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SYSTEMATIC REVIEW

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Psychosocial interventions for self-harm and suicide prevention in liaison psychiatry: an overview of systematic reviews

Leah Quinlivan[1,2,3*], Jodie Westhead[1,2,3], Jane Graney[1,2,3], Fanyi Su[3], Sarah Steeg[1,2,3], Emma Nielsen[3], Eloise Curtis[3], Ellie Wildbore[3], Faraz Mughal[3,4,5], Rachel Elliott[3], Roger T. Webb[1,2,3] and Nav Kapur[1,2,3,6]

Abstract

Background Liaison psychiatry services play a central role in self-harm care and suicide prevention by providing specialist mental health input in general hospitals. Psychosocial interventions, including brief contact approaches (e.g., safety plans) and longer-term structured therapies (e.g., cognitive-behaviour therapy [CBT], dialectical behaviour therapy [CBT]), may reduce self-harm and suicide risk but their relevance and effectiveness within liaison psychiatry settings remains unclear.

Aims To synthesise systematic evidence review on psychosocial interventions for preventing self-harm and suicide in liaison psychiatry settings through an umbrella review.

Methods We searched Medline, Embase, CINAHL, PsycInfo, and CDSR (2013–2023) for systematic reviews evaluating interventions in liaison psychiatry contexts (including emergency departments, wards in general hospitals, outpatient/follow-up clinics for acute care patients receiving treatment for self-harm/suicidal behaviour), in adults or mixed adult/adolescent populations. Review quality (AMSTAR-2), primary study overlap in reviews, and evidence certainty (adapted GRADE) were assessed. Findings were narratively synthesised and tabulated, with input from experts-by-experience throughout. PROSPERO: CRD42023442639.

Results Twenty-three systematic reviews (including 12 meta-analyses; >450,000 participants), were included. Person-centred brief contact interventions, particularly those incorporating safety planning and follow-up, were most consistently associated with reduced suicide attempt rates. However, methodological limitations including heterogeneity, limited generalisability, lack of self-harm specific outcomes, and mixed findings for remote only contact interventions warrant cautious interpretation. For longer-term psychological therapies, CBT was associated with reduced repeat self-harm, particularly with longer follow-up, whereas DBT reduced the rate of repetition. Evidence was limited by the lack of setting-specific trials, limited patient involvement, and suboptimal quality trials. Review quality varied. Primary trial overlap was slight overall, but high for some pairs of reviews of brief interventions.

*Correspondence:
Leah Quinlivan
leah.quinlivan@manchester.ac.uk

Full list of author information is available at the end of the article

Conclusion Current evidence for self-harm and suicide prevention interventions in liaison psychiatry services is methodologically suboptimal. Given widescale implementation of psychosocial interventions, there is an urgent priority to ensure they are safe, effective, and acceptable within liaison psychiatry services.

Keywords Self-harm, Suicide, Therapeutic interventions, Health services, Umbrella review

Introduction

Self-harm, defined as intentional self-injury or self-poisoning [1] is a common reason for hospital presentation and is associated with an increased risk of early death [2–4]. Hospital care for people who have self-harmed varies in delivery, capacity, and resources, and has transformed rapidly over the last decade [5–7]. In the UK and elsewhere, liaison psychiatry teams, comprised of multidisciplinary staff, skilled in the treatment of co-occurring physical and mental health concerns, provide specialist support for patients who have presented to acute general hospital with self-harm or suicidal behaviours [5–9]. In the United Kingdom, (UK) liaison psychiatry services range from smaller teams with minimum staffing and skills mix, to comprehensive/enhanced services that offer 24/7 support in emergency department and ward settings [6, 7]. Larger comprehensive services may have access to a broader staff mix, including specialist practitioners, consultant psychiatrists, clinical psychologists, and may also offer specialist outpatient clinics [6, 7]. The type, depth, and duration of interventions vary on whether care is provided in emergency departments, hospital wards, or outpatient clinics. Typically, general hospital staff provide initial assessments for people who have self-harmed and refer to mental health staff for more comprehensive assessments and aftercare [5]. Environments are often not ideal for mental health assessments; demand and staff turnover are high, time is short, and patient case mix is diverse [10–13].

