategies for sustainably implementing delirium management and the factors influencing its implementation remains limited. The aim of this study was to investigate and compare strategies and factors that facilitate or hinder sustainable delirium management in four hospitals in German-speaking countries.

Methods

Qualitative research was performed using a holistic multiple case study design. In October–December 2024, eight guided interviews were conducted with nurses and physicians from four hospitals in German-speaking countries. All participants were involved in delirium management at their respective institutions. The interviews were transcribed and analysed using Schreier's eight steps of qualitative content analysis. Both within-case and cross-case analyses were conducted to enable cross-institutional comparison of the findings.

Results

The analyses identified a wide range of strategies for sustainable delirium management, including interprofessional collaboration; networking; a person-centred approach; training and learning formats; practical delirium guidelines; and integration of components such as delirium screening, orientation aids, and family involvement. Additional strategies included the use of specific roles, the availability of resources, and multi-year concept development accompanied by continuous refinement of key strategies. The most important facilitating factors were interprofessional collaboration, managerial support, growing expertise in the field of delirium, and long-term strategic priority. Hindering factors included limited acceptance of specialized nursing roles, work overload, knowledge gaps regarding delirium, structural barriers, and shortages of time and staff.

Conclusion

Sustainable delirium management relies on the interaction of multiple complementary strategies. Several facilitating and hindering factors can influence the sustainability of delirium management in acute care. The results underscore the need to establish delirium management in acute care as a long-term strategic priority supported by adequate resources.

Background

According to the ICD-11, delirium is characterized by disturbances in attention, orientation, and consciousness. It typically develops within a short period of time and manifests itself as significant disorientation or global neurocognitive impairment with transient symptoms, depending on the underlying cause or aetiology (1). Delirium results from a complex interplay between predisposing factors (e.g., pre-existing cognitive impairment, advanced age, and multimorbidity) and precipitating factors, such as surgery-induced inflammation, perioperative immune responses, acute infections or substance withdrawal from alcohol or illicit drugs. The prevalence of delirium in hospitalized patients varies between 18% and 88% depending on the clinical specialty and predisposing and/or precipitating risk factors (2, 3). Delirium is associated with negative outcomes such as a prolonged hospital stay and substantial treatment costs (4). It places a considerable burden on affected individuals and their relatives while posing considerable challenges for interprofessional treatment teams (5, 6).

In recent years, the prevention and treatment of delirium have increased in importance worldwide (7–10). An international study revealed that 67% of the 1,664 examined wards applied guidelines for delirium management (11). A further study revealed that in four hospitals in the DACH region (Germany (D), Austria (A), and Switzerland (CH)), 58% of wards used validated delirium assessment instruments, while 77% had delirium management guidelines in place (12).

Internationally, the Hospital Elder Life Program (HELP) and the ABCDEF bundle are widely used multicomponent intervention strategies with demonstrated effectiveness and economic efficiency in the prevention and treatment of delirium (13, 14). In the DACH region, some hospitals use HELP, sometimes in an adapted form, as well as selected components of the ABCDEF bundle (15, 16). Additionally, institutions in German-speaking countries apply several evidence-based delirium management programs that focus primarily on delirium prevention (17). The systematic use of delirium management guidelines or programs can significantly improve the course of delirium and help reduce its prevalence through non-pharmacological prevention and treatment measures (10, 18–20). According to the abovementioned study in the DACH region by Schimböck et al. (12), the most frequently mentioned measures for raising awareness and providing information about delirium included referring to delirium during shift handovers, having delirium experts available, and offering delirium training courses within the preceding year. Programs such as the Basel Dementia Delirium Program (18) and the Australian Confused Hospitalized Older Persons Program (21) fully address the internationally recommended intervention strategies (22).

Despite demonstrated effectiveness, the implementation of evidence-based, multicomponent strategies for the prevention and treatment of delirium often remains inadequate in clinical practice (23). One study examining the factors that promote and hinder the implementation of HELP identified management support and strong commitment within interprofessional teams as facilitating factors, whereas difficulties in integrating delirium management into existing structures and the need for changes in organizational culture were identified as hindering factors (24). Research on the implementation of delirium prevention programs in German-speaking countries has also identified facilitating factors such as targeted communication, adequate financial resources, and institutional awareness, in addition to barriers such as conflicting interprofessional collaboration and fragmented hospital processes (25).

Although these studies offer valuable insights, comprehensive analyses of strategies for the sustainable implementation of delirium management and the associated facilitating and hindering factors in everyday clinical practice within hospitals in the DACH region remain limited (12, 25).

Therefore, the aim of this study was to examine and compare the strategies used for the sustainable implementation of delirium management and the factors that promote or hinder these processes in four hospitals in the DACH region that differ in terms of their implemented delirium management and implementation procedures.

