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Knowledge, confidence, guideline adherence and improvement needs regarding suicide prevention in acute care: a cross-sectional study in hospitals in the Netherlands

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Abstract

Background Emergency departments (ED) and intensive care units (ICU) in general hospitals can contribute to preventive care for patients with suicidality. Despite the availability of guidelines worldwide, challenges remain in providing such care. In the Netherlands, it is unclear to what extent suicide prevention is implemented in acute hospital care.

Methods Cross-sectional survey among ED and ICU professionals in 18 hospitals between 2020 and 2022. Primary outcomes were self-reported levels of knowledge and confidence in managing patients with suicidality. Secondary outcomes included self-reported familiarity with the national guideline and suicide prevention organisation, training uptake, guideline adherence, available institutional resources, and perceived needs to improve care. Using multivariable regression analysis, primary outcomes and guideline adherence were compared between healthcare professions, departments and hospitals.

Results A total of 736 healthcare professionals (67% ED/33% ICU) participated. Reported knowledge and confidence were modest: 53% of ED staff and 42% of ICU staff scored ≥ 3 on knowledge, and 84% and 63% scored ≥ 3 on confidence (1–5 scale). Among ED and ICU staff, 85%/90% reported insufficient knowledge of the guideline, 42%/52% unfamiliarity with the national suicide prevention organization and 18%/29% had never participated in suicide prevention training or professional development. Mean guideline adherence scores were 3.5 (ED) and 3.6 (ICU); institutional resources scored 2.3 (ED) and 2.6 (ICU) (1–5 scale). Perceived needs included improved access to psychiatric review, expert consultation, training and education. Levels of knowledge and confidence were higher among ED staff and medical doctors compared to ICU staff and nurses. Guideline adherence varied markedly between hospitals.

Conclusions Despite the existence of a national guideline, Dutch EDs and ICUs face challenges in implementing comprehensive suicide prevention. Barriers exist at individual and organizational levels. A multi-level approach is

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needed, including staff training to improve knowledge, organisational commitment, and local protocols outlining essential steps and role clarity for acute care professionals.

Clinical trial number Not applicable.

Keywords Suicide prevention, Acute care, Mental health, Training needs, Guideline adherence, Emergency care

Introduction

In the Netherlands, approximately 1,900 people die by suicide each year [1]. The number of suicide attempts far exceeds the number of deaths: an estimated 40,000 non-fatal attempts occur annually [2]. Of these, 11,700 non-fatal attempts are cared for in an emergency department (ED), accounting for around 0.7% of all ED visits [3, 4]. Many of these patients are subsequently admitted to hospital, with a subset requiring intensive care unit (ICU) admission for close monitoring.

Patients presenting to hospital after a non-fatal attempt are known to have a high risk of suicide [5, 6]. This risk is particularly elevated in the first month following their ED visit [7]. Among those who died by suicide, no less than 40% had visited an ED in the year before their death, often for self-harm or to seek psychiatric help [8]. An estimated 7% of suicide deaths could be prevented if the suicide risk among patients with a hospital contact after an attempt was reduced to that of the general population [9].

In order to reduce suicide deaths, national suicide prevention strategies encompass a diverse range of public (mental) health approaches [10]. Crisis intervention and psychotherapeutic approaches, particularly relevant for patients presenting to EDs, are key components of these strategies [11]. Growing evidence supports the preventive impact of brief suicide prevention interventions such as safety planning, referral to treatment, follow-up case management and cognitive behavioural therapy for patients who have attempted suicide [12, 13]. Since healthcare professionals in EDs and ICUs are often the first to encounter these patients due to acute somatic presentations, they play a crucial role in identifying, supporting and guiding patients to appropriate care. Within mental health settings, there is emerging evidence that improved implementation and adherence to clinical guidelines can effectively reduce suicide rates [14]. Although this relationship has not yet been studied in general hospital settings, the findings of recent research, together with the recognition that suicide prevention in hospitals is a vital link within the national care pathway, suggest that clinical guideline implementation in acute care departments may contribute to suicide prevention.