Whilst clinical guidelines recommend psychosocial assessments and psychological therapy to mitigate self-harm repetition and suicide risk [1], access is frequently inadequate [10–12]. Clinicians report uncertainty over which therapeutic interventions work for whom and where [10–12]. Evaluating relevant psychosocial interventions for liaison psychiatry services is further complicated by clinical demands, and poor translation of intervention evidence to real-world clinical practice [13].

Systematic reviews represent gold standard in evidence synthesis [14, 15]. However, the publication of variable quality reviews is rapidly increasing, which has implications when utilising this evidence for high-demand clinical practice [14, 15].

Umbrella reviews provide an opportunity to synthesise evidence reported from multiple published systematic reviews to inform clinical practice, policy, and patients [14, 15]. In this umbrella review, our aim was to systematically identify and synthesise data from published systematic reviews and meta-analyses that have reported on interventions relevant to liaison psychiatry. Unlike previous cross-setting reviews, which aggregate primary studies from a range of healthcare settings, our novel approach provides a consolidated and comparative evaluation of the systematic review evidence, specifically as it pertains to liaison psychiatry practice.

Methods

This study is reported according to the Preferred Reported Items for Overviews of Reviews (PRIOR) guideline [16], and was registered on the International Prospective Register of Systematic Reviews (PROSPERO) [registration number: CRD42023442639; 5.06.23]. Minor changes included utilising the Adapted Algorithm for GRADE [17], in place of Guyatt et al. [18] to evaluate methodological quality and certainty of the evidence.

Patient and public involvement

People with lived/living experience were involved throughout the research process, are co-authors on this paper, and have completed a lived experience companion paper based on the findings.

Inclusion and exclusion criteria

Reviews were eligible for inclusion if they were: (1) peer reviewed systematic reviews; (2) they included at least one primary study that evaluated therapeutic interventions for self-harm and or suicide prevention in liaison psychiatry settings (e.g., emergency departments, psychiatric wards in general hospital wards, wards in general hospitals and outpatients/follow-up clinics for people who have presented to hospital for self-harm or suicidal behaviour). Liaison psychiatry outpatient clinics are typically managed by mental health trust staff, sometimes in partnership with the acute trust, and are located within or near to the acute general hospital; (see Table 1 for definitions of interventions, comparators and outcomes); (3) reported data for adults aged 18 or over, or composite results for adults and adolescents.

Our outcome definitions are consistent with clinical guidelines for self-harm [1], and included any self-harm, or self-injury irrespective of suicidal intent (See Table 1). Suicidal ideation, whilst important, was excluded due to our focus on behavior [19, 20]. We set no restrictions on study designs, comparators, history of self-harm, or