The following research questions were addressed:

- Which strategies contributed to the sustainable implementation of delirium management in the four participating hospitals?
- Which factors have proven to facilitate or hinder the sustainable implementation of delirium management in these four hospitals?

The findings of this study aim to contribute to a deeper understanding of the sustainable implementation of delirium management in hospitals and to identify key strategies and influencing factors. This study is a subproject of the international research program "Delirium Prevention in Acute Care," which aims to improve delirium prevention in German-speaking acute care hospitals (17).

Methods

Design

A qualitative research approach using a holistic multiple case study design was adopted. This approach enables an in-depth understanding and exploration of a phenomenon across multiple cases, as well as the reconstruction of social reality (26). Moreover, it enables the examination of cases within their real-world context, supporting a holistic and context-sensitive understanding and facilitating the identification of patterns, similarities, and differences across cases (27).

Setting and sampling

Purposive sampling was used to ensure that the sample was closely aligned with the research objectives (28). Casing is a key feature of case studies. In this study, the cases were defined by location, time, and activity (27). Drawing on a preliminary project involving 21 institutions (17), the project leaders selected four maximum-care hospitals representing different levels of care as the cases. Among the prerequisites for selection were that delirium management had already been implemented for several years and that the cases differed in terms of their implementation approaches and scope. To capture different perspectives within the four cases, at least one nurse and one physician from each institution were invited to participate. They were both required to be substantially involved in delirium management in their respective settings. While some participants were directly involved in the initial implementation of delirium management, others took responsibility for maintaining and further developing existing structures. In one case, two nursing professionals participated in the nursing section of the data collection at their own request to ensure a more differentiated nursing perspective. In line with the case study design, Table 1 provides an overview of the key contextual features of the cases examined and the characteristics of the study participants.

Table 1
Overview of key contextual features of the cases and characteristics of the study participants

Case	Case 1	Case 2	Case 3	Case 4
Country	Austria	Germany	Switzerland	Switzerland
Level of care	University hospital	University hospital	Central hospital	Regional hospital
DM implementation approach	Bottom-up	Bottom-up	Bottom-up	Top-down
DM implementation area	Selected area (ward area)	Selected area (perioperative area)	Entire institution	Entire institution
Study participants	Senior physician (f) and nurse (f)	Senior physician (f) and nurse (f)	Senior physician (f) and two nurses (f)	Senior physician (m) and nurse (m)
Specialist area of senior physician	Psychiatry	Anaesthesia	Internal medicine	Geriatrics
Training background of nursing specialist(s)	Graduate student in nursing science	Specialist training in dementia/delirium	Person 1: Master's degree in nursing science Person 2: Bachelor's degree in nursing science	Graduate student in nursing science

Key: DM, delirium management; f, female; m, male

Data collection and management

In total, the first author conducted seven semi-structured individual interviews, along with one additional semi-structured interview involving two participants. Semi-structured interviews enable a thematically focused yet open-ended exploration of individual perspectives (29), making them a suitable methodology for answering the research questions.

The interview guide was developed in a theory-driven manner according to the concept mapping of the Expert Recommendations for Implementing Change (ERIC) strategies (30) and the Consolidated Framework for Implementation Research (CFIR) (31) to ensure that key aspects of the strategies as well as factors that promote and hinder the sustainable implementation of delirium management in the four cases studied could be captured. ERIC comprises 73 implementation strategies for transferring evidence-based findings into health care practice (32). On the basis of these strategies, a concept map with nine thematic clusters was developed to facilitate the structured classification of implementation

strategies (30). The CFIR was used to identify factors that promote or hinder implementation processes and to enable a differentiated understanding of the influencing factors at various levels (31).

Two preliminary interviews with a research assistant from the Zurich University of Applied Sciences (ZHAW) and an advanced practice nurse (APN) were not included in this study. The first author conducted eight interviews between October 2024 and December 2024, with an average duration of 49 minutes. The interviews took place either on-site or online via Zoom meetings or Microsoft Teams; they were recorded with an audio device and transcribed verbatim according to established rules (33). MAXQDA 2024 software was used for data management and analysis (34, 35). Three interviews were transcribed using an AI-based transcription tool and subsequently reviewed and revised by the first author. The remaining five interviews, which were conducted in the Swiss German dialect, as well as the interview with two participants, were transcribed manually by the first author because of their greater complexity. To ensure the privacy and confidentiality of the participants' data, sensitive pieces of information such as names, locations, and calendar dates were pseudonymized (36, 37).

Data analysis

Data analysis was performed using the eight steps of qualitative content analysis according to Schreier (38). An overview of the individual steps is presented in Table 2.

