Improving guideline-based care for suicide prevention in mental healthcare: an empirical implementation protocol

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Global Implementation Research and Applications
https://doi.org/10.1007/s43477-025-00202-5

Improving Guideline-Based Care for Suicide Prevention in Mental Healthcare: An Empirical Implementation Protocol

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Received: 6 December 2024 / Accepted: 9 December 2025

Abstract

While guideline-based mental healthcare has demonstrated its potential to enhance patient outcomes and reduce suicide rates, low adherence to these guidelines in mental healthcare settings remains a significant challenge. Clinical guidelines for suicide prevention have existed in the Netherlands for over a decade, yet variability in guideline adherence persists. Using a Systematic Approach to Suicide Prevention in mental healthcare based on implementation science, this study aims to enhance the uptake of guideline-based care for suicide prevention in mental healthcare settings. Aligned with the knowledge-to-action (KTA) framework, this study design incorporates the Consolidated Framework for Implementation Research (CFIR) and the Reach, Effectiveness, Adoption, Implementation, Maintenance (RE-AIM) model to create a robust approach for improving the adoption of guideline-based care for suicide prevention. Each phase of the KTA framework is outlined in the study protocol, offering a structured roadmap for implementing and evaluating the program. The inclusion of CFIR allows for a nuanced exploration of contextual factors influencing implementation, while the RE-AIM model facilitates a thorough evaluation of the project across multiple dimensions. The study takes a mixed-methods approach to collecting data on patient level, professional level, and implementation level outcomes. This research represents a step towards bridging the gap between guideline development and practical application in mental healthcare, striving to make a meaningful impact on suicide prevention efforts. The integration of comprehensive implementation science frameworks provides a systematic and evidence-based foundation for fostering sustainable improvements in guideline adherence, ultimately contributing to a more effective and responsive mental healthcare system.

Keywords Mental health care · Suicide · Clinical guidelines · Guideline implementation · Suicide prevention · Mixed-methods research

In the Netherlands, suicide rates (around 10.5 per 100.000 citizens) have been relatively stable for the last decade (Statistics Netherlands, 2021, 2023). Approximately 40% of the people who die by suicide were registered within the mental healthcare system (Huisman et al., 2009; Volksgezondheid, 2022a)) and many more patients attempt suicide. Aiming to reduce suicide rates and improve quality of care for patients with suicidal thoughts and behaviours, the Dutch multidisciplinary guideline for diagnosis and treatment of suicidal behaviour was developed in 2012 (Van Hemert et al., 2012). The implementation of this guideline has received considerable attention since then. While some improvements have been noted (Mokkenstorm et al., 2018), there is still a considerable degree of practice variation in the mental health care for patients at risk of suicide (Setkowski et al., 2020), and individual implementation strategies such as a single training have proved unsuccessful (Beurs et al., 2016). Based on research from the UK, a cumulation of more service improvements lead to a larger decrease in suicide rates in clinical populations (Kapur et al., 2016; While et al., 2012). Therefore, a multi-faceted implementation of the guideline may be more successful in improving guideline-based care for suicide prevention. Moreover, grounding this research within implementation science frameworks allows

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Published online: 22 December 2025

for a stronger base for implementation, both theoretical and practical. In this article, we present the rationale for a large-scale implementation study on improving the uptake of guideline-based care for suicide prevention in mental healthcare institutions, the implementation frameworks that have shaped the study's structure, and the outlines of the research design.

Background

Enhancing the implementation of guidelines has a strong base in the literature across healthcare domains, and the positive influence of guideline-based mental healthcare has been demonstrated internationally (Girlanda et al., 2017; Setkowski et al., 2021). In the Netherlands, there was a high degree of practice variation in the provided mental health care for patients after a suicide attempt before the publication of the guideline (Verwey et al., 2007). Many mental healthcare institutions (MHI) lacked adequate suicide prevention strategies. Since publication of the guideline, several implementation efforts have been undertaken to improve the uptake of guideline-based care on suicidality. One project employed an educational outreach approach to improve the quality of their suicide prevention strategies (Mokkenstorm et al., 2018). They found improvements on four out of ten domains: the development of organisational suicide prevention policies, monitoring of suicides, evaluations after suicides and clinician training. However, the other six domains did not improve, and there was significant practice variation between MHIs. A second project employed a training module aimed at professionals in psychiatric departments. However, they found no improvements on suicidal ideation for the overall group of suicidal patients, and small effects for a subgroup with comorbid depression (De Beurs et al., 2015; Beurs et al., 2016). A third project, a network between sixteen large MHIs who all collaborated on reducing suicides (SUPRANET Care, see Setkowski et al., 2018) led to MHIs better reporting on suicide attempts and more knowledge about suicide and slightly better guideline adherence among professionals (Setkowski, 2023). However, results were still far from optimal, and from a survey in a subsample from this project large differences between and within MHIs with regard to guideline adherence were found (Setkowski et al., 2020).