As early as in 1992, an article published in the Dutch Journal of Medicine outlined minimum requirements for care of individuals presenting at the ED following a suicide attempt [15]. It addressed essential elements such as professional competencies, organization of care within the hospital, collaboration with external providers, triage, patient approach and involvement of relatives, mandatory consultation with a mental health professional, and the need for a formal hospital protocol to guide care. In 2012 the national multidisciplinary guideline on suicide prevention was published, which included a section focused on care in the ED, addressing similar key points [16]. Universal screening for suicidality is not part of Dutch guidelines and is not performed in Dutch EDs.

Despite the existence of guideline recommendations aimed at improving care for patients in the ED who have attempted suicide, challenges appear to persist in delivering such care effectively. Dutch ED professionals have reported lacking the knowledge and skills to meet the needs of patients with suicidality, due to limited time and training [17]. International literature highlights various challenges in emergency settings, such as time pressure, lack of privacy, limited collaboration with mental health professionals, insufficient training and education, and cultural, environmental, and communication factors, all of which can undermine the effectiveness of suicide prevention interventions [18, 19]. The level of guideline adherence among acute care staff and the extent of their training in the Netherlands is currently unknown. To our knowledge, no international studies have examined the degree of clinical guideline implementation for suicide prevention in general hospitals.

To enhance suicide prevention efforts in acute hospital settings, it is essential to understand current practices in EDs and ICUs, assess how well professionals feel equipped to provide suicide preventative care and identify health workers' perceived needs for improvement. Ultimately, these insights should support the improved implementation of key suicide prevention guideline recommendations in routine practice within general hospital settings. The primary objective of the current study was to assess healthcare professionals' knowledge and confidence in managing patients with suicidal behaviour in EDs and ICUs across the Netherlands, and to compare these outcomes across professions, departments, and hospitals. Secondary objectives included evaluating familiarity with the national suicide prevention guideline and organization, training uptake, guideline adherence, and available institutional resources. Finally, we explored perceived needs for improved suicide prevention practices.

Methods

Study design

This study employed a cross-sectional design using a survey among ED and ICU healthcare professionals in general hospitals in the Netherlands. It is part of the 'Suicide Prevention in Clinical Emergencies' (SPICE) study.

Participants

The study was conducted in 18 hospitals between 2020 and 2022. The participating hospitals were located across 10 of the 12 Dutch provinces and included one academic/tertiary, four top-clinical and 13 secondary hospitals. The average number of ED admissions was 73 patients per day (range: 26–154). Hospitals were recruited to participate in a suicide prevention learning network aimed at enhancing prevention efforts within hospitals. As a baseline assessment for future action planning, a voluntary questionnaire was distributed to all ED and ICU healthcare professionals of the participating hospitals. Distribution was coordinated by each hospital's designated suicide prevention focal point. Staff were invited via email, supported by reminder posters and two follow-up emails over a six-week period. Completion of the questionnaire took approximately 10 min.

Survey instrument

The questionnaire was developed by a multidisciplinary expert group, including a psychiatrist, ED physician, ICU nurse, and suicide prevention researchers, using existing instruments where available. When suitable tools were lacking, new items were created collaboratively. The questionnaire was piloted in a non-participating hospital, after which minor clarifications were made. Data were collected using Qualtrics. The online questionnaire included socio-demographic and work-related characteristics, i.e. age-group, professional discipline, department, years of clinical experience, and number of patients with suicidal behaviour attended to in the previous four weeks. A translation of the full questionnaire is included as additional file.