Table 2
The eight steps of qualitative content analysis according to Schreier

Steps	Method
Step 1	Formulation of the research question
Step 2	Conducting the interviews
Step 3	Developing a deductive–inductive coding guide
Step 4	Classifying interview transcripts according to coding units in MAXQDA
Step 5	Testing the coding guide
Step 6	Evaluating and refining the coding guide, then reviewing all interview transcripts again.
Step 7	Within- and cross-case analysis according to Yin (27)
Step 8	Interpretation and presentation of results

The main categories and their subcategories were developed deductively on the basis of the interview guide and the concept mapping of the ERIC strategies (31) and the CFIR (32). These deductive categories were selected for their relevance to the research questions. The category system was then expanded with inductively derived subcategories that emerged from the empirical material. A detailed overview of the full category structure is provided in the Supplementary Material. The data analysis was

carried out iteratively by the first author and discussed regularly with the two co-authors as well as through peer debriefings.

Quality criteria

To ensure the trustworthiness of the study, the quality criteria proposed by Lincoln and Guba (39) were considered. Dependability was supported by maintaining analytic memos and keeping a research diary to document analytical decisions and ensure traceability. Credibility was enhanced through regular peer debriefings with the co-authors and other peers. Transferability was facilitated by providing detailed descriptions of the study context, sample characteristics and analytical procedures. Confirmability was strengthened through continuous reflextion and the systematic documentation of the research process. In addition, measures were implemented to ensure internal and external validity, as defined by Yin (27). Internal validity was ensured by systematically searching for patterns during the analysis process, while external validity was supported through the application of concept mapping derived from the ERIC strategies (30) and the CFIR framework (31). QDA software, specifically MAXQDA, was also used to ensure external validity (40). Reporting followed the Consolidated Criteria for Reporting Qualitative Research (COREQ) checklist (41).

Results

Across all the cases, four main categories emerged that capture key strategies and the facilitating and hindering factors influencing the sustainable implementation of delirium management. The following section provides an overview of the key findings, followed by a detailed presentation of strategies for sustainable delirium management and the facilitating and hindering factors within the four main categories.

Overview of the main results

An overview of the main results of the analysis is provided in Fig. 1. It presents the main categories with the identified key strategies (S) for the sustainable implementation of delirium management, as well as the key facilitating (F) and hindering (H) factors for implementation. Reciprocal relationships existed both within the categories and between the strategies and influencing factors, which meant that the two levels could not always be clearly separated. The subcategories are shown *in italics* below.

Strategies for sustainable delirium management

Strategies for implementing sustainable delirium management in the respective cases could be identified for all four main categories. Table 3 provides an overview of these strategies, both within cases (within-case analysis) and across cases (cross-case analysis), according to the four main categories. The strategies are described in detail in the following sections.

Supporting clinicians

Supporting clinicians is a key strategy for sustainable delirium management across all institutions. All cases involve structured *interprofessional collaboration*. In case 3, an interprofessional delirium working group was established during the development of the delirium guidelines, and this group continues to operate as an active and sustained implementation structure:

"And since then, we've actually had more of a working group, [...] which meets once or twice a year." (Institution 3, physician interview participant, pos. 18)

Cases 1 and 4 are characterized by a multiplier system involving regular exchanges; in case 1, these exchanges focus specifically on delirium. Several interview participants reported engaging in networking with other institutions or experts, both for the development of delirium guidelines and for the exchange of ideas. In cases 1 and 2, the institutions also participate in broader organizational structures or initiatives. Across all cases, professional support is provided by designated nursing roles, supplemented in some cases by physicians. Interviewees from multiple cases noted that employees receive support in adopting a person-centred approach to caring for patients with delirium:

"And it is really important to me that our actions always focus on the patients." (Institution 1, nursing interview participant, pos. 178)

The institutions in all four cases offer *training* on delirium, with notable variations in its structure. Two cases focus on mandatory continuing education for physicians in training, whereas the other two cases provide training on a voluntary basis. In half of the cases, e-learning modules on delirium have been developed or are currently under development. In case 3, these modules form an integral component of the onboarding process for new nursing staff:

"Part one is actually basic knowledge, where delirium is really explained [...] in this e-learning, the delirium concept is depicted." (Institution 3, nursing interview participant, pos. 49)

To support staff in everyday practice, two of the institutions have created pocket cards containing information on delirium screening and/or pharmacological therapy. Two institutions use “One Minute Wonder” posters to deliver concise learning prompts. The *communication channels* within the institutions are intentionally designed to have low thresholds. In case 2, consultation requests to the dementia/delirium nursing team are submitted digitally via the hospital information system.

Best Practice Concepts and Guidelines

The strategies used in the cases, such as written delirium management guidelines, delirium screening, orientation aids, the involvement of relatives, or the use of specific roles, were summarized under the main category "Implemented delirium management" and identified as a central strategy for ensuring sustainable delirium management.