Table 1 PICO* (population, intervention, comparison, and outcomes) criteria

Population	Patients at risk of self-harm or suicide in liaison psychiatry settings.
Setting	Emergency departments, general hospital wards, mental health wards/beds in general hospitals, liaison psychiatry outpatient or follow-up clinics.
Intervention	Psychosocial or psychological interventions: Interventions in systematic reviews included, but were not limited to the following: *Brief contact interventions*: (e.g., safety planning, single-session psychosocial support, crisis management), typically delivered in outpatient or acute care settings in one to four sessions. *Structured psychological therapies*: (e.g., CBT, DBT), delivered over multiple sessions, often in outpatient or follow-up clinic settings. Other interventions: mentalisation-based therapy; case management; group-based psychotherapy; brief contact interventions, enhanced assessment approaches; treatment adherence; family interventions; remote contact interventions; and other multimodal interventions. Models of care interventions: specialist self-harm teams, assessment and intervention by the same team, mental health care-led teams, integrated care/seamless transition services. Training: Any self-harm or suicide prevention training for staff working across all three settings, reporting self-harm and/or suicide as outcomes.
Comparison	Psychosocial or psychological therapy comparisons: Routine/standard care (e.g., treatment as usual), any other comparator or none (e.g., pre-post designs). Models of care comparisons: generic models of care, assessment and intervention provided by different teams. Staff training: No training, usual practice.
Outcome	Self-harm, defined as any intentional act of self-poisoning or self-injury, irrespective of suicidal intent or motivation. This definition also includes attempted suicide and non-suicidal self-injury, because suicidal intent varies within and between episodes. Irrespective of suicidal intent, self-harm is a major risk factor for subsequent adverse events, including suicide. Consistent with the Office of National Statistics, suicide is defined as any death caused by intentional self-harm with or without suicidal intent, or of undetermined intent (ICD-10 codes: X60-X84, Y10-Y34, Y87.2).

*PICO categories were based on clinical guidelines for self-harm [1]

psychiatric diagnoses. Exclusion criteria included: (1) evaluating pharmacological or environmental interventions either combined psychosocial treatments or individually against treatment as usual; (2) suicidal ideation (as composite or main outcome); (3) studies that only reported data for children and adolescents; (4) studies based in criminal justice, educational, community, mental health inpatient settings (i.e., those in mental health inpatient units rather than general hospitals), or voluntary settings, reviews; (5) theoretical and opinion-based reviews, letters, commentaries, non-systematic reviews, reviews of qualitative research; and (6) review articles that were not translated to English.

Search strategy and selection criteria

Search strategy details including terms, reference lists, and reasons for exclusion are in the supplementary materials, Table 1. We searched Embase, PsycInfo, MEDLINE, CINAHL, and the Cochrane Database of Systematic Reviews (CDSR) from January 2013 to December 2023, using broad search strings to capture reviews in this area (see supplementary materials). Search terms were developed with a specialist librarian and adapted from clinical guidelines and Cochrane Reviews of interventions for self-harm [1, 21]. We used forward and backward citation chaining and content expert knowledge to supplement database searches. Two reviewers (LQ, JW) independently reviewed all titles, abstracts, and full texts of potentially eligible studies, FM checked a random 10%, and JG cross-checked 100% of data extracted. Disagreements were resolved via consensus and discussion with senior authors (RW, NK, RE), and the wider team (FM, JW, FS).

Data extraction

LQ and JW independently extracted data, which was verified (JG, FM), and reviewed by a multidisciplinary team. We extracted study characteristics, including author details, population, author defined interventions, comparison, and outcome (PICO), methods, evaluation of bias, heterogeneity, GRADE assessment, results, and if there was any reported patient involvement.

Quality assessment

Two researchers (LQ, JW) independently evaluated the methodological quality of systematic reviews using the Assessment of Multiple Systematic Reviews Tool (AMSTAR-2) [22]. Each of the 16 items is evaluated as either positive (yes), negative (no), or partial positive. We classified reviews as providing 'high', 'moderate', 'low', and 'critically low' quality evidence based on seven 'critical' and nine 'non-critical' domains. For example, reviews that listed summary justifications for excluded references in a flow chart, but did not supply a list of references and individual reasons, were marked as No (critical domain). Reviews with a partial yes, or that did not report data for the AMSTAR 2 [22] item were classified as 'No' for domain classifications.

As part of evidence evaluation, we tabulated and synthesised data for the Adapted GRADE algorithm [17] and other key methodological data. For the adapted GRADE algorithm, quantitative reviews received downgrades based on the assessment of methodological quality, via heterogeneity, number of participants, risk of bias, and items from AMSTAR-2 [17, 22]. Quantitative reviews were rated as providing a high level of evidence if they have received zero downgrades, moderate if one or two

downgrades, low if three or four downgrades, and very low if the review received five or six downgrades [22]. We also report any use of GRADE evaluations [18] in reviews. We based our conclusions on the combined evidence from quantitative and narrative reviews.