Primary outcomes

Self-reported knowledge (7 items) and confidence (3 items) in suicide prevention were assessed using subscales from the Question, Persuade, Refer (QPR) questionnaire and Confidence and Beliefs Questionnaire (CBQ) [20, 21]. These instruments had previously been translated into Dutch and were designed to measure pre- and post-training differences in knowledge and confidence [22]. Items were scored on a 5-point Likert scale with higher scores indicating greater perceived knowledge and confidence. Internal consistency was $\alpha = 0.83$ for knowledge and $\alpha = 0.61$ for confidence, as assessed by Cronbach's α.

Secondary outcomes

1. *Familiarity with the guideline and national suicide prevention organization*: participants scored this on a 4-point Likert scale: 1 (never heard of), 2 (know by name), 3 (know generally what it entails), 4 (know exactly what it entails).
2. *Training uptake*: participants reported participation in professional development activities over the past year and earlier, including clinical teaching, e-learning, articles, local protocol (other), training/workshops. They also indicated whether suicide prevention was included in their pre-service training.
3. *Guideline adherence*: thirteen key interventions were grouped into four categories: 'engagement with the suicidal patient' (4 items), 'safety management', 'involving support network', and 'continuity of care' (3 items each). Participants rated each item on a 5-point Likert scale (1 = very unlikely, 5 = very likely). Subscale and total scores were calculated, with higher scores indicating greater adherence. Cronbach's α values were 0.79 (engagement), 0.82 (safety), 0.49 (support network), and 0.54 (continuity), with an overall α of 0.82.
4. *Institutional resources*: the items 'sufficient time', 'short waiting times for psychiatric evaluation', and 'access to psychiatric consultation' were each rated on a 5-point scale (1 = never, 5 = always).
5. *Perceived needs*: participants rated 11 proposed measures to improve the quality of care for patients with suicidality, either within their department or in the broader regional care network. An open-ended question allowed them to provide additional ideas.

Statistical analysis

Data were analysed in R Studio version 4.0.3. Missing data were minimal, ranging from 1% for primary outcomes to 6% for 'guideline adherence'. Analyses were conducted using available data per outcome. No imputation was performed. Descriptive analyses were used to examine the distributions of professional discipline, age, years of clinical experience, and the number of recent encounters with patients with suicidal behaviour, separately for ED and ICU professionals.

Mean scores and standard deviations were calculated for the outcomes 'knowledge', 'confidence', and 'institutional resources', including the reverse-scored item for 'confidence'. For 'guideline adherence' this was computed separately for each category as well as for the total sum score. Welch t-test was used to assess differences in 'knowledge', 'confidence' and 'guideline adherence' between teams (ED versus ICU) and across professional disciplines (medical doctor versus nurse).

For 'familiarity with the guideline and national suicide prevention organization,' scores 1/2 were classified as 'no knowledge,' 3/4 as 'some/much' knowledge. Corresponding proportions were calculated. Proportions were also calculated for 'professional training uptake' (i.e., 'no training,' 'skills training/workshop' or 'other') and for participants who received 'suicide prevention in their pre-service training,' stratified by discipline and department. Differences between EDs and ICUs across hospitals were further examined using three continuous outcome measures ('knowledge,' 'confidence,' and 'guideline adherence'), which were each rescaled to a 0-10-point scale for easier interpretation and to allow comparison across scales of different lengths (7, 3, and 13 items). Total scores were first rescaled to a 0–4 range by subtracting the number of items and dividing by (items × 4). These values were then multiplied by 10.

To assess whether differences between hospitals could be explained by profession (medical doctor vs. nurse), training (attended training/workshop), or years of work experience, we compared a multilevel model including these variables as fixed effects to the same model with an additional random effect for hospitals. Differences between the models were assessed using a likelihood ratio test. Separate analyses were conducted for ED and ICU. For both departments two models were created with 'knowledge and confidence' (combined) and 'guideline adherence' as the outcome variables.

Open-ended responses to the single qualitative item on additional perceived needs were analysed thematically. Initial coding was conducted by one researcher (YL), as the responses were concrete and could easily be categorized. To ensure consistency and accuracy in theme development, the resulting themes were reviewed and finalized in collaboration with a second researcher (KL).