Three of the four institutions have written *delirium management guidelines/concepts* that were developed on a scientific basis through literature research and interprofessional collaboration. In case 4, by contrast, the institution has three distinct delirium guidelines that differ according to medical specialty:

"[...] Surgery and medicine. And they have [...] two different concepts because we have two professors in the two departments [...] and accordingly, they are fundamentally convinced of a slightly different [...] delirium therapy. [...], there are no major differences, [...]. And they still have their own concept (.) in the intensive care unit, exactly. (.) Because it's simply a completely different setting, also in terms of medication." (Institution 4, nursing interview participant, pos. 42)

In all four cases, various *components* are integrated into the management of delirium. Delirium screening is implemented in all cases, although the instruments used and the professionals conducting the screening differ. In all cases, orientation aids are established to support patients with delirium in orienting themselves. In cases 1 and 2, the interviewed nurses reported using special boxes containing sensory aids in the perioperative area. In addition, the involvement of relatives constitutes an important strategy for delirium management in all cases:

"[...] what is very, very important to us is that we then contact the relatives. We usually do this together with the patient when they are sufficiently awake." (Institution 2, physician interview participant, pos. 32)

Case debriefings are held in cases 3 and 4. Cases 1 and 2 participate in “World Delirium Day” to raise awareness of the issue. The *allocation of specific roles* varies across institutions. In cases 2 and 4, physicians assume strategic responsibility, and in almost all the cases, the interviewed physicians serve in a consultative role. In cases 1 and 2, specialized nursing teams for dementia and delirium are involved, whereas in cases 3 and 4, nursing experts provide additional expertise in this area. In addition, case 3 includes an APN specializing in delirium:

"And for that, on the one hand, there are the nursing experts in the departments, who then also take a closer look at the situations; in surgery, (person) is working as a delirium nurse." (Institution 3, nursing interview participant, pos. 135)

Available resources

A key strategy for the sustainable implementation of delirium management is the availability of adequate resources across institutions.

The *staff resources* required to support delirium management vary between cases. One nurse emphasized that staffing ratios differ within the institution depending on the clinical area. *Time resources* also differ. In case 1, approximately one hour is allocated per consultation, whereas in case 4, no formal time limits are defined:

"[...] I sometimes spend four hours in the department, [...], there are really no limits." (Institution 4, nursing interviewee, pos. 76)

With regard to *financial resources*, one participant noted that designated financial resources were made available after the project application.

Evaluative and iterative strategies

In addition, effective evaluative and iterative strategies play crucial roles in ensuring the sustainable management of delirium.

In terms of *strategic planning*, all four institutions have implemented delirium management for at least eight years and regard it as an established component of their care practices. Several interview participants reported that the development and implementation of these concepts lasted several years:

"Delirium management was officially launched in 2016. [...], but the preparations in terms of content took even longer. I would say four years." (Institution 1, physician interview participant, pos. 14)

The *further development of strategies* is an ongoing process in all four cases. In cases 3 and 4, delirium guidelines are regularly reviewed and adapted as needed. The remaining two institutions are planning or have already undertaken a conceptual expansion of delirium management into additional clinical areas.

Facilitating and hindering factors

Across all four main categories, case-specific factors were identified that either facilitated or hindered the sustainable implementation of delirium management. The analytical classification was conducted using the same categories applied to the strategies for sustainable delirium management. Table 4 provides an overview of the influencing factors for each case (within-case analysis) and a comparison across cases (cross-case analysis) according to the four main categories. The categories are also described in detail in the following chapters.

Supporting clinicians

Across all the institutions, effective *interprofessional collaboration*, networking and exchange, as well as support from management, were identified as key factors that facilitate clinical practice. Conversely, limited acceptance of specialized nursing roles, work overload, exhaustion, and knowledge deficits related to delirium were described as key factors hindering the sustainable implementation of delirium management.

Almost all the interview participants highlighted effective *interprofessional collaboration* as an important factor for success. Participants in cases 1 and 2 reported close communication and support from management. The physician interviewed in case 1 emphasized the need to involve team members at all relevant levels:

"In nursing management, there are connections to higher levels, where I think it is important at all levels (...) to have connections [...]." (Institution 1, physician interview participant, pos. 68)

The nursing professional interviewed in the same case reported that bedside nurses perceive the targeted support provided by the specialized nursing team as beneficial. Exchange with other institutions or experts in the field of delirium was also consistently described as enriching. At the same time, several barriers to interprofessional collaboration were identified. Nurses interviewed in cases 1 and 2 reported initial mistrust and a lack of acceptance of their specialized roles:

"[...] I had the feeling that we weren't taken very seriously at the beginning. [...] because the work we do isn't very visible to our colleagues on the wards." (Institution 2, nursing interview participant, pos. 50)