Overlap analysis

We estimated the degree of the primary studies pairwise overlap in the reviews via the Covered Area (CA; formula: *N/rc*) and corrected covered area (CCA; formula: $(N- r)/((r*c)- r)$) using the open-access Graphical Representation of Overlap for OVErviews open-access tool [23, 24]. 'N' is the total number of publications, '*r*' is the total number of rows (primary studies), and 'c', the total number of columns (included reviews). Results are categorised as slight (CCA 0–5%), moderate (CCA 6–10%), high (CCA 11–15%) and very high overlap (CCA > 15%) [23, 24]. One study was removed from the overlap analyses due to insufficient information for the extraction of primary studies references [25].

Synthesis methods

Given the high degree of heterogeneity across the set of reviews, we used a systematic approach to narratively describe and synthesise the data in tables and groups [26]. We grouped systematic review results into those with quantitative (meta-analysis) and narrative synthesis analysis. We summarised the findings from the two groups separately and reported results and outcomes as described by the review. We report detailed results for interventions with evidence of effects on relevant outcomes, report contradictory findings, and summarise the interventions without supportive evidence.

For quantitative reviews (meta-analyses), we report important parameters for significant results including pooled odds ratios (*OR*) for dichotomous outcomes, such as the number of participants that repeat self-harm or die by suicide, mean differences (*MD*) for quantitative outcomes, such as the frequency of repeated self-harm episodes, confidence intervals (95%CI), means *(M)*, and standard deviations (*SD*) where available. We report the I^2 statistic as a measure of between-study variation and heterogeneity [27]. Outcomes were classified into self-harm, attempted suicide, and suicide; based on the information available in the publication. Interventions are reported as defined by the systematic reviews.

Results

Figure 1 summarises the results of the search, which yielded 1116 studies, of which, 1041 were excluded at the title and abstract screening stage. We screened 74 for full text eligibility and identified 23 additional studies through manual searches. In total, after full text screening and stratification, 31 reviews included relevant data for healthcare settings, and 23 met our inclusion criteria for liaison psychiatry settings (see Fig. 1 for the search flow chart).