Table 1 Basic characteristics of participants

	Emergency Department *N* (%)	Intensive Care Unit *N* (%)	Total *N* (%)
Occupation			
Nurses	361 (73)	209 (87)	570 (77)
Medical doctors	135 (27)	31 (13)	166 (23)
Age group			
18–34	193 (39)	69 (29)	262 (36)
35–54	248 (50)	118 (50)	366 (50)
55+	52 (11)	51 (21)	103 (14)
Clinical work experience in years			
< 1	15 (3)	0	15 (2)
1–5	61 (12)	25 (10)	86 (12)
6–10	77 (16)	39 (16)	116 (16)
11–15	100 (20)	29 (12)	129 (18)
> 15	238 (48)	146 (61)	384 (52)
Number of suicidal patients in past 4 weeks*			
Nurses	2 (1–4)	2 (1–3)	2 (1–4)
Medical doctors	2 (1–4)	2 (2–3)	2 (1–4)
Total participants			
	496	240	736

*Number of suicidal patients: median (IQR)

Results

Study population

EDs from all 18 hospitals participated, with 11–55 respondents per site (median = 27) and ICUs from 12 hospitals participated with 3–37 respondents per site (median = 20). A total of 736 healthcare professionals completed the questionnaire, including 570 nurses and 166 medical doctors. Two-thirds of participants were employed in EDs (more details are presented in Table 1). In the four weeks prior to the survey, 69% had encountered 1–5 patients with suicidality, 13% reported not having encountered any.

Current self-reported knowledge, confidence, familiarity with the guideline and National suicide prevention organization, training uptake and guideline adherence

Mean knowledge scores among ED and ICU healthcare professionals were 20.7 and 19.2, respectively (maximum score: 35) (more details are presented in Table 2). Among ED staff, 53% (260/491) had a mean score of ≥ 3 across the knowledge items (scale 1–5), with 3% (16/491) scoring ≥ 4. ICU professionals reported slightly lower scores, with 42% (99/238)) scoring ≥ 3 and 3% (35/238) ≥ 4.

Mean confidence scores were 10.2 for ED and 9.2 for ICU professionals (maximum score: 15) (Table 2). In the ED group, 84% (408/488) had a mean score ≥ 3 across the confidence items, and 27% (130/488) ≥ 4. IC staff again reported lower levels, with 63% (149/238) scoring ≥ 3 and 15% (35/238) ≥ 4.

Most ED and ICU participants (85% and 90%) reported lacking knowledge of the national suicide prevention guideline, and around half were unfamiliar with the national suicide prevention organization (42% and 52%) (Table 2).

Approximately half (44% in EDs/51% in ICUs) reported having had no recent (< 1 year) professional development activities in suicide prevention. A notable proportion indicated never having received any related training or professional development (18%/29%). Only small minorities (19% in EDs/10% in ICUs) reported that suicide prevention had been included in their pre-service nursing or medical training (Table 2).

Mean scores for guideline adherence were 3.5 in EDs and 3.6 in ICUs (maximum score: 5). In both settings, two specific guideline recommendations, 'informing the support network about suicide prevention organizations' and 'developing a safety plan with the patient', were rated as unlikely to be followed (mean score < 3).

Table 2 Self-reported knowledge, confidence, training uptake, guideline adherence and available institutional resources per profession and department