In case 3, the interviewed nurses noted that tensions had arisen between the professional groups during the development of the delirium guidelines and that scheduling a meeting for the delirium working group had been challenging. Nurses interviewed in cases 3 and 4 also described episodes of work overload and exhaustion, particularly among nursing staff caring for patients with delirium. The physician interviewed in case 4 further highlighted the lack of experience and competence of some employees in managing patients with delirium:

"[...] the knowledge and experience of the staff is often not that high. And you can tell, yes." (Institution 4, physician interview participant, pos. 72)

With regard to *training*, it was positively noted that in both cases 1 and 2, an interprofessional target group was selected, reflecting the recognition that delirium constitutes a cross-professional concern. Nerveless, challenges remain in engaging certain professional groups. In case 1, involving the physicians in the training proved particularly difficult, whereas in case 2, the effort to adequately address all professional groups was described as equally challenging:

"We provide training for students (...) because we have noticed that (...) surprisingly, there is still (...) a very large deficit [...] among our nursing colleagues, [...] but also among the medical staff, [...] and we are well aware that this is still an issue among our colleagues that is not taken very seriously." (Institution 2, nursing interview participant, pos. 46)

An interviewed nurse in case 3 reported that some employees are reluctant to engage in the e-learning modules because of the additional workload. She further noted that a recent change in the clinical information system initially made it difficult to integrate delirium-related content.

Best Practice Concepts and Guidelines

With respect to the implemented delirium management, the presence of practical delirium guidelines and the establishment of designated roles across institutions serve as key facilitating factors, whereas structural barriers function as key hindering factors for the integration of sustainable delirium management practice.

Several interview participants reported that the digital accessibility and routine practicability of *delirium guidelines/concepts* are perceived as supportive of long-term implementation. For example, in cases 1

and 4, the guidelines are accessible via the institutional intranet, and in cases 3 and 4, they are formulated pragmatically and are well integrated into the daily clinical workflow. At the same time, structural barriers were cited among the obstacles. In case 1, reaching a consensus on the guidelines required several years, and in case 4, the coexistence of three different delirium guidelines presents additional challenges. Furthermore, a nurse interviewed in case 3 reported that implementing uniform guidelines across clinical settings is difficult:

"The difference between surgical and medical wards is huge, and then there's the emergency [...]. So it was difficult to find something that really suited everyone." (Institution 3, nursing interview participant, pos. 39)

The frequent transfers of patients with delirium within the institution were identified as a hindrance by a nurse interviewed in case 3. Across cases, participants agreed that the *allocation* of *specific roles* within delirium management represents a key factor for successful implementation. In cases 1 and 2, the nurses interviewed positively emphasized that these designated specialists are able to focus exclusively on their assigned responsibilities, thereby enhancing the quality of delirium management. Furthermore, one physician emphasized that her growing expertise in the field of delirium had strengthened her confidence in clinical decision-making in this regard:

"[...] and by expanding my skills (.), I find [...], that I feel less powerless, that I know why I recommend something and why I don't recommend something." (Institution 1, physician interview participant, pos. 82)

Available resources

Time and staff shortages proved to be key obstacles to sustainable delirium management across all institutions.

Most interview participants reported insufficient *personnel* and/or *time resources*, particularly in relation to the high number of consultation requests for patients with delirium. The nurse interviewed in case 1 described how this issue had been raised with the nursing management:

"And that's often a problem with these time resources. But I keep bringing it up, and that's why we now have the opportunity to get someone else on board. Because the nursing management is also aware of this and is very *supportive." (Institution 1, nursing interview participant, pos. 96)*

In cases 2 and 3, the interviewed nurses reported that staff turnover makes it difficult to maintain continuity in sustainable delirium management.

Evaluative and iterative strategies

Long-term planning and ongoing development were identified as key factors promoting sustainable delirium management.

The interviewees in case 1 reported that involvement in a supraregional initiative to promote awareness of dementia and delirium supported *strategic planning* efforts. The physician interviewed in case 2

emphasized that the *further development of strategies* was supported by the adoption and targeted adaptation of proven structures:

"[...] I found structures that had been created (.) and worked very well, and I simply adopted and further developed them." (Institution 2, physician interview participant, pos. 14)

Discussion

This study explores strategies as well as facilitating and hindering factors that shape the sustainable implementation of delirium management in four hospitals in the DACH region. The aim was to develop a deeper understanding of the conditions that support the long-term integration of delirium management practice and to identify key strategic approaches and influencing factors. The results illustrate that sustainable delirium management is based on several complementary strategies as well as facilitating and hindering factors.

