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Training health care professionals in safety plan implementation to prevent suicide reattempts: A systematic review

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ABSTRACT

Background: With millions of suicide attempts occurring worldwide each year, suicide prevention is crucial. Brief intervention and contact, particularly a safety plan, provided in health care settings is effective in reducing suicide risk. However, little is known about the training of professionals in safety plan implementation and the impact of this training.
Objective: To describe the characteristics and impact of safety plan training for nurses and other health care professionals in health care settings.
Design: Systematic review
Methods: The Medline, Embase, CINAHL, PsycInfo, Cochrane Library and ScienceDirect databases were systematically searched in October 2025 for including studies published since 2008.
Two authors independently screened titles and abstracts, then assessed full texts for eligibility and extracted data. Disagreements were resolved through discussion with a third author. The Joanna Briggs Institute critical appraisal tools were used to assess the quality of the included studies. PRISMA recommendations were followed for this reporting.
Results: Among the 484 identified studies~~,~~ four observational studies were included. Three studies were conducted in the United States and one in Argentina. They involved 666 participants including medical students, nurses, qualified health care professionals, and social workers.
In three studies, training durations ranged from 2 ~~and~~ to 3 hours. In all studies, the training was conducted in person and combined theoretical inputs, practical safety planning recommendations and role plays.
Knowledge assessed in one study seemed to improve immediately after training (mean: 3.45 (standard deviation (SD): 2.35) vs.: 5.98 (SD: 2.92), $p < 0.0001$) but declined at 6 months (5.98 (SD: 2.92) vs. 4.08 (SD: 2.77), $p < 0.001$).
An improvement was observed immediately following the training or at 6 month in attitudes (two studies), behavioral change variables (three studies), and related factors including attitudes (three studies), perceived behavioral control (three studies), intention (two studies), emotions (one study), and behavior (two studies) and emotions (one study).

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Participants' satisfaction evaluated in two studies was positive in relation to the perceived usefulness of the training.
Conclusion: Safety plan training programs have been described in few studies. The evaluation criteria varied. Studies findings suggested a positive impact of training, but attention should be given to a potential decrease in knowledge 6 months after training.

What is already known?

- Multidimensional care in health care settings is required for preventing suicide.
- Safety plans reduce suicidal behavior and are recommended in several countries.
- There is limited data available on the content and impact of safety plan training

What this paper adds?

- Safety plan training has been poorly documented in a few observational studies.
- Training is brief, interactive, and assesses multidimensional determinants of changes.
- Safety plan training improves key outcomes, but knowledge may decline at 6 months.

1. Background

In 2021, nearly 746,000 people died by suicide worldwide (Weaver et al., 2025). Among young people aged 15–29, suicide is of particular concern, as it is the fourth leading cause of death (World Health Organization, 2021a). To reduce the global suicide rate by one-third by 2030, the World Health Organization recommends improving the identification, assessment and treatment of people with suicidal ideation or behaviour through national suicide prevention strategies (World Health & Organization, 2021b). In a longitudinal study of approximately 5900 individuals who died by suicide over 10 years, 83% of the victims had a health care visit in the year before death (Ahmedani et al., 2014). These contacts provide opportunities to intervene through suicide prevention interventions (Chitty et al., 2023).

Healthcare and social workers play crucial roles in managing suicidal crises (Anderson and Jenkins, 2006; Maple et al., 2017; Marutani et al., 2016; Raymond et al., 2020; Younes et al., 2020). Nurses are particularly recognized for their role in identifying and assessing suicide risk and preventing suicide by mobilizing a range of clinical, relational and communication skills (Sun et al., 2005). Training is a crucial factor in determining the quality of care provided (Bolster et al., 2015; Chan et al., 2009). A literature review on training interventions for the management of self-harm in emergency departments revealed that training has the potential to improve the knowledge, attitudes and skills of health care professionals (Zarska et al., 2022).

The Zero Suicide Model, a theoretical framework launched in the United States in 2012, promotes a comprehensive approach to suicide prevention, including the training of professionals (Brodsky et al., 2018; Labouliere et al., 2018; National Action Alliance for Suicide Prevention: Clinical Workforce, 2014). The training focuses on understanding the onset and development of suicidal ideation and the use of prevention strategies, particularly tools based on cognitive and behavioral theories. Brief interventions and contact are based on these theories and on social support, suicide prevention education and the identification and/or learning of stress management strategies (Berrouiguet et al., 2018; Milner et al., 2016; O'Connor and Nock, 2014; Stanley and Brown, 2012). These measures make it possible to set up a follow-up system with as little interference as possible in the patient's daily life, with the aim of maintaining a long-term connection with telephone calls, postcards, or safety plans (Berrouiguet et al., 2018; Milner et al., 2016).

In a meta-analysis, three randomized controlled trials (n = 1041) demonstrated the effectiveness of brief intervention and contact in preventing suicide risk compared with usual care, with lower odds of suicide (odds ratio (OR): 0.20, 95% confidence interval (CI): 0.09; 0.42) (Riblet et al., 2017).

Another meta-analysis confirmed the effectiveness of these interventions in preventing suicide attempts up to six months after the act of suicide compared with nonpharmacological interventions (OR: 0.65, 95% CI: 0.44; 0.94) (Hu et al., 2024). The effectiveness of brief interventions lasting 12 months for individuals with suicidal ideation and up to 24 months for individuals with suicide attempts was also highlighted in another meta-analysis (Tay and Li, 2022).