	Emergency department			Intensive care unit		
	Nurses	**Medical doctors**	**Department**	**Nurses**	**Medical doctors**	**Department**
Knowledge mean (SD) Min 3 - max 15	20.4 (3.8)	21.5 (3.5)	20.7 (3.8)	19.1 (3.6)	20.4 (3.8)	19.2 (4.0)
Confidence mean (SD) Min 3 - max 15	10.0 (1.9)	10.8 (1.6)	10.2 (1.8)	9.1 (2.0)	10.0 (1.8)	9.2 (2.0)
Knowledge about guideline n (%)						
None	306 (85)	115 (85)	421 (85)	192 (92)	28 (90)	220 (92)
Some / exact	54 (15)	20 (15)	74 (15)	17 (8)	3 (10)	20 (8)
Knowledge about suicide prevention organization n (%)						
None	152 (42)	57 (42)	209 (42)	110 (53)	14 (45)	124 (52)
Some / much	208 (58)	77 (57)	285 (58)	99 (47)	17 (55)	116 (48)
Training uptake – 1 year n (%)						
None	149 (41)	68 (50)	217 (44)	107 (51)	16 (52)	123 (51)
Training/workshop	31 (9)	0 (0)	31 (6)	11 (5)	0 (0)	11 (5)
Other	190 (53)	63 (47)	253 (51)	88 (42)	12 (39)	100 (42)
Training uptake – ever n (%)						
Nothing	69 (19)	21 (16)	90 (18)	76 (36)	9 (29)	85 (35)
Training/workshop	45 (12)	11 (8)	56 (11)	15 (7)	1 (3)	16 (7)
Other	232 (64)	98 (73)	330 (67)	111 (53)	18 (58)	129 (54)
During pre-service training	69 (19)	27 (20)	96 (19)	27 (13)	3 (10)	30 (13)
Guideline adherence mean (SD)						
Engagement	3.4 (0.8)	3.8 (0.7))	3.6 (0.8)	3.2 (0.8)	3.6 (0.7)	3.2 (0.8)
Safety	3.8 (1.0)	3.7 (0.9)	3.8 (0.9)	4.0 (0.9)	4.4 (0.7)	4.1 (0.9)
Involving support network	3.4 (0.7)	2.9 (0.7)	3.3 (0.7)	3.3 (0.8)	3.2 (0.7)	3.3 (0.8)
Continuity of care	3.1 (0.8)	3.5 (0.5)	3.2 (0.7)	3.4 (0.8)	3.7 (0.7)	3.4 (0.8)
Total	3.4 (0.6)	3.5 (0.5)	3.5 (0.6)	3.4 (0.6)	3.7 (0.4)	3.6 (0.6)
Institutional resources mean (SD)						
Time to establish therapeutic rapport	2.5 (0.8)	2.5 (1.0)	2.2 (0.8)	2.9 (0.9)	3.1 (1.1)	2.9 (0.9)
Short wait for psychiatric evaluation	2.0 (1.0)	2.2 (1.0)	2.0 (1.0)	2.5 (1.1)	3.2 (1.3)	2.6 (1.2)
Awareness of discharge plan	1.9 (1.0)	1.8 (0.8)	1.9 (1.0)	1.9 (1.1)	2.5 (1.2)	2.0 (1.1)
Access to psychiatric evaluation	2.6 (1.2)	3.3 (1.1)	2.7 (1.2)	2.6 (1.0)	3.5 (1.0)	2.7 (1.1)
Total	2.2 (0.7)	2.4 (0.6)	2.3 (0.7)	2.5 (0.7)	3.0 (0.9)	2.6 (0.7)

Mean scores for 'availability of institutional resources' were 2.3 (ED) and 2.6 (ICU). Overall, all items scored below 3 in both settings, indicating that resource availability was perceived as limited. 'Awareness of discharge plan' received the lowest score, suggesting that many professionals were unaware of the importance of making after-discharge arrangements (Table 2).

Differences in current self-reported knowledge, confidence, and guideline adherence between professions, teams and hospitals

ED staff scored significantly higher on combined 'knowledge and confidence' compared to ICU staff ($t(446) = -6.51$, $p < 0.0001$). Medical doctors scored higher than nurses ($t(296) = 5.98$, $p < 0.0001$).

There was no statistically significant difference in reported adherence to guideline recommendations between ED and ICU teams ($t(414) = 0.53$, $p = 0.60$). However, medical doctors reported higher adherence than nurses ($t(341) = 2.91$, $p < 0.05$).