Strategies for sustainable delirium management

Across cases, interprofessional collaboration emerged as a key strategy supporting the sustainable integration of delirium management practices. However, its specific form varied across the cases, indicating context-specific forms of implementation with overarching relevance. These findings are consistent with those of Moser et al. (42), who identified interprofessional collaboration as a prerequisite for effective delirium management, characterizing and describing it in their model as an interplay of mutual respect, continuous exchange, and the joint resolution of emerging challenges (42). The statements of the nursing participants in this study particularly emphasized the importance of a person-centred approach in caring for patients with delirium. These results are in line with the findings of Yevchak et al. (43), who showed in their study that tailored cognitive stimulation measures and knowledge of the interests and values of patients with delirium support person-centred delirium management (43).

The cross-institutional integration of training courses and innovative learning formats identified in this study as a strategy for sustainable delirium management indicates that knowledge transfer is actively promoted to support staff in delirium management. A review by Bianchi et al. (44) also recommends the implementation of comprehensive and interprofessionally oriented training materials on delirium (24, 45). Furthermore, the ERIC model identified targeted educational offerings, adequate training materials, and the training of multipliers as effective implementation strategies to empower clinicians in everyday clinical practice (30).

Schimböck et al. (12) reported that 77% of the wards examined in the DACH region have delirium management guidelines. This finding is reflected in the present study, as three of the four cases examined have implemented delirium guidelines as a strategy for sustainable delirium management. Moreover, the present study provides insights into the development and application of these guidelines and highlights the translation of scientific evidence into practice.

The use of various delirium management components, such as delirium screening, orientation aids, and family involvement, across all the examined cases indicates that professionals have recognized the importance of multicomponent intervention strategies for delirium prevention and treatment. The effectiveness of such a multicomponent approach has also been confirmed by a meta-analysis, which revealed that HELP significantly reduced the incidence of delirium, tended to shorten hospital stays, and reduced the rate of institutionalization post-hospitalization (24).

The availability of specialized roles in delirium management across all the cases examined indicates that these institutions have recognized the importance of professional expertise in delirium management and implemented this specialization in everyday clinical practice. This finding also corresponds to the findings of Weber et al. (46), who demonstrated the beneficial effects of an APN-led delirium consultation service on delirium severity and length of hospital stay. In contrast, this effect was not observed in geriatric consultations by nursing staff in another study (47).

In all the cases in this study, the development of concepts over several years and the continuous refinement of existing measures emerged as a strategy for the sustainable implementation of delirium management. These findings illustrate that sustainable implementation requires a structured and process-oriented development approach. According to ERIC strategies, such approach and planning processes can be supported through the assessment and analysis of local needs, the collection of relevant data, and the systematic review of implementation strategies (30).

Factors facilitating and hindering sustainable delirium management

Across cases, the statements of the interviewed nursing participants indicated that interprofessional collaboration can be a supportive and a facilitating factor or a hindering factor. As a hindering factor, interprofessional collaboration is associated with several challenges, such as initial mistrust and limited acceptance of specialized nursing roles. These findings align with those of another study that identified resistance to specialized nursing roles by both the medical and nursing professions as a hindering factor (48). Schimböck et al. (12) reported insufficient cited barriers to implementing evidence-based interventions in delirium care. A US expert panel emphasized that successful interprofessional collaboration is based on mutual respect, expressed through recognition of profession-specific differences and the integration of respective expertise into patient care (49). The Swiss Academy of Medical Sciences identified a lack of mutual understanding as one possible reason why interprofessional collaboration had failed (50).

In contrast, the interviewed nurses and physicians described internal and external exchanges with delirium experts or other institutions as conducive to sustainable delirium management. This result is supported by the findings of Wübbeler et al. (25), who reported that network collaboration promotes reflection on existing concepts and can facilitate the development of new delirium measures.

Another finding of this study is the repeatedly described beneficial effect of support from management. Interviewed participants also noted that regular exchange with management is crucial for the sustainable implementation of delirium management. This finding is consistent with the results of Hshieh et al. (24).

Several interview participants mentioned work overload and fatigue, especially among nursing staff, as well as knowledge deficits regarding delirium across different professional groups. These observations are consistent with the results of other studies, which have shown that nursing staff may sometimes have insufficient knowledge of delirium (12, 51, 52). Such deficits can lead to inadequate recognition or neglected treatment of delirium (52).

Several studies have shown that the implementation of delirium guidelines can reduce delirium rates, associated symptoms, and the overall costs of inpatient care (53–56). However, in most of the cases examined in the present study, structural barriers to the implementation of delirium guidelines became apparent, including parallel guidelines, lengthy coordination processes, and a lack of comprehensive validity of individual guidelines. These findings indicate that the existence of delirium guidelines does not automatically ensure their effectiveness in a clinical setting. However, high awareness and regular use of these guidelines appear to promote the sustainable implementation of delirium management. Consistent with these findings, Bush et al. (57) identified time resources and management support as key factors for the successful implementation of delirium guidelines.