Barriers to implementation exist at the patient, professional, organisational, and societal level. Effective implementation programmes therefore need to address many of these barriers all at once. Reviews of implementation studies in healthcare have identified commonly reported barriers, such as a lack of time and resources, a lack of knowledge, low motivation to change, and negative attitudes towards the intervention (Correa et al., 2020; Wakida et al., 2018). Common facilitators also exist, such as consistent leadership and the application of technology (Correa et al., 2020). Some barriers and facilitators may be context-specific to a country or even to an individual MHI, thereby enforcing the need for tailored strategies.

The Current Study

Guideline implementation is notoriously difficult (Grol & Grimshaw, 2003). Compared to guidelines for specific illnesses, guidelines for suicide prevention and self-harm could likely be more complex to implement because they are transdiagnostic features that need an integral implementation across all departments. The Dutch guideline for suicidal behaviour consists of four parts, of which this project focuses on implementing three of them. These are: general principles in dealing with suicidality, the diagnostic process, and treatment. General principles include aspects such as assuring continuity of care and involving next-of-kin throughout the process. The fourth part deals in what to do after a suicide has occurred, and is therefore not a focus of the current study, which focuses on the patient journey. For this implementation study, we reached out to the SUPRANET Care network of MHIs, which has continued as a unique foundation after the research programme ended. From this network, five MHIs took the additional step to engage in a more profound and guided collaboration toward better guideline implementation. We will follow these five large MHIs, in which multiple types of care are represented (e.g. inpatient care, long-term residential care, intensive outpatient care) for a period of two years, guiding and monitoring their implementation of the guideline while facilitating between-institution collaboration. These independent institutions are taking on a pioneering role together in the field of suicide prevention, allowing other MHIs in the country to learn by example.

While all implementation studies aim to reduce the research-practice gap, guideline implementation has a unique position in this field, due to the guideline itself being a document created to summarise research and put this knowledge into practice. Knowledge translation (KT) is therefore an integral process to improve guideline-based care. Selecting a theoretical framework or model for implementation can be helpful in facilitating KT and may increase the likelihood of successful implementation (Davies et al., 2010; Rycroft-Malone & Bucknall, 2010). The following section describes the selection process of a theoretical framework for the current study and how this was used to inform the design process.

Implementation Research

Selecting a Theoretical Framework

We studied the various categories of implementation frameworks created by Nilsen (2015) to determine what type of implementation framework would be most suitable. There is a plethora of different frameworks, each designed for specific purposes and this can leave researchers struggling to select an appropriate framework for their implementation project (Strifler et al., 2018). Once a framework has been selected, there is marked variation on how this framework is used, with many studies simply referencing the model without describing how it influenced the study (Field et al., 2014). A survey among 223 implementation researchers suggested that theory selection is often haphazard and driven by simple processes, such as prior exposure to a model, rather than sophisticated selection criteria (Birken et al., 2017). Ultimately, we chose the process model 'knowledge-to-action' (KTA) framework (Graham et al., 2006; Graham & Tetroe, 2010). A process model describes and guides the process of translating knowledge into practice, which we believe is well suited for guideline implementation research. These models offer practical guidance for KT and outline steps to be taken in the implementation process (Nilsen, 2015). The KTA framework consists of two processes: the knowledge creation process and the action cycle (Graham et al., 2006). In our situation, the guideline creation would fall under the knowledge inquiry and synthesis, and the main focus for our implementation project will be on the action cycle. The action cycle consists of seven phases which interact with each other and do not follow a linear trajectory (see Fig. 1).