Multilevel regression analysis included all 18 EDs. For ICUs ($n = 10$), two units were excluded due to a low response rate (< 10 respondents). The multilevel regression analysis for combined 'knowledge and confidence' showed no significant differences between EDs (χ^2=2.07; $p = 0.15$) or between ICUs (χ^2=2.32; $p = 0.13$). In contrast, reported 'guideline adherence' varied significantly between EDs (χ^2=15.29; $p < 0.0001$) and ICUs (χ^2=8.30; $p < 0.001$) (Figs. 1 and 2).

Needs

Perceived needs for improving the quality of care for patients experiencing suicidality were notably similar across all professional groups. The most frequently reported needs included 'shorter waiting times for psychiatric reviews' (51% and 62%, respectively), 'training and education' (49% and 52%), and 'access to expert consultations' (39% and 57%). Over one-third of ED nurses (38%) highlighted the value of 'a pocket card containing sample questions and guideline recommendations.

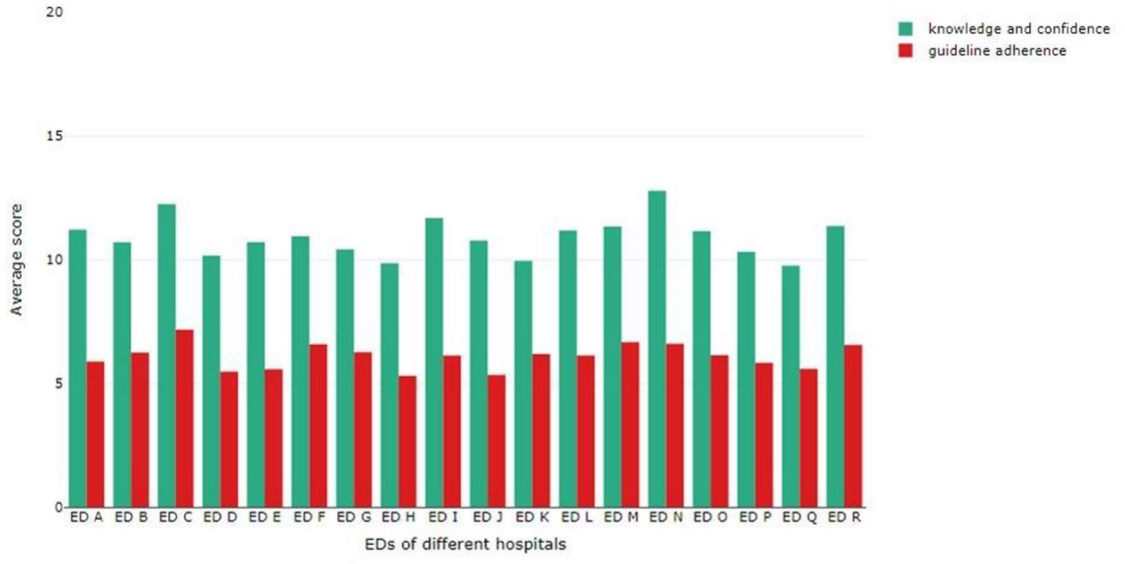

Fig. 1 Differences between EDs in self-reported 'knowledge and confidence' (maximum score 20) and 'guideline adherence' (maximum score 10)