A classification of brief interventions gives a central place to the safety planning intervention (Doupnik et al., 2020; Homan et al., 2023). The development of the safety plan is tool has been promoted in the context of multidisciplinary care, where patients can share their own safety plan with their entire care network (Grant and Lusk, 2015). Completing a safety plan is identified as one of the psychiatric nursing competencies in the United States (American Psychiatric Nurse Association, 2015).

The safety plan consists of a progressive list of strategies adapted to the patient's level of psychological distress (Stanley and Brown, 2012). In a cohort study of 1640 patients, suicidal behaviour was largely reduced at six months in the safety plan intervention group compared with the usual care control group (OR: 0.56; 95% CI; 0.33; 0.95) (Stanley et al., 2018). Other systematic reviews have corroborated these results, demonstrating a 43% reduction in suicidal behaviour (OR: 0.57; 95% CI: 0.41; 0.80) (Nuij et al., 2021) and highlighting increased adherence to treatment for individuals for whom a safety plan has been offered (Ferguson et al., 2021). While the effectiveness of the safety plan has been documented internationally, to our knowledge, there has been no evaluation of the

methods used to train nurses and other health care professionals in safety plans or of the impact of the training.

2. Review question

The research question of our review is as follows: What are the characteristics and impacts of training programs for nurses, healthcare workers and healthcare students to implement a safety plan for adults following a suicide attempt?

3. Method

3.1. Search strategy

Our review adheres to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) method for reporting systematic reviews (Page et al., 2021). The search was conducted in October 2025 following the Peer Review of Electronic Search Strategies (PRESS) guidelines (McGowan et al., 2016). The Medline, Embase, CINAHL, PsycInfo, Cochrane Library and ScienceDirect databases were searched to retrieve publications from January 1, 2008 to October 17, 2025. The electronic search was complemented by a manual screening of the reference lists of the included studies. All of the search algorithms included natural language and were based on the specific thesaurus (MeSH terms and Emtree terms) adapted to each database. These can be found in the supplementary material.

3.2. Eligibility criteria

Studies in which adult safety plan training for healthcare workers and healthcare students and its impact were described were included. Quantitative, qualitative or mixed studies in English or French published between 2008 and 2025 were included. The start of the selection period was determined based on the 2008 publication of the reference manual, Safety Planning Intervention, by Stanley and Brown. This publication marked the formalization of the approach. The outcomes were a) the study characteristics, including the number and profiles of participants and trainers; b) the characteristics of the training, including the general and specific objectives, training methods and tools utilized; c) the criteria employed to assess the training; and d) the impact of the training on participants' behavioral change determinants, such as knowledge, attitudes, perceived behavioral control, intention, emotions, and behaviour, and participants' satisfaction with the training.

Publications in which distance learning methodologies, including e-learning and massive open online courses, were excluded. Grey literature, letters, editorial comments, literature reviews and study protocol were not included.

3.3. Study selection

After removing duplicates, two authors (BC, AV) independently screened all records by title and abstract, under the supervision of a third author (JL). All references were imported into Rayyan for screening. The full-text assessment and final study selection were performed independently by both authors, and any disagreements were resolved through discussion with the third author (JL).

3.4. Data collection and analysis

Data extraction was carried out by two authors (BC, AV) and supervised by a third author (JL). A content analysis was used to extract the data according to the following predefined categories: a) general characteristics of the studies, using the Cochrane data collection form for intervention reviews (Chandler et al., 2019): first author, year, country, objectives, study design, setting, and participants; b) characteristics of the training program, including general and specific educational objectives, training methods (duration, format, and trainer profile), organization and tools used; c) training assessment criteria; and d) impact of the training and participants' satisfaction with the training.

3.5. Quality assessment

Critical appraisal of the quality of the studies was performed by two authors using the Joanna Briggs Institute critical appraisal tools for cross-sectional studies (Moola et al., 2020). In the event of disagreement, a third reviewer (JL) was called upon. The review was registered on 20/06/2022 with Prospero (CRD42022334858) and updated.

3.6. Data synthesis

Due to the anticipated heterogeneity of the included studies in terms of populations, interventions, and outcome measures, a narrative synthesis was conducted. The findings were grouped and summarized according to key themes related to training characteristics and impacts on participant outcomes.