Some phases in the KTA framework overlap with other theoretical approaches to implementation science, and allow for integration with other frameworks to expand on phases as needed. The assessment of barriers and facilitators to knowledge use can be very well complemented by a determinant framework (Nilsen, 2015). In this study, the Consolidated Framework for Implementation Research (CFIR) will be used to study the barriers and facilitators (Damschroder et al., 2009, 2022). The CFIR is composed of five domains: intervention characteristics, outer setting, inner setting, characteristics of the individuals involved, and the process of implementation. We chose the CFIR specifically as a determinant framework because it was designed with the purpose of complementing process theories (Damschroder et al., 2009). The CFIR also guides a comprehensive evaluation of the implementation, which leads to the introduction of the second framework we have added to complement the KTA framework. To evaluate the outcomes, we will use the RE-AIM (Reach, Effectiveness, Adoption, Implementation, Maintenance) model as a base (Glasgow et al., 1999). The RE-AIM model was designed with KT in mind, suggesting that an evaluation framework with a focus beyond effectiveness would be more effective in bridging the knowledge-practice gap (Glasgow et al., 2019).

The KTA Framework Applied

Figure 1 shows an adaptation of the KTA framework by Graham and colleagues (2006), supplemented with the CFIR and the RE-AIM model and where they fit into the action cycle. The sections below outline each step in the KTA framework and how this maps onto designing, implementing, and evaluating our study.

Knowledge Synthesis and Tools

The Dutch guideline for suicidal behaviour (Van Hemert et al., 2012) is at the core of the current intervention. This guideline offers a synthesis of suicide research and suggests best practices for diagnostics and treatment for suicidal clients. An updated version of this guideline is expected in 2025. In order to facilitate adoption of these guidelines into mental healthcare, we have developed a user-friendly interactive online guideline dissemination toolkit (113.nl/toolkit). The tool was designed to help healthcare professionals with screening, diagnostic interviewing, and clinical decision-making. The toolkit contains example questions, questionnaires, and a clinical decision-making tool. The decision-making tool summarises conclusions and recommendations from the guideline as well as recent scientific evidence into tailored advice with regard to treatment based on specific characteristics such as age group and diagnostic group(s). This tool has already successfully been piloted in various MHIs both within and outside of the SUPRANET Care network.

Identify Problem

As mentioned in the introduction, there is a high level of practice variation and sub-optimal guideline adherence in the Netherlands, (Setkowski, 2023; Setkowski et al., 2020). However, in research from the UK a reduction was found in the number of suicides within institutions who were more successful in implementing guideline-based care (Kapur et al., 2016; While et al., 2012). Adopting 7 or more recommendations was associated with lower suicide rates than those adopting fewer. This suggests that an integrated form of guideline-based care at all levels of an organisation is necessary to create (sustainable) change.