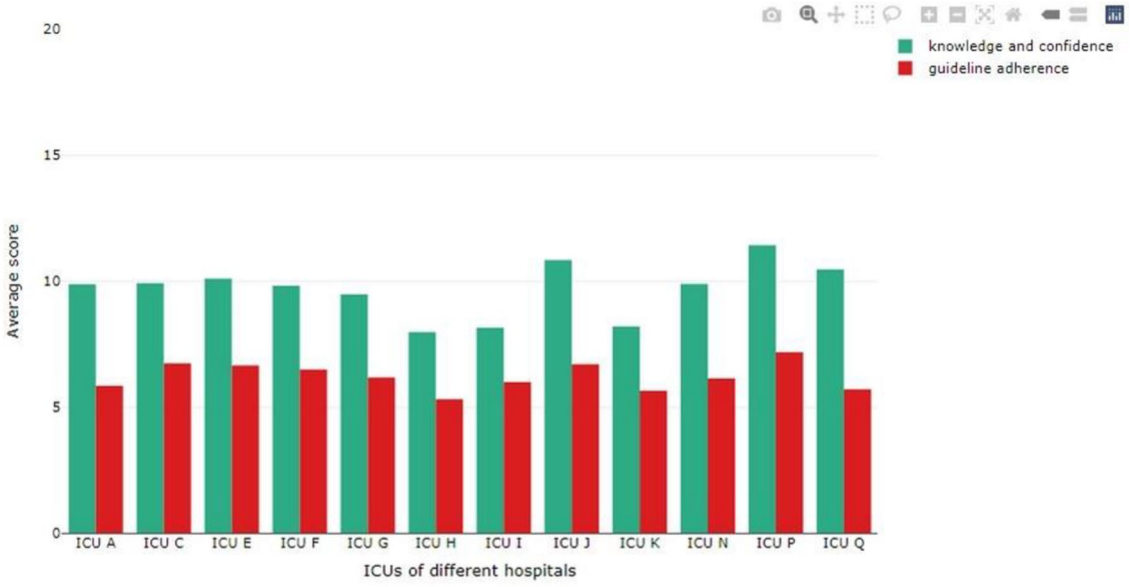

Fig. 2 Differences between ICUs in self-reported 'knowledge and confidence' (maximum score 20) and 'guideline adherence' (maximum score 10)

Analysis of responses to the open-ended question ($n = 159$) for improving care revealed four themes: (1) need for training (2), improved collaboration with, and support from mental health services (3), more time to spend at the patient's bedside and (4) a care environment better adapted to meet patients' needs, including a quiet room offering both safety and distraction.

Discussion

This study revealed that self-reported knowledge of suicide prevention among healthcare professionals in EDs and ICUs in the Netherlands is limited, with only slightly higher levels of self-reported confidence. These findings are unsurprising, given the minimal emphasis on suicide prevention education reported by professionals throughout their careers. Additionally, participants reported insufficient institutional resources, which may negatively impact the quality of care for patients experiencing suicidality.

Despite these findings, healthcare professionals reported fairly frequent adherence to several key guideline recommendations, such as ensuring a safe environment to minimize harm and initiating a psychosocial assessment. However, other recommendations- such as involving the patient's support network, taking time to discuss suicidality, and developing safety plans were less

commonly implemented, despite their potential to prevent repeated attempts [16, 23]. These gaps may reflect insufficient knowledge or confidence, lack of role and task clarity and organisational support. This is supported by healthcare professionals' identified possibilities for improvement, such as enhanced training, access to interprofessional consultation, clear guideline summaries, and more time at the bedside. The observed variation in guideline adherence between EDs and ICUs underscores the challenges in implementing the national guidelines consistently across hospital settings.

Our findings align with previous research amongst ED workers, highlighting both individual and organizational barriers to suicide prevention. Consistently reported challenges include insufficient knowledge, skills, and confidence alongside organizational issues such as limited collaboration between acute care providers and mental health professionals, restricted access to mental health services, and inconsistent implementation of evidence-based practices like safety planning and follow-up care. Additional priorities include adapting the hospital environment (e.g. providing quiet rooms), ensuring adequate time for patient care, and reducing stigma [17, 18, 24, 25]. Patients' experiences of feeling dismissed or mistreated in EDs further underscore persistent care gaps [26].