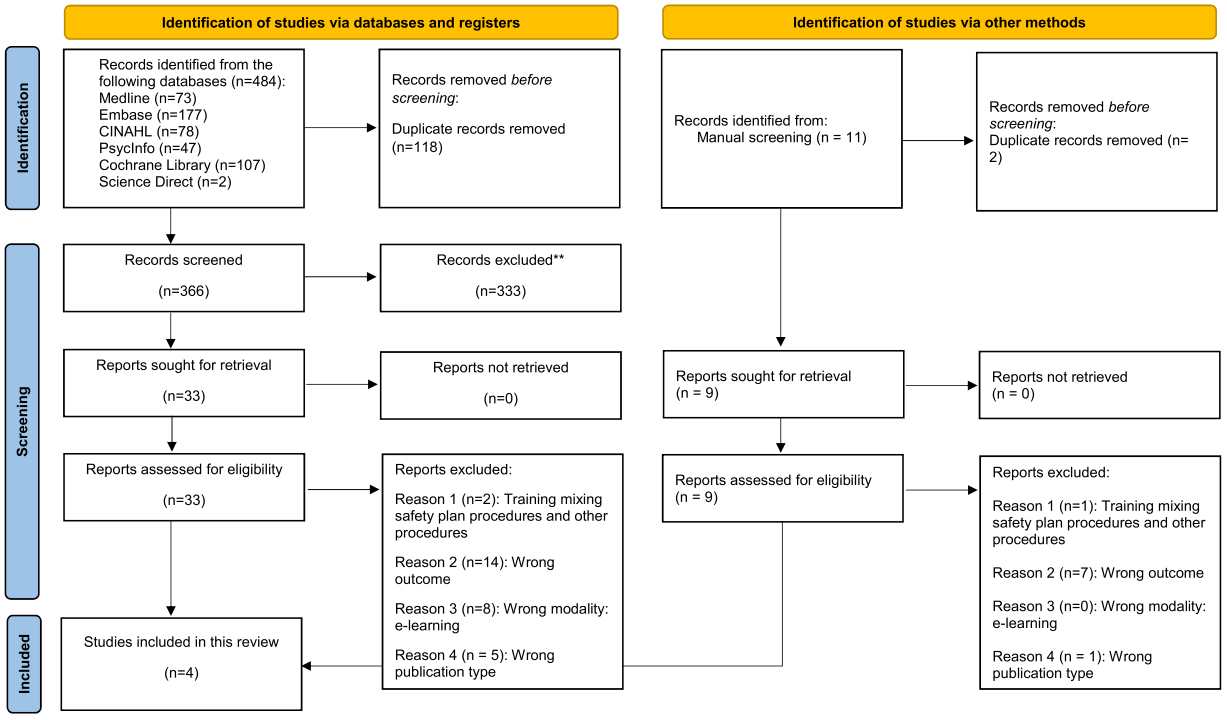

Fig. 1. PRISMA flowchart.

4. Results

Overall, 484 references were extracted. After the removal of duplicates, 366 references remained. The review of titles and abstracts led to the exclusion of 333 references, and 33 full texts were screened. Four studies met the eligibility criteria and were included (Bender et al., 2021; Price et al., 2022; Rodante et al., 2025; Stewart et al., 2020). Manually screening of the reference lists of the included studies revealed no additional result. A flowchart of study selection is shown in Fig. 1.

4.1. Study characteristics

4.1.1. Country of origin, participants and settings

Of the studies included, three were conducted in the United States, and one in Argentina (Table 1). The studies comprised a sample of 666 participants. Most participants were students, with 518 (78%) students taking part in training across two studies, including 490 (100%) and 28 (on 95; 29%) healthcare students, respectively (Bender et al., 2021; Price et al., 2022). Physician or psychiatrists from three studies represented 8% of the total sample: 36/69 (52%) in Rodante's study, 13/95 (14%) in Bender's study, and 2/12 (17%) in Stewart's study (Bender et al., 2021; Rodante et al., 2025; Stewart et al., 2020). A total of 38 (6%) were nonlicenced mental health professionals (social workers, counsellors, occupational therapy), 23/95 (24%) in Bender's study, 10/69 (14%) in Rodante's study and 5 /12 (42%) participants in Stewart's study (Table 2).

In three studies, training was provided either entirely (Price et al., 2022) or partly in health care settings (Bender et al., 2021). Training was also conducted at university counselling centers (Stewart et al., 2020), behavioral health care centers and community service agencies (Bender et al., 2021). In three studies, participants' experiences with safety planning were assessed prior to training (Bender et al., 2021; Rodante et al., 2025; Stewart et al., 2020). In one study, participants reported that safety plans had already been developed for approximately 13% of the individuals they had clinically evaluated. (Stewart et al., 2020).

All four studies were quantitative, observational, and before-and-after studies. The methodological quality was found to be low to average (Table 3).

4.2. Training objectives

Six general objectives were identified, namely, (1) develop the knowledge and skills of the participants (Bender et al., 2021; Price et al., 2022; Rodante et al., 2025; Stewart et al., 2020), (2) increase participants' confidence in their safety planning skills (Bender et al., 2021; Rodante et al., 2025; Stewart et al., 2020), (3) improve participants' attitudes towards the safety plan and the management of suicidal patients (Rodante et al., 2025), (4) increase participants' intention to use the safety plan (Rodante et al., 2025), (5) improve participants' behaviour in relation to the safety plan (Bender et al., 2021; Rodante et al., 2025; Stewart et al., 2020), and (6) improve

Table 1
Overview of the retrieved studies by year.