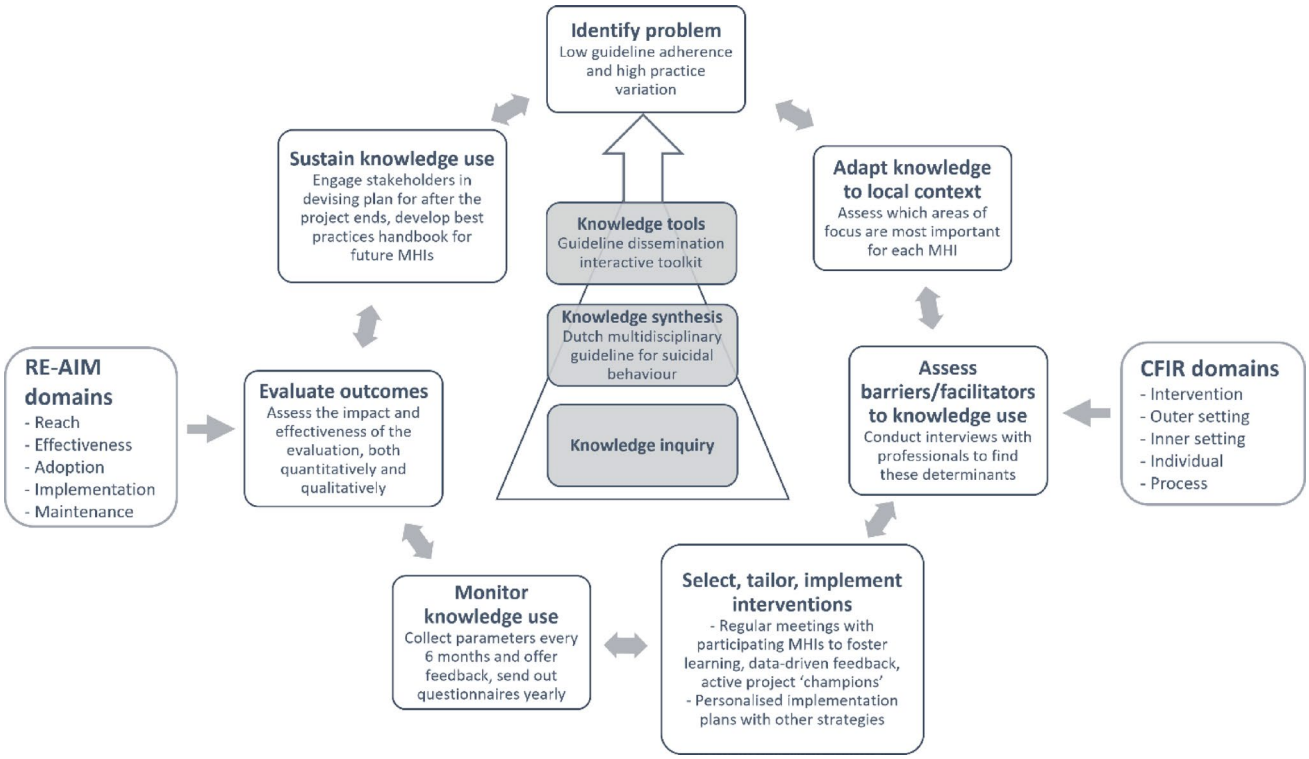

Fig. 1 Knowledge to Action Framework, Adapted from Graham et al., (2006)

Adapt Knowledge To Local Context

Most mental healthcare institutions (MHIs) already have protocols and systems in place on the topic of suicide prevention. Participating MHIs are also part of the SUPRANET Care network, through which they have developed their own suicide prevention strategies. Having learned from the previous projects to improve utilisation of the guideline, the MHIs have written comprehensive plans on their suicide prevention policies. During the current implementation project, we aim to help them execute these plans most effectively, using the knowledge about barriers and facilitators from the literature and previous efforts. Since the current state of the implementation of their suicide prevention strategies differs between MHIs, the best way to improve their uptake of guideline-based care will be tailored to their situation.

Assess Barriers/Facilitators To Knowledge Use

Assessing barriers and facilitators will happen in two stages. Before the start of the guided implementation, a team of implementation experts will support the participating MHIs in selecting and tailoring their own implementation interventions (as discussed in more detail in the next section). During this process, examples of barriers and facilitators from the literature will be used to guide them in their decision-making, along with their prior experiences of potential barriers and facilitators within their institution. Examples of common determinants in mental healthcare are: attitudes toward the guideline, (lack of) social pressure, workload, or organisational culture (Fischer et al., 2016; van Dijk et al., 2012). This will help them decide the timeliness of the changes they plan to introduce, as well as determine effective strategies to communicate and integrate these changes into daily practice.

The second stage of assessing barriers and facilitators will happen post-implementation. Here, we will use the CFIR to explore what factors influenced the implementation success as measured in the outcome evaluation (Damschroder et al., 2009, 2022). Interviews with mental healthcare professionals will be conducted to investigate their experiences with the implementation interventions and the barriers and facilitators they experienced in this regard. The interview questions will address the five domains of the CFIR (the intervention, inner and outer setting, the individuals involved, and the implementation process). Due to time constraints, it was not possible to adopt this method for the pre-implementation phase as well, which is why determinants will be taken from the known literature.

Select, Tailor, Implement Interventions

In order to promote guideline-based care in the participating MHIs, a wide range of implementation strategies will be available during the project. Some of these will be kept constant across MHIs, while some may be tailored based on the preferences within each MHI. Much is already known about effective implementation strategies, with studies suggesting that multifaceted implementation is most effective (Fischer et al., 2016; Peters et al., 2020; Prior et al., 2008). Predetermined strategies in this study include appointing active project leaders and/or 'champions' who will engage team members within an MHI. Often, these are people who are already active in the suicide prevention committees or who work in departments related to policy or quality assessment. We will host monthly meetings with the project leaders of all MHIs to monitor their progress and allow them to offer advice to each other. Moreover, we will organise trimonthly meetings with project leaders, the external project group, and occasionally directors or managers, to discuss specific topics from the guideline. data-driven feedback on implementation success, as well as regular meetings with all participating MHIs, where they can exchange their experiences and foster knowledge sharing.