The implementation of national suicide prevention guideline in Dutch general hospitals may be affected by the healthcare structure. In the Netherlands, there is a distinct separation between somatic and mental health care, which may contribute to a limited focus on psychological support within somatic settings and insufficient collaboration between mental and somatic care in acute settings. Additionally, there is evidence of stigmatization of patients with psychiatric problems within Dutch healthcare, which may lead healthcare professionals to approach or treat these patients differently [27, 28]. Alongside this, it is important to note that while the national suicide prevention guideline outlines *what* needs to be done, it does not always specify *by whom* or *how* this should be carried out. For example, it remains unclear how to secure patient safety in the ED or who should draw up the safety plan after a suicide attempt.

A central challenge is how to effectively translate national guideline recommendations and evidence-based interventions into local hospital practice. Literature shows that successful implementation of targeted hospital-based interventions requires addressing barriers and facilitators across three key domains: the system, the staff, and the intervention [29]. Translating our findings into practical recommendations yields several key considerations across the three domains. Hospitals should prioritize training time and ensure that healthcare workers have sufficient time to spend at the patient's bedside, while also fostering strong collaboration with external care partners. Enhancing staff knowledge and confidence is essential, as it may also strengthen professional commitment and acceptance of responsibilities related to suicide prevention [30, 31]. Interventions should be clearly defined so that staff understand exactly what is expected of them, who is responsible for each task, and how these tasks should be carried out in daily practice.

While participating hospitals face common challenges, context-specific barriers are also likely to occur, reflecting differences in knowledge or guideline adherence between professions, teams, and hospitals. Therefore, an implementation approach is recommended that addresses both shared barriers and the unique context of each setting [32]. In mental healthcare settings in the Netherlands, a network-based approach has been proven effective in improving guideline adherence for suicide prevention [33]. General hospitals may also benefit from adopting a similar multi-level implementation strategy, where each institution develops and implements a local suicide prevention strategy supported by inter-institution learning, shared tools, and tailored training programs.

Limitations and strengths

This study has several strengths, including a large sample size, a real-world focus on guideline adherence, inclusion of ICU staff, a group rarely studied in this context, and a novel comparison of care across multiple hospitals. However, there are also limitations. Not all staff filled out the questionnaire, which introduces the risk of non-response bias. The use of self-reported questionnaires also carries the risk of socially desirable or negatively skewed answers. Moreover, participating hospitals joined a suicide prevention network, suggesting possible selection bias and limiting generalizability. Finally, the study did not capture patients' experiences, nor did it include objective clinical data, (e.g. how often safety planning was carried out), limiting both insight into patient-professional interaction and the triangulation of self-reported perceptions with real-world practice.

Conclusion

This study provides novel insight into the challenges of suicide prevention in EDs and ICUs within Dutch general hospitals. While national guidelines offer important recommendations, our results suggest that, even in a high-income country with a long-standing national suicide prevention strategy, there are significant gaps in the implementation of suicide prevention practices in acute hospital settings, underscoring the need for targeted action at multiple levels of care. These findings call for a comprehensive, context-specific approach, which must strengthen knowledge and skills through targeted training programs, ensure a clear and locally adapted translation of the guideline into practical protocols and defined

responsibilities, and improve collaboration with community and mental health services. A network-based model that promotes knowledge and tool sharing may support more effective and consistent implementation. Given that comparable challenges have been reported in other countries, similar recommendations are likely to apply for international healthcare systems.

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12873-025-01331-8.

Supplementary Material 1

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Author contributions
KL: design, analysis, interpretation of data, drafted the work. YL: analysis, interpretation of data, substantively revised. DB: design and substantively revised. MV: substantively revised. RG: design and substantively revised. SM: design, analysis, interpretation of data, drafted the work.

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

Declarations

Ethical approval
The Medical Ethics Review Committee (METC) of Leiden University Medical Center issued a non-WMO declaration, N21.033. Ethical standards were followed, including providing an online information letter and obtaining informed consent from all participants. Approval was obtained from each hospital's board of directors.

Competing interests
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