First author, (year); country	Objectives	Setting; Participants: n=	Evaluation tool & Measures	Key results			
				Knowledge	Attitudes	Perceived Behavioral Control (PBC) & Intentions	Behaviors & Emotions
Bender et al. (2021); USA	Assessment of a safety plan intervention training program	Behavioral health care centers (n = 6) Community service agencies (n = 5) Behavioral health conference (n = 1) Total participants: n = 95	Pre/posttraining (n = 95) and follow-up questionnaires at 6 months (n = 48) 70 items total: Knowledge: 20 items (yes/no) Attitudes: 8 items (1=strongly disagree to 5=strongly agree) Perceived behavioral control: 12 items (1=strongly disagree to 5=strongly agree) Intentions: 10 items (1=strongly disagree to 5=strongly agree) Behaviors: 11 items (1=strongly disagree to 5=strongly agree) Emotions: 9 items (1=strongly disagree to 5=strongly agree)	Pre: 3.45 (SD: 2.35). Post: 5.98 (SD: 2.92) ($p < 0.0001$*). Follow-up: 4.08 (SD: 2.77) (vs. post: $p < 0.001$*)	Pre: 3.77 (SD: 0.6). Follow-up: 3.90 (SD: 0.55) ($p < 0.01$)	PBC: Pre: 3.91 (SD: 0.45). Post: 4.43 (SD: 0.52) ($p < 0.0001$). Follow-up: 4.15 (SD: 0.45) (vs. post: $p < 0.0001$*). Intentions: Pre: 4.25 (SD: 0.48). Post: 4.53 (SD: 0.50) ($p < 0.0001$*)	Positive emotions: Pre: 3.42 (SD: 0.91). Follow-up: 3.75 (SD: 0.67) ($p < 0.001$*). Negative emotions: Pre: 2.36 (SD: 0.75). Follow-up: 2.29 (SD: 0.71) ($p < 0.01$ *). Behaviors subgroup (n = 27/48): Pre: 2.84 (SD: 1.21). Follow-up: 3.51 (SD: 0.95) ($p < 0.05$ *)
Price et al. (2022); USA	Exploration of medical students' attitudes towards suicide prevention and their attitudes changes during this clerkship safety plan intervention initiative	University of Louisville School of Medicine Total participants: n = 490	Pre/posttraining Attitudes towards Suicide Prevention scale (Herron et al., 2001): 14 items (1=strongly disagree to 5=strongly agree) (Lower scores indicate a better view towards suicide prevention)	-	All-class total Attitudes towards Suicide Prevention score range: 14–70. Student perceptions generally positive: Mean: 27.8 (SD: 6.1). Post-training students were less likely to report discomfort assessing patients for suicide risk ($p = 0.001$) and more likely to report that working with suicidal patients was rewarding ($p = 0.035$*). Mean Attitudes towards Suicide Prevention score: trained students (24.7) vs. non-trained third-year students (29.0).	-	-
Rodante et al. (2025); Argentina	Assessment of the perception of self-efficacy, and the feasibility and usefulness of a training in safety	General hospital and specialized hospital Total	Pre/posttraining and follow-up questionnaires at 8 weeks (n = 43) Pre-training only: Prior knowledge in	-	-	Concern about suicidal patients: Pre: 3.99 (SD: 1.14).	Safety plan perceived as useful: Post: 4.65 (SD: 0.51). Follow-up: 4.19 (SD: 0.82).

(*continued on next page*)

Table 1 (*continued*)

First author, (year); country	Objectives	Setting; Participants: n=	Evaluation tool & Measures	Key results			
				Knowledge	Attitudes	Perceived Behavioral Control (PBC) & Intentions	Behaviors & Emotions
	plan intervention in early career mental health professionals	participants: n = 68	suicide prevention (16 items; 1=totally disagree to 5=totally agree) Pre/post-training and follow-up: Perceived self-efficacy (11 items; 1=totally disagree to 5=totally agree) Immediately post-training and follow-up: Utility and feasibility (9 items; 1=totally disagree to 5=totally agree) Follow-up only: Use of the safety plan and possible obstacles			Post: 4.32 (SD: 0.78). Follow-up: 4.26 (SD: 0.82) (p = 0.34*). Perception of improving patient safety: Pre: 2.3 (SD: 0.96). Post: 1.76 (SD: 0.76) (p < 0.001). Confidence in tools to manage suicidal patients: Pre: 2.61 (SD: 0.89). Post: 3.56 (SD: 0.63) (p < 0.001). Confidence in ability to help clients create a safety plan: Pre: 2.58 (SD: 0.91). Follow-up: 3.84 (SD: 0.57) (p < 0.001). Well prepared to use SPI: Post: 3.53 (SD: 0.61). Follow-up: 3.63 (SD: 0.72)	SPI implementation implies priority change: 3.45 (SD: 1.06). SPI does not represent extra work: 1.61 (SD: 0.77). Continued use at follow-up: 58.1% (n = 25)
Stewart et al. (2020); USA	Assessment of the feasibility, acceptability and perceived usefulness of the safety plan intervention before and after training in the safety plan	Private university counselling center Total participants: n = 12	Pre/posttraining and follow-up questionnaires at 10 weeks (n = 12) Pre-training: 7 items (1=strongly disagree to 5=strongly agree) Post-training: 8 items (1=strongly disagree to 5=strongly agree) Follow-up: 8 items (1=strongly disagree to 5=strongly agree) + 4 open response items	-	-	Confidence in suicide assessment: Pre: 4.19 (SD: 0.75). Post: 4.38 (SD: 0.52). Follow-up: 4.38 (SD: 0.74). Confidence in the ability to help clients create a safety plan: Pre: 4.29 (SD: 0.53). Post: 4.50 (SD: 0.53).	Six of 11 professionals implemented SPI at 10-week follow-up (18 plans). Training was useful for 11 participants: 4.82 (SD: 0.41) and they learned new things: 4.73 (SD: 0.47). Role-playing was the most useful (4/10). Learning specific vocabulary was the most difficult element (20%)

(*continued on next page*)

Table 1 (*continued*)

First author, (year); country	Objectives	Setting; Participants: n=	Evaluation tool & Measures	Key results			
				Knowledge	Attitudes	Perceived Behavioral Control (PBC) & Intentions	Behaviors & Emotions
						Follow-up: 4.38 (SD: 0.75)	

* Differences not shown.
Findings are expressed as the means, SD: standard deviations, as applicable.

participants' emotional responses related to managing suicidal patients (Bender et al., 2021).