In addition, we intend to offer the MHIs a 'toolbox' with implementation strategies they can apply to their own suicide prevention strategy. This toolbox is grouped into themes and includes strategies such as creating dashboards to monitor progress, setting up a committee with professionals dedicated to suicide prevention, and starting internal communication campaigns to increase awareness about the project. A full list of these themes and strategies can be found in Table 1. This is one aspect where variation across the five MHIs is visible, as some MHIs have already undertaken some of these activities on their own, whereas others are further behind. During the current project, we will record their plans for how they will use these tools in their planned changes in an implementation plan. Then, we will document how this has been executed in order to report on the implementation process and for the purpose of evaluation.

Monitor Knowledge Use

The monitoring phase contains most of the data collection for the project. Here, service- and patient-level parameters are collected every six months in order to assess whether guideline-based care improves over time. A list of all parameters that will be collected during the study can be found in Table 2. Moreover, yearly questionnaires will be sent out to mental healthcare professionals, assessing their perceived knowledge of and adherence to the guidelines. This monitoring will be used for data-driven feedback to the MHI. This approach is based on the SUPRANET Care approach (Setkowski et al., 2018), and will allow MHIs to adjust their implementation strategies based on their results throughout the project.

Evaluate Outcomes

In the evaluation phase, the RE-AIM framework will be used to assess the outcomes (Glasgow et al., 1999). Based on the length of the study, maintenance will not be part of our evaluation outcomes, as we cannot assess any sustained use beyond the implementation intervention. However, we will be assessing their intention for continued use, as mentioned below in Sustain knowledge use. An overview of how the outcomes map onto the RE-AIM domains can be found in Table 2. For example, the staff questionnaire includes explanatory variables such as years of experience, discipline and role, which we will use to evaluate whether they explain potential differences in guideline adherence and self-efficacy.

Sustain Knowledge Use

Nearing the end of the project, stakeholder meetings will be held with each of the participating MHIs to discuss their progress as well as to investigate their vision going forward after the project ends. Furthermore, accumulating all the knowledge from the current project, we aim to develop a best-practices document for the implementation of guideline-based care in mental healthcare. This document will be freely available to participating and nonparticipating MHIs, thereby allowing them to learn from our process when instigating their own implementation process.

Study Design

For this project, a project team was brought together with experts from various fields. The team consists of representatives from the national network of mental healthcare providers, a mental health advocacy organisation focusing on client's rights, a foundation focused on care for next-of-kin, a suicide prevention centre focusing on people with lived experience, the national suicide prevention centre, and a consultancy agency known for its hands-on approach to guide the implementation. Various people in this team have lived experience. The team comes together monthly to discuss the design, implementation, and evaluation of the entire project. Specific expertise and perspectives from members are called upon throughout the project when needed. The project consists of three main areas of focus, all of which are outlined below. The first focus is on the implementation

Table 1 List of potential implementation strategies

Theme	Strategy
Gaining insight Goals: – Determine a starting point – Gain information about current state of affairs – Reflect on performances	• Organise a baseline assessment to facilitate conversation • Speak with members of various teams about their experiences • Compare performances between teams or organisations
Policy and management Goals: – Develop a multi-year strategy on the topic – Achieve a shared understanding and purpose within the management layer – Involve other relevant stakeholders (e.g. a client council)	• Set up a committee dedicated to suicide prevention • Write a multi-year suicide prevention strategy or critically evaluate the current strategy • Incorporate relevant proposals on communication and training in the multi-year strategy • Put suicide prevention on the agenda at relevant stakeholder meetings
Visible leadership Goals: – Involve both formal and informal leaders – Create more support through visible actions rather than words	• Ask the board of directors to share the importance of suicide prevention publicly • Involve at least two directors and managers who are passionate about suicide prevention • Assess which professionals are passionate about suicide prevention and connect them to each other ('champions') • Discuss how these informal champions feel comfortable sharing their involvement in the project
Preconditions Goals: – Facilitate necessary tools and materials for professionals – Organise adequate training for professionals – Improve registration in electronic health records	• Make changes to the electronic health records as needed • Improve the availability of training modules for suicide prevention • Determine which training modules should be mandatory and for who • Discuss proposed changes with professionals and assess further needs
Starting an internal campaign Goals: – Increase visibility within the organisation – Selecting a fitting message that inspires professionals to change	• Involve selected professionals in determining the target group and scale of the campaign • Formulate a clear message with involved professionals who are passionate about suicide prevention • Involve employees from the communication department to address how to launch the campaign
Clarify objectives and goals Goals: – Formulate SMART goals on suicide prevention – Communicate goals within organisation	• Determine whether process based goals (e.g. percentage professionals trained) or result based goals (e.g. X% fewer suicide attempts) are preferred within the organisation • Connect informal leaders with management to formulate fitting goals together • Stimulate professionals to formulate smaller goals within teams
Working with external partners Goals: – Strengthen partnerships with other organisations – Improve patient journey	• Determine which aspects of the suicide prevention plan need coordination with external partners • Assess which external partners are crucial to an optimal workflow in the organisation (e.g. emergency departments, schools, councils) • Determine how to share information about suicide prevention in a way that patients can find their way to help • Formulate a plan with external partners when patients are involved in multiple organisations
Team-based approach Goals: – Create lasting change within teams – Offer personalised interventions to different teams – Increase awareness and involvement within teams	• Determine which teams can be targeted first • Allow teams who start to be an example to others by facilitating meetings or sharing of examples • Organise meetings within teams to discuss team-based goals and what their needs are • Develop modules that teams can use as needed (e.g. for specific treatment options) • Involve next-of-kin and people with lived experience to share their knowledge and needs with the teams • Develop a dashboard or monitoring system teams can use to track their progress • Put monitoring and sharing of experiences on the agenda in team meetings • Develop a best-practices document with protocols and suggestions based on teams who have done well
Monitoring and evaluating	• Make real-time data accessible to professionals to target the interventions more directly