Although resources were available, time and staff shortages in all the cases studied posed a challenge to maintaining continuity in delirium management. These results align with the findings of Schimböck et al. (12), who identified staff shortages as the most frequently cited barrier to implementing evidence-based interventions in delirium care. In addition, another study revealed that the funding of delirium initiatives was perceived as an additional obstacle because of the personnel costs involved (25).

Implications for practice and research

The results of this study show that sustainable delirium management cannot be achieved through individual measures alone but requires the interplay of various complementary strategies and influencing factors. Delirium management should therefore be established as a permanent structural and cultural component of interprofessional clinical care processes. To promote interprofessional collaboration in delirium management within hospitals, supportive framework conditions such as dedicated working groups and regular interprofessional exchange formats are essential. Delirium guidelines should be well known and firmly embedded in everyday clinical practice, which requires digital accessibility, regular updates, and targeted communication strategies. The results of this study also indicate that specialized nursing and medical roles in delirium management can support sustainable implementation through their professional expertise and continuous clinical presence. Such roles should be further strengthened and systematically integrated into delirium management in hospitals in German-speaking countries.

Further studies are needed to validate the findings in larger samples and to examine the effectiveness of individual strategies and influencing factors in a more differentiated manner. Future research should also investigate the influence of national health care systems, legal frameworks, and (supra)regional initiatives on the sustainability of delirium management.

Strengths and limitations

The holistic multiple case study design chosen for this study has enabled a deeper understanding of the strategies and the factors that promote and hinder sustainable delirium management in acute care settings. The study addresses a research gap, as only limited empirical research has examined the relevant strategies and influencing factors in the DACH region to date (12, 25). The inclusion of nursing and medical participants provides a differentiated, interprofessional perspective on the research questions and helps ensure that the quality criteria of authenticity and transferability are met (39).

Nevertheless, the transferability of the results remains limited because of the small sample size (39). The use of models (30, 31) to develop the interview guide and to guide deductive category development strengthens the external validity (27). However, the decision to omit an in-depth theoretical reference in the presentation of results and discussion in favour of a context-oriented presentation of the cases constitutes a limitation in this regard. The first author is training to become an APN in the field of delirium, which, according to the Zurich Cantonal Ethics Commission, represents a potential conflict of interest, as an unconscious bias in the interpretation of the results cannot be ruled out (58). One of the cases examined was also the first author's place of work. Although there were no direct points of contact with the nursing or medical professionals interviewed, the possibility that the analysis was influenced by the first author's subjective perspective cannot be ruled out (41). These potential biases were critically reflected on during peer debriefings to enhance credibility (39).

Conclusion

The results of this study offer hospitals in German-speaking countries practical guidance for the sustainable implementation of delirium management. They show that such implementation relies on the interplay of multiple complementary strategies and influencing factors. The results further underscore the need to establish delirium management in acute care as a long-term strategic priority supported by adequate resources. In the cases examined, sustainability was achieved by structurally embedding delirium management, fostering interprofessional collaboration, and continuously refining existing delirium management components and related measures. Alongside standardized delirium management guidelines and assessment tools, specialized nursing and medical roles and practice-oriented training concepts contributed to sustainable implementation. Successful interprofessional collaboration and managerial support emerged as particularly important facilitating factors. At the same time, challenges such as limited time and staffing resources, workload- and competence-related barriers, and structural constraints hindered sustainable implementation. These aspects should be explicitly addressed when new delirium management guidelines or approaches are being implemented in acute care settings.

Abbreviations

APN Advanced Practice Nurse

A Austria

BSP Bedside nursing professional

BP Best Practice

CFIR Consolidated Framework for Implementation Research

CH Switzerland

COREQ Consolidated criteria for reporting qualitative research

D Germany

DACH region Germany, Austria, Switzerland

DM Delirium management

ERIC Expert Recommendations for Implementing Change

HELP Hospital Elder Life Program

IC Interprofessional collaboration

ICD-11 International Classification of Diseases^{11th}Revision

M Male

F Female

Declarations

Ethical approval and consent to participate

The study was conducted in accordance with the Declaration of Helsinki (59) and the ICH-GCP Guidelines for Good Clinical Practice (60). This study is not subject to the Swiss Human Research Act and has been authorised by the Zurich University of Applied Sciences (ZHAW) Ethics Review Board (EA-ZHAW-2024-STA-016-G, date: August 5, 2024). Participation in the study was voluntary. The study participants were informed about the aim of the study by the first author and signed a consent form before the interview. Participants had the opportunity to withdraw their consent to participate in the study at any time. The anonymity of the participants and the confidentiality of the data generated were guaranteed throughout the entire study.

Consent for publication

All participants signed a consent form allowing the use of their fully pseudo-anonymized data for this study. The consent forms are available to the research team.