In one study, eight specific objectives were delineated; among these objectives were the recognition of the importance of the safety plan in crisis situations, the identification of warning signs of a suicidal crisis and the ability of patients to highlight their reasons for living (Bender et al., 2021).

4.3. Training characteristics

The four studies differed in terms of duration, format, training methods and trainers' involvement.

4.3.1. Procedures and duration

In three studies, the training was conducted in person and lasted between two and two and a half hours (Bender et al., 2021; Stewart et al., 2020) and three hours in Rodante et al. (2025). In the fourth study, the duration of the training was not provided (Price et al., 2022). In two studies, it was indicated that there was a pretesting phase prior to the implementation of the training (Bender et al., 2021; Rodante et al., 2025).

In one study (Stewart et al., 2020), with the support of the director of the university counselling center, all the clinical personnel were available for training purposes during scheduled working hours.

4.3.2. Trainers

In three studies, the trainers were qualified healthcare professionals (Bender et al., 2021; Rodante et al., 2025; Stewart et al., 2020). In the Bender et al. study, the trainers had an average of seven years of experience in the delivery of care and in the implementation of training programs. In another study, the trainers held a doctoral degree and were supervised by the study team (Stewart et al., 2020). The trainers in the Rodante et al. study received extensive training in suicide risk assessment and management. Trainer experience was not specified in two studies (Price et al., 2022; Rodante et al., 2025).

4.3.3. Theoretical phase

In all four studies, the training program began with a presentation of the theoretical information, and these presentations varied in their content. Stewart et al. (2020) and Rodante et al. (2025) presented these informations, with a particular focus on the fundamental principles of the Safety Planning Intervention, lasting one hour in Stewart's study and about 15 min in Rodante's. The program was

Table 2
Participant profiles.

Professions	Bender et al. 2021 n = 95	Price et al. 2022 n = 490	Rodante et al., 2025 n = 69	Stewart et al. 2020 n = 12
Medical students and volunteers	28 (29.5%)	490 (100%)	not applicable	not applicable
Non-licensed mental health professionals (social workers, counsellors, occupational therapy)	23 (24.2%)	not applicable	10 (14%)	5 (42%)
Physicians or psychiatrists*	13 (13.7%)	not applicable	36 (52%)	2 (17%)
Licensed mental health counsellors/clinicians*	10 (10.5%)	not applicable	not applicable	1 (8%)
Behavioral health technicians*	5 (5.3%)	not applicable	not applicable	not applicable
Case managers*	4 (4.2%)	not applicable	not applicable	not applicable
Pastoral counsellors	4 (4.2%)	not applicable	not applicable	not applicable
Clinical psychologists*	2 (2.1%)	not applicable	23 (33%)	4 (33%)
Nurses*	2 (2.1%)	not applicable	not applicable	not applicable
Missing data	4 (4.2%)	not applicable	not applicable	not applicable

* Qualified health care professionals.
Findings are expressed as n (%)4.1.2 Study design and methodological quality.

Table 3
Joanna Briggs Institute critical appraisal tools – Analytical cross-sectional studies (Moola et al., 2020).

Studies	Were the criteria for inclusion in the sample clearly defined?	Were the study subjects and the setting described in detail?	Was the exposure measured in a valid and reliable way?	Were objective, standard criteria used for measurement of the condition?	Were confounding factors identified?	Were strategies to deal with confounding factors stated?	Were the outcomes measured in a valid and reliable way?	Was appropriate statistical analysis used?
Bender et al. (2022)	Unclear	Yes	Yes	Unclear	No	No	Yes	Yes
Price et al. (2022)	Unclear	Unclear	Yes	Yes	not applicable	not applicable	Yes	Yes
Rodante et al. (2025)	Yes	Yes	Yes	Yes	Yes	No	Unclear	Yes
Stewart et al. (2020)	No	Unclear	Unclear	Unclear	Unclear	Yes	Yes	Yes

based on the recommendations set out in the training manual by Stanley and Brown (2008). Bender et al. (2021) provided more general psychoeducational elements on suicidal crises and safety planning, the duration of which was not specified. Finally, Price et al. (2022) described the significance of the safety plan and the manner in which it should be completed without specifying its content or duration. A collaborative approach between patients and health care professionals was encouraged in all three studies (Bender et al., 2021; Price et al., 2022; Stewart et al., 2020). This process, as described by Jobes, is designed to strengthen the therapeutic alliance and increase treatment motivation (Jobes, 2012).

4.3.4. Role play and feedback

In all studies, practice time allotted to the acquisition of behavioral competencies through behavioral skill training was incorporated. Thereafter, the participants were required to either develop a safety plan collaboratively (Stewart et al., 2020) or implement one with the assistance of an experienced peer (Price et al., 2022). The trainer (Stewart et al., 2020) or a peer (Price et al., 2022) conducted role plays. In Rodante et al., the trainer conducted a demonstration before participants engaged in the same role-play (Rodante et al., 2025). Each studies organized a feedback session. The participants were asked to provide a comprehensive account of their experiences with role play and to identify any potential challenges and strategies that could be employed for the implementation of the safety plan.

Table 4
Variables assessed.