Table 1 (continued)

Theme	Strategy
Goals: – Develop a clear structure for evaluating and monitoring in the organisation – Make evaluations available to a wider audience within the organisation	• Share results from evaluations organisation-wide so everyone can learn from them • Make use of dashboards to monitor progress and determine the course of action

Table 2 List of parameters to be measured during the study

Pillar	Parameter	Data Source			Associated RE-AIM questions
		Record data	Question-naires	Interviews	
Long term goals					
Suicides	Fatal suicides (number)	X			
Suicide attempts	Patients who attempt suicide (number)	X			
Guideline					*Reach*:
General principles	Involvement of next-of-kin (yes/no)	X	X		• To what extent do patient characteristics explain differences between those who did and did not receive all elements of guideline-based care[a]?
	Continuity of care (yes/no)	X	X		
Diagnostic process	Suicidality assessed at intake (yes/no)	X	X		• To what extent do staff characteristics explain differences in perceived guideline adherence?
	Diagnostic interview conducted (yes/no)	X	X		*Effectiveness*:
Diathesis-stress model	Structural diagnosis formulated (yes/no)	X	X		• Did the proportion of eligible clients receiving guideline-based care* increase over time?
First interventions	Safety plan (yes/no)	X	X		
Long term interventions	Treatment offered for suicidality (yes/no)	X	X		
Preconditions					*Adoption*:
					• How representative are the institutions taking part in the study for MHIs in the Netherlands?
					• To what extent did the organisations support their employees in participation in the program?
Stability	Staff turnover (%)	X			
	Perceived stability (scale)		X		
	Self-employed staff (%)	X			
Training	Perceived knowledge about guideline (scale)		X		*Effectiveness*:
	Self-efficacy (scale)		X		• Did perceived knowledge about the guideline among professionals increase over time?
					• Did self-efficacy among professionals increase over time?
Implementation process					*Implementation*:
Implementation success	Perceived implementation success (qualitative)			X	• Is there variation in adoption across the organisation? (i.e. to what extent did MHIs succeed in implementing the intervention across departments/teams?)
	Participation in implementation efforts (e.g. training) (yes/no)		X		• Are the implementation strategies outlined in the implementation plan delivered as intended? If not, what was changed and why?
Factors affecting implementation	Barriers to implementation (qualitative)			X	
	Facilitators to implementation (qualitative)			X	

Parameters are grouped in pillars, each associated with RE-AIM questions. Data sources where the parameter will be collected from are also noted. [a]Guideline-based care is composed of the 7 parameters listed under Guideline and will be assessed separately

of the guideline. Using a baseline assessment to determine adherence to the guideline in each MHI, tailored implementation plans will be developed. The level of implementation and the quality of care indicators will be continuously monitored throughout the project. This monitoring will then be fed back to the MHIs to help them guide the implementation process. Guided by the MHIs own needs, they may implement the guideline-based approach in a stepwise fashion, gradually scaling up to the entire institution, or a combination of organisation-level changes and team-level interventions.