Competing interests

There are no conflicts of interest on the part of the authors of this study.

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Author Contribution

SB was responsible for the design, data collection, data analysis and interpretation, as well as writing the original draft and revising the manuscript. MS and TQ were responsible for the design, supervision, and support in preparing the manuscript. BN was responsible for the supervision and support in preparing the manuscript. All authors approved this manuscript for publication and assume responsibility for all aspects of the work.

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Availability of data and materials

The audio files, consent forms, and interview transcripts were archived in a specially secured folder to which only selected members of the research team have access.

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Tables

Table 3 and 4 available in the Supplementary Files section.

Figures

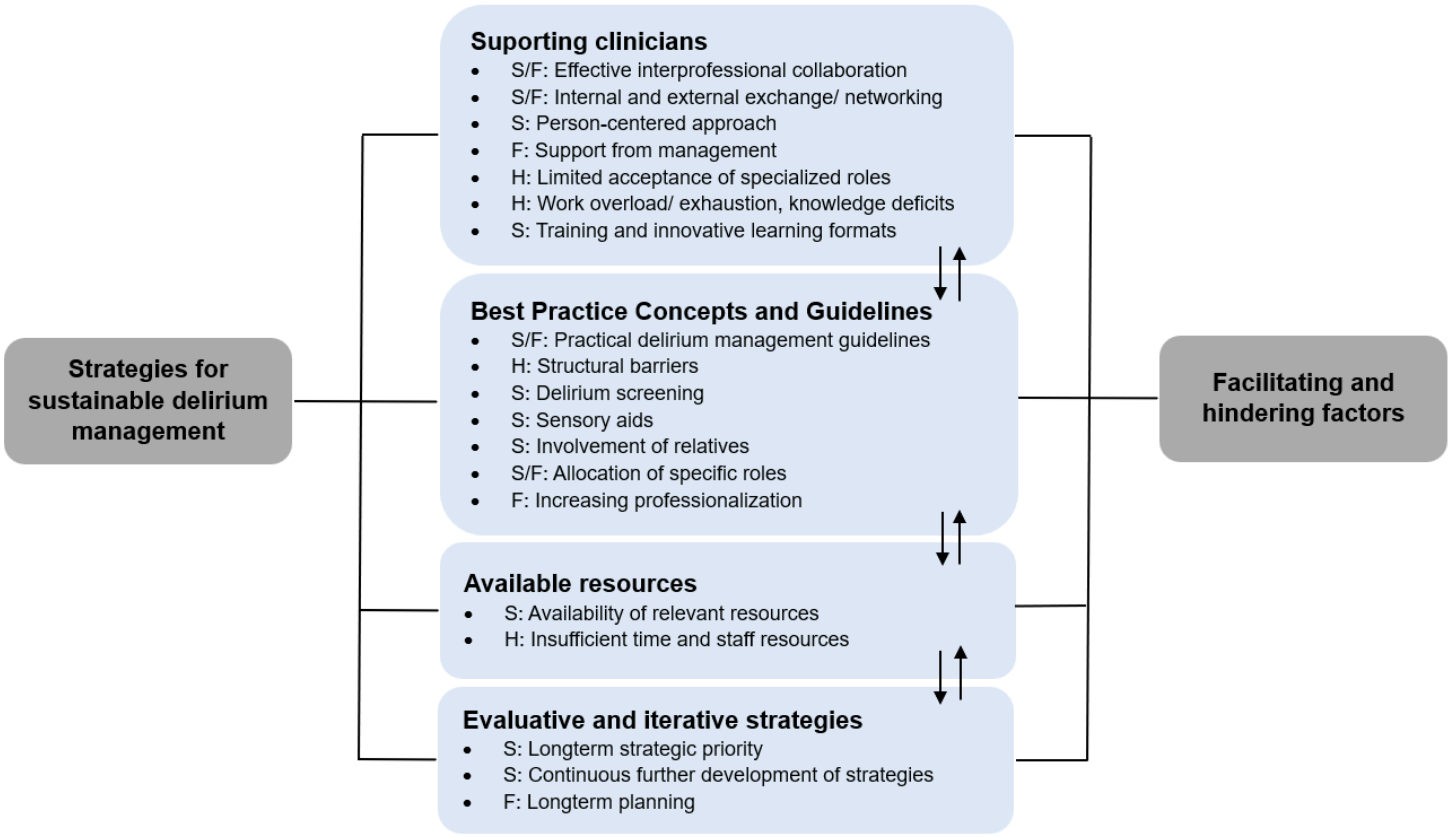


Figure 1

Main results of the analysis

Legend: S, strategies; F, facilitating factors; H, hindering factors

Supplementary Files

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- Tables3and4.docx
- COREQChecklist.docx