	Variables assessed	Authors	Assessment tools	Before training	Posttraining	8–10-week follow-up	6 month follow-up
Assessment variables relating to participants	Knowledge of the safety plan intervention (e.g. knowledge is assessed by a set of concepts that professionals may or may not link to the safety plan) (Bender et al., 2021)	Bender et al. 2021	Questionnaire	✔	(+)		-
	Attitudes towards safeguarding and the safety plan (e.g. whether it was possible to raise the question of access to suicidal means if the patient did not mention it (Bender et al., 2021)	Bender et al. 2021	Questionnaire	✔	(=)		+
	Attitude towards suicide prevention	Price et al. 2022	Questionnaire	✔	(+)		
	Perceived behavioral control (e.g. confident in my ability to help those at risk to develop a safety plan to reduce access to lethal means)	Bender et al. 2021	Questionnaire	✔	(+)		-
		Rodante et al., 2025	Questionnaire	✔	✔	✔	
	Confidence in skills when caring for suicidal people and implementing a safety plan	Stewart et al. 2020	Questionnaire	✔	✔	✔	
		Rodante et al., 2025	Questionnaire	✔	(+)	(+)	
	Intention to use the elements of good practice from the safety plan Utility and feasibility of the safety plan intervention	Bender et al. 2021	Questionnaire	✔	(+)		
		Rodante et al., 2025	Questionnaire		✔	(+)	
	Safety plan implementation	Rodante et al., 2025	Questionnaire			✔	
	Emotions of professionals when caring for suicidal patients (emotional skills)	Bender et al. 2021	Questionnaire	✔			+
	Training needs concerning the assessment of people in suicidal crisis and the safety plan (e.g., be familiar with suicide risk assessment models) (Stewart et al., 2020) ; (e.g., identification of warning signs) (Rodante et al., 2025)	Stewart et al. 2020	Questionnaire	✔			
		Rodante et al., 2025	Questionnaire	✔			
Training-related assessment variable	Training satisfaction	Stewart et al. 2020	Questionnaire		✔		
		Price et al.2022	Debriefing with the trainer		✔		
		Rodante et al., 2025	Questionnaire		✔	✔	

✔: assessment, +: trend in improvement, -: trend in decrease, =: no change.

4.4. Training assessment criteria

Two categories of variables were assessed in the four studies: those related to the determinants of behavioral change and those related to satisfaction with the training (Table 4). In three studies, the multidimensional factors influencing behavioral change were assessed (Bender et al., 2021; Stewart et al., 2020). Also two study were focused only on the attitudes of the participants (Price et al., 2022).

4.5. Impact of the training and satisfaction

Impact immediately after training

Overall, the included studies provided converging evidence of immediate post-training benefits across multiple domains.

In a study including 95 participants, knowledge seemed to improve with training, increasing from a mean of 3.45, SD: 2.35 before training to 5.98, SD: 2.92 immediately after training (difference not shown, $p < 0.0001$) when measured on a scale of 1 to 20 (Bender et al., 2021).

In terms of behavioral outcomes, attitudes regarding suicide prevention, measured with the Attitude to Suicide Prevention Scale, appeared to improve after training in another study of 490 participants (data not shown, $p = 0.035$) (Price et al., 2022).

In the study by Bender et al., perceived behavioral control also seemed to increase after training (3.91, SD: 0.45 before vs. 4.43, SD: 0.52 after training, difference not shown, $p < 0.0001$), as did the intention to use the good practice elements of the safety plan (4.25, SD: 0.48 before vs. 4.53, SD: 0.50 after training, difference not shown, $p < 0.0001$) (Bender et al., 2021). Bender et al. reported greater intentions to use safety plans in daily practice from pretraining to posttraining (4.25, SD: 0.48 vs. 4.53, SD: 0.50, $p < 0.0001$) (Bender et al., 2021).

In contrast, concern about suicidal patients in Rodante study was not reduced after training (3.99, SD: 1.14 before vs. 4.32, SD: 0.78 after training, difference not shown, $p = 0.34$), but participants reported a greater perception that they could improve patients safety (2.3, SD: 0.96 before vs. 1.76, SD: 0.76 after training, $p < 0.01$) (Rodante et al., 2025).

In the same study, the confidence in having the clinical tools needed to manage patients' suicidality (2.61, SD: 0.89 pre training vs. 3.56, SD: 0.63 post training, $p < 0.001$) and to prevent outpatient suicide attempts (2.32, SD: 0.93 pre training vs. 1.9, SD: 0.83 post training, $p < 0.01$) increased (Rodante et al., 2025).

Midterm impact

At 6 months posttraining, a decrease in knowledge and perceived behavioral control was observed in this study compared with the immediate posttraining assessment (4.08, SD: 2.77 at 6 months vs. 5.98, SD: 2.92, difference not shown, $p < 0.001$ and 4.15, SD: 0.45 at 6 months vs. 4.43, SD: 0.52, $p < 0.0001$, respectively) (Bender et al., 2021). However, perceived behavioral control remained improved at 6 months compared with the pretraining assessment (4.15, SD: 0.45 at 6 months vs. 3.91, SD: 0.45, $p < 0.001$) in this study. A subgroup analysis of participants (27/48; 56%) who reported encountering at least one suicidal client during the follow-up period of 6 months revealed a potential improvement in participants' safety planning behaviour at 6 months compared with the pretraining assessment (3.51, SD: 0.95 at 6 months vs. 2.84, SD: 1.21, $p < 0.05$).