The second focus is on improving knowledge and self-efficacy among healthcare professionals. Since common barriers to implementation are a lack of knowledge and self-efficacy (Fischer et al., 2016), improving these is essential in order to yield better implementation outcomes. Vice versa, more focus on the implementation of the guideline within teams may improve knowledge through this increased attention to suicide prevention. We will assess the knowledge, self-efficacy, and perceived guideline adherence of professionals at baseline, and at the end of the study. The baseline assessment will be used to give detailed feedback to the MHI on areas that may need focus during the project.

The third focus is to assess context-specific barriers and facilitators to implementation. Forty healthcare professionals from different teams across the participating MHIs (8 per MHI) will be interviewed using semi-structured interviews, assessing their experiences with the implementation process retrospectively. At least one project leader from each MHI will be interviewed since they have an overview of all conducted activities. Other professionals will be asked in collaboration with the project leader or directors to ensure a varied sample in terms of disciplines and roles. Interviewing employees from various disciplines allows us to gage to what extent the activities reached the entire organisation. The interview guide will be based on the five CFIR domains: intervention characteristics, outer setting, inner setting, characteristics of the individuals involved, and the process of implementation, following a similar method as a study on the implementation of guidelines in emergency departments in Ireland (O'Connell et al., 2024). This will inform best practices in how to implement this systematic approach to suicide prevention in the future. The results of the interviews will be combined in a mixed-method approach with the results from the guideline implementation success evaluation, whereby the implementation success on the indicators will be compared with the perceived success and its associated determinants.

Data Collection

Five large mental healthcare institutions will be recruited, who together treat an estimated 100,000 patients yearly and employ around 10,000 mental healthcare professionals. Based on the number of suicides registered in MHIs between 2019 and 2021, the five participating MHIs would account for around 15% of those suicides (Volksgezondheid, 2022b). By selecting diverse MHIs, we aim to improve the generalisability of the findings and ensure they are relevant across varying organisational contexts within the mental healthcare sector. However, this means that the five MHIs have various differences – including treatment approaches, geographical location, resource allocation, and patient demographics. Moreover, while all five MHIs are part of the SUPRANET Care network, there are differences in their progress with regard to suicide prevention policies, treatment, and training opportunities. All of these differences will be taken into account when interpreting (potential differences in) the results.

Pseudonymised quality of care parameters at the client level will be collected from Electronic Health Records every 6 months in an automated fashion, together with basic demographic features (sex, age group, primary diagnosis) that reduce the chance of data being potentially traceable to an individual client. Parameters that are more sensitive, such as (fatal) suicide attempts, will only be collected at an institutional level to prevent data from being traceable to individuals.

All healthcare professionals working with patients older than 12 within a participating MHI will be invited to complete the questionnaires. The questionnaires will be distributed via local project leaders in each institution. Participating professionals will provide informed consent electronically before the questionnaire starts. A reminder will be sent after two weeks to encourage participants to take part. For the interviews, the local project leader will be invited to take part, as well as selected professionals from various teams and disciplines, to ensure a varied sample. Interviews will be conducted online or live depending on availability..

Outcomes

Quality of Care

Our main outcome of interest is quality of care, and we have operationalised this into different measurable parameters. An overview of these parameters can be found in Table 2, with operationalisations for each parameter listed in Appendix A. The parameters reflect relevant sections from the guideline that focus on the patient journey. With these parameters we will be able to assess whether patients

received care of the quality that is recommended in the guideline. All parameters will be collected at the patient-level. This data can then be grouped within teams or a different aggregate group, depending on each individual MHI, with these groups nested within an MHI in order to compare across all MHIs.

Self-efficacy

For the questionnaires, we will be using an adapted version of a questionnaire that has previously been used to study knowledge, self-efficacy and guideline adherence for suicide prevention (Beurs et al., 2016; Setkowski et al., 2020; Terpstra et al., 2018). The questionnaire includes questions on current knowledge (e.g. "How much do you know about behaviours associated with suicidality?"), self-efficacy (e.g. "I hesitate to ask clients if they have suicidal thoughts" [reverse scored]), and perceived guideline adherence (e.g. "How likely is it that you involve next of kin when treating suicidal clients?").

Suicide Deaths and Attempts

Based on international evidence, guideline-based care should lead to a reduction in suicide attempts and suicides. However, based on previous experience within SUPRA-NET Care, it was found that registration of suicide attempts was incredibly difficult. Thence, our focus will instead be on improving the systematic registration of suicide attempts, and we expect an increase in registered attempters during the study period through increased awareness of proper reporting. We will collect these statistics every six months at the institutional level. The health inspection service requires MHIs to report any patient suicides, so this data is routinely collected and checked.

Implementation Success

Specific outcomes for implementation success following the RE-AIM dimensions have already been discussed under Evaluate outcomes in the action cycle description. This will be augmented with the interview data on the implementation process, focusing on barriers and facilitators following the CFIR domains.

Data Analysis

Guideline Implementation

Quality of care indicators will be collected at the individual level. This allows us to investigate correlations and patterns between different indicators at a descriptive level. For formal analyses, the indicators will be aggregated to percentages within a subgroup based on the structure within an MHI. A second-order latent growth model will be used to study the changes in the quality of care indicators over time (see e.g. Kohli & Harring, 2013; Sayer & Cumsille, 2001). Quality of care will be considered a higher order latent variable, with the indicators mapped onto this latent variable. This factor model approach will allow us to study which indicators influence quality of care the most at each time point, as well as to see changes in the latent construct. The approach also allows us to look at differences both between and within MHIs, using a nested structure.

Self-Efficacy

Sum scores will be computed for each of the three domains (current knowledge, self-efficacy and perceived guideline adherence). Multilevel analyses will be used to study the change in scores on the three domains over time, with scores nested within teams and organisations.

Implementation Success

If the data allows, we will conduct interrupted time series designs for specific implementation strategies within MHIs to examine how they relate to the change in the quality of care indicators. If formal analyses are not possible, we aim to provide descriptive analyses to visualise the change in the indicators over time, with the timing of the implementation strategies overlayed.

Barriers and Facilitators

A qualitative approach will be taken, following the principles for thematic analysis (Silverman, 2020). A crude list of codes will be made based on the interview topics, whereafter inductive coding will be used to identify new themes. The emerging themes will be compared with results from the guideline indicators in an attempt to explain the implementation success rates. Where possible, quantitative data will be used to add to the qualitative themes and strengthen the evidence.

Discussion

This paper presents a research design for an implementation study of guideline-based care for suicide prevention in mental healthcare institutions. We believe the strong base in the implementation science literature makes this a strong conceptual design, where we will be able to longitudinally follow five large organisations focusing on the uptake of guideline-based

care, self-efficacy of professionals, and the implementation process to use this to support other organisations trying to implement guideline-based care. This allows future researchers or implementers to use this design as a base for their own implementation projects, simply by adapting elements to their own context. It is important to note that the five participating MHIs have already made considerable efforts with regard to suicide prevention, so their improvements may be smaller than in organisation who have not yet implemented prevention strategies. However, studying these frontrunners does give ample opportunity to investigate effective implementation within large institutions on various domains of prevention. Suicide prevention works best as a multi-faceted approach targeting all three levels of prevention: universal, selective, and indicated. Our study focuses on the latter, targeting those with suicidality who are in mental healthcare. Furthermore, our focus is not only on preventing suicides, but also on improving quality of care and increasing staff knowledge and self-efficacy more broadly. Especially because the low base rate of suicides and suicide attempts combined with the short duration of the project, seeing decreases in these outcomes is challenging. Since studies show that offering guideline-based care also improves other patient outcomes (Setkowski et al., 2021), we believe that the impact of improved quality of care can benefit many more than simply those at risk of suicide. Lastly, with a focus on assessing determining factors for implementation success, this study adds valuable knowledge for successful implementation processes in mental healthcare.

Supplementary Information The online version contains supplementary material available at https://doi.org/10.1007/s43477-025-00202-5.

Acknowledgements We want to thank the SUPRANET Care institutions for paving the way for this follow-up project and for their enthusiasm when it comes to implementing better suicide prevention policies.

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Funding This study was funded by the Ministry of Health, Welfare and Sport. The funder has no role in the design or execution of the current study.

Data Availability No datasets were generated or analysed during the current study.

Declarations

Competing Interests The authors declare no competing interests.

Ethics Approval and Consent To Participate This study has been approved by the Medical Ethics Review Committee of Amsterdam University Medical Centers [2023.0821].

Consent for Publication All authors have agreed to publication of the manuscript.

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