Attitudes towards safety planning seemed to improve at follow-up in two studies. Bender et al. reported that attitudes towards safety planning improved at 6 months compared with pretraining (3.90, SD: 0.55 vs. 3.77, SD: 0.6, $p = 0.013$) (Bender et al., 2021).

Participants in the Rodante study improved their capacity to help patients to create a safety plan (2.58, SD: 0.91 before vs. 3.84, SD: 0.57 at 8 weeks, $p < 0001$) and felt well prepared to use the SPI (3.53, SD: 0.61 after training vs. 3.63, SD: 0.72 at 8 weeks, difference not shown) (Rodante et al., 2025).

At 10 weeks after training, Stewart et al. (2020) reported a trend towards improvement in participants' confidence in their ability to implement a safety plan, increasing from 4.19, SD: 0.75 pretraining to 4.38, SD: 0.74 (measured on a scale of 1 to 5) for the item "I am confident in my ability to further assess a patient's suicide risk severity" and from 4.29, SD: 0.53 to 4.38, SD: 0.75 for the item "I am confident in my ability to help clients at risk for suicide create a personalized safety plan" (Stewart et al., 2020). For all participants in Benders' study, there was an improvement in positive emotions at 6 months compared with pretraining (3.75, SD: 0.67 at 6 months vs. 3.42, SD: 0.91, $p < 0.001$) (Bender et al., 2021).

Safety planning behaviour after training also seemed positive in the same study. Six out of 11 participants had completed a safety plan at least once in the ten weeks after training, with a total of 18 safety plans completed (Stewart et al., 2020). Aligned findings were reported in the Rodante study, where 58.1% ($n = 25$) of participants indicated using the SPI. Participants did not feel that the implementation represented additional work (1.61, SD: 0.77) (Rodante et al., 2025).

In the Bender et al. study, behaviors towards the safety plan improved in a subpopulation of individuals who had encountered a suicidal patient between pre- and posttraining (2.84, SD: 1.21 vs. 3.51, SD: 0.95, $p < 0.05$) (Bender et al., 2021).

Participants' satisfaction

In three studies, participant satisfaction after training was evaluated. In Price et al.'s (2022) study, perceptions were positive. Following role play, the participants were confident in their ability to complete the safety plan independently. In the Stewart et al. (2020) study, 11 out of 12 participants found the training useful, learned from the training and planned to use the safety plan. Similar trends were observed in the Rodante study, where the participants identified the safety plan intervention as useful in crisis situations at 8 weeks (Rodante et al., 2025). Role-playing based on observation and/or practice and learning the structure of the safety plan were the most useful elements mentioned by 4 out of 10 participants. Learning a specific vocabulary for implementing the safety plan was described as the most difficult element for 20% of the participants. One participant regretted the lack of training in suicide risk assessment (Stewart et al., 2020). Finally, the positive reinforcement used by the trainers was identified as important by the

participants (Bender et al., 2021; Stewart et al., 2020).

5. Discussion

5.1. Summary of results

The training of healthcare professionals on the use of safety plans is a lever for action to support people in suicidal crises and improve the quality of care. During the 17-year review period and excluding training using e-learning, a safety plan training program was described in only four studies. In all these studies, training courses were short, theory preceded practice, and evaluation criteria were heterogeneous. Multiple determinants of behavior, including knowledge, attitudes, perceived behavioral control, intentions, emotions and behaviour, appeared to improve immediately after training or at mid-term. Only knowledge seemed to decrease at 6 months after training in one study.

One study was focused on the training needs of healthcare professionals in suicidal crises, with a particular focus on technical and communication difficulties and family support, and most staff expressed that it was necessary and essential to have the training plan (Rothes et al., 2014).

5.2. Discussion of results

Several indicators related to the participants or the training must be considered in a comprehensive evaluation of a safety plan training program. In the studies included in this review, there was heterogeneity in the definition and choice of these variables. On the basis of the training evaluation model developed by D. Kirkpatrick, three of the four levels identified are present: participants' reactions (or satisfaction), learning (related to attitudes, knowledge and skills) and changes in behaviour following training (Kirkpatrick and Kirkpatrick, 2006). In a systematic review, Ferguson et al. confirmed that knowledge, skills and attitudes are the variables most commonly evaluated in suicide prevention training for nurses (Ferguson et al., 2021). In our search, we identified two longitudinal studies (Bender et al., 2021; Stewart et al., 2020), one of which (Stewart et al., 2020) revealed a reduction in knowledge after three months. It seems pertinent to conduct longitudinal evaluations of the impact of training.

In our review, improvements in several determinants of behaviour were observed after training or at mid-term. However, a decrease in knowledge at six months and a decrease in perceived behavioral control were also observed, which are subjects of interest (Bender et al., 2021). Maintaining knowledge is a challenge that is shared with other health contexts facing a decline in knowledge (Kishimoto et al., 2024). As highlighted in the work of Legoux et al. there is a clear need to organize updating strategies to facilitate the retention of knowledge. The modalities of these sessions will have to be adapted to the constraints of healthcare professionals (Legoux et al., 2020), in this context, training reminders, especially in an online format, may represent the start of a solution.

The objectives of the safety plan training were not entirely consistent across the studies included in this review. Although improvements in knowledge and skills were sought in all three studies, there was a paucity of exploration into specific objectives, such as improving attitudes and emotional reactions. In only one study was detailed information regarding the specific objectives of the training program provided (Bender et al., 2021). Therefore, there appears to be a need for greater standardization of expectations and objectives for safety plan training. The measurement of the needs of professionals through a pretest phase was performed in only one study, but this approach seems to be a valuable tool for the adaptation of training programs.

The structure of the training content was consistent across the studies included in this review. This structure comprised two principal phases: a didactic phase and a practical phase involving role-playing. A preference for the face-to-face method was indicated in the selected studies. These two phases (theoretical and practical) are also evident in e-learning safety plan training, which provides feedback during virtual simulations (Darnell et al., 2021). In the general context of health care, educational meetings are widely used by health care professionals. A Cochrane systematic review comprising 215 studies on the effects of education meetings on professional practice and health care outcomes revealed that two-dimensional, didactic and interactive training courses were more effective than no training, didactic training only or interactive training only (Forsetlund et al., 2021).

A meta-analysis on the impact of learning (not specific to the suicidal context) carried out by an online versus face-to-face modality with nursing students did not reveal any differences in terms of knowledge and satisfaction (Lahti et al., 2014). In another recent meta-analysis, suicide crisis training via simulation was evaluated; training via simulation was not included in the scope of this review, but this method is promising and raises questions about the ways in which role-playing is used in safety plan training (Richard et al., 2023). A recent study of 36 health care professionals dedicated to safety plan training was based on a mixed training module comprising virtual pre-implementation training followed by face-to-face training. The authors concluded that the feeling of personal control was maintained and that there was a tendency for knowledge to improve at 6 months posttraining (Whitmyre et al., 2024).

Our review revealed that all the trainers recruited were experts in the field of suicide prevention, which ensures a certain level of competence. This finding is in line with the recommendations developed by Kirkpatrick on trainer expertise (Kirkpatrick and Kirkpatrick, 2006).

There are potential barriers to the implementation of training in clinical settings. Ensuring that professionals are available to attend training sessions during working hours, as outlined in the review, is one prerequisite, which more generally underlines the need for hierarchical and institutional support for the successful completion of this type of training (Stewart et al., 2020). Freeing working time for training on safety plans was also an issue raised in another qualitative study on the use of an e-learning training module by nurses (Darnell et al., 2023). The integration of novel evidence-based practices and their incorporation into routine care represents a significant challenge for implementation science. There is considerable potential for such integration to enhance the quality of care for

individuals with mental health concerns (Proctor et al., 2009).

This study highlights the importance of improving knowledge of the impact of safety plan training for nurses and other professionals and of optimizing training schemes with the goal of making them more widespread for professionals involved in the implementation of these plans.

5.3. Limitations

The limitations of this review include the selection of databases, a defined search strategy resulting in a limited number of included studies, the methodological quality of the studies and their small sample sizes. These factors limit the generalizability and scope of the results.

The majority of the studies were conducted in the United States where suicide mortality trends have risen over the period 2000–2019, in contrast to the global trends (Ilic and Ilic, 2022). In light of these circumstances, the Joint Commission and the Suicide Prevention Resource Centre have recommended the implementation of safety plans in the United States since 2019 and have taken measures to ensure the availability of these plans, which reinforces the value of updating this review. The generalizability of the results to other international contexts is constrained by the variations in the national configuration of healthcare systems, as well as by the disparities in the education and training of healthcare professionals.

The populations, evaluation criteria and methodologies were heterogeneous. Furthermore, the content, duration, trainers and tools used to evaluate the training also varied. The subject matter is original and is likely to prompt further research into this novel topic.

Nurses were poorly represented in the included studies, even though they are particularly concerned with the implementation of the safety plan intervention. In addition, the safety plan may be of interest for patient care planning. Further research is needed to adapt training courses as closely as possible to the needs of health care professionals and individuals throughout the care pathway.

In the selected studies, the theoretical components of the program are poorly described, as are the role-plays. These limitations give rise to issues concerning the comparability of the interventions. The review did not include the training program using simulations. Despite the problems with putting these programs into implementation, particularly the simulation rooms, knowledge is likely to be gained from these experiments and should be included in new syntheses of the literature on this topic.

Future research should include a wide range of healthcare professionals, especially nurses, but also offer a qualitative approach that may take into account grey literature. Researchers should investigate a wide range of training modalities (e.g., face-to-face, blended, videoconferencing, and e-learning). Finally, it is imperative that longitudinal studies are conducted to explore skills retention.

6. Conclusion

This review highlights the common base for safety plan training, which is a short module including parts on theory and role play. The findings of the studies included suggested that, after training, knowledge, attitudes towards managing people in a suicidal crisis, perceived behavioral control, intentions to use the safety plan, emotions and behaviors towards the safety plan improved. Knowledge improved in the immediate posttraining period but seemed to decrease at 6 months posttraining. This study highlights the importance of evaluating the impact of safety plan training for nurses and other professionals to facilitate the dissemination and implementation of these plans.

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Contact corresponding author.

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CRediT authorship contribution statement

Benoit Chalancon: Conceptualization, Formal analysis, Investigation, Methodology, Project administration, Writing – original draft, Writing – review & editing. **Aurélie Vacher:** Conceptualization, Formal analysis, Investigation, Methodology, Writing – original draft, Writing – review & editing. **Edouard Leaune:** Methodology, Writing – review & editing. **Maxime Vieux:** Writing – review & editing. **Emmanuel Poulet:** Supervision, Writing – review & editing. **Judith Leblanc:** Writing – review & editing, Writing – original draft, Validation, Supervision, Methodology.

Declaration of competing interest

None.

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Supplementary materials

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