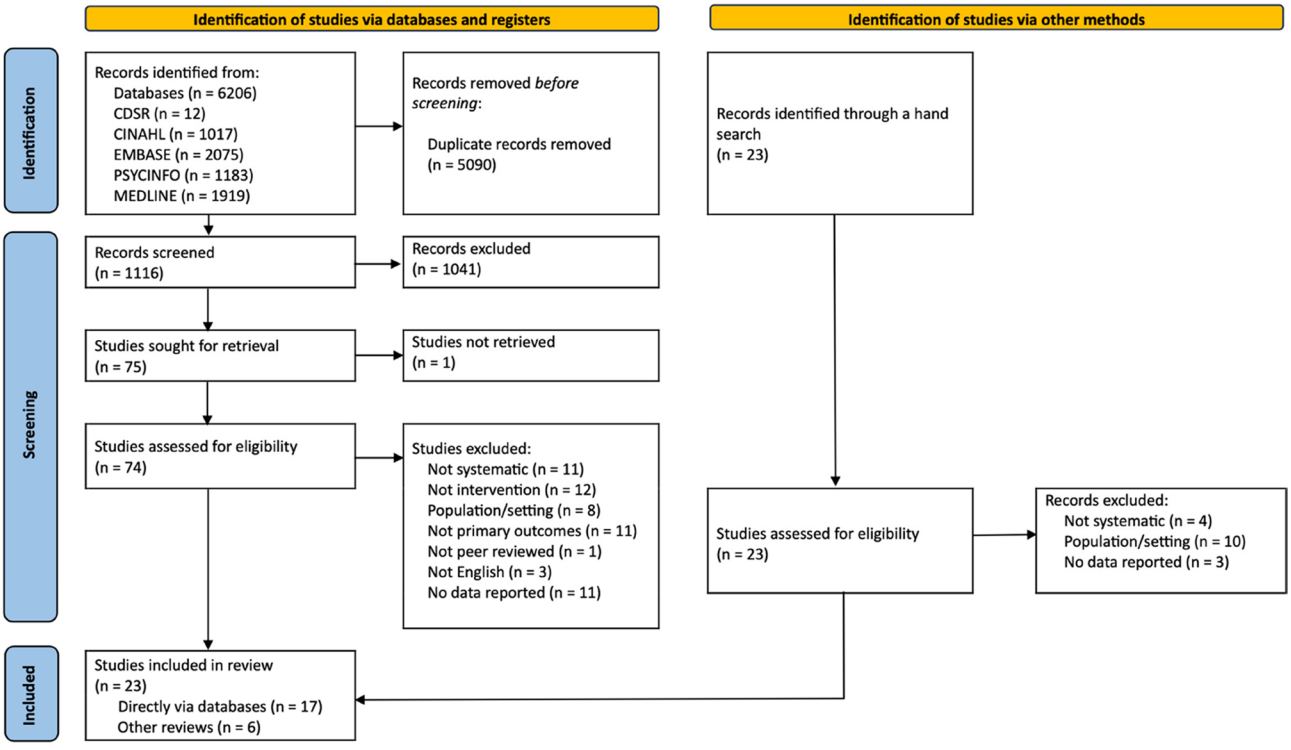

Fig. 1 Flow diagram for the search strategy

Evaluation of bias in reviews

Thirteen studies used the Cochrane Risk of Bias Tool [21, 28–39], six used another method of evaluating bias (e.g., Joanna Briggs appraisal tool) [25, 35–44], and four did not report information [45–48]. Predominant concerns for bias included participant attrition, incomplete outcome data, and blinding (see Table 2).

Assessment of the reviews' methodological quality and certainty of the evidence

AMSTAR-2 [22] assessments for the included reviews are presented in Table 4. Methodological quality varied widely across reviews: Two reviews did not have any critical or non-critical flaws and were rated as providing a 'high quality' summary of the results and available data [21, 34]. Three reviews were rated as 'low', due to one critical flaw (e.g., did not list excluded study references individually) [29, 30, 32], with the remainder rated as 'critically low' quality due to more than one critical flaw (e.g., lack of pre-registration, excluded studies, comprehensive strategy) (Table 4). Most reviews (21/23) received a critical flaw due to item 5 (reference list with justifications for each excluded study); 18/23 received a critical flaw for receiving a partial yes for conducting a comprehensive search strategy (e.g., they may not have reported searching reference lists, trial registries or including content experts), and 13/23 did not pre-register the review (Table 4).

Two systematic reviews [21, 34] evaluated the certainty of the evidence according to GRADE [18]. In the updated Cochrane review to Hawton et al. [34, 49] Witt et al. [21] rated most trials as 'very low' to 'moderate' quality according to GRADE. Trials for cognitive-behaviour therapy to reduce self-harm repetition received a GRADE [18] rating of 'low' certainty evidence, and 'very low' quality for DBT. Mentalisation-based therapy was rated has having 'high' certainty evidence for reducing self-harm repetition, but this was based on a single trial. Two trials for group-based emotion regulation psychotherapy received a 'moderate' certainty evidence rating for reducing self-harm repetition [21]. One review [40] adapted GRADE [18] to evaluate the methodological quality of trials, but did not report the certainty of evidence. Given the quality of trials in this area, according to the Adapted Grade Algorithm scoring [17], no reviews provided a 'high' certainty of evidence for the effectiveness of psychosocial interventions for self-harm or suicide prevention. Additional information pertaining to the methodological evaluation of reviews (e.g., combinations of the adapted algorithm for GRADE [17] and AMSTAR-2 [22] is presented in Tables 2, 3 and 4.

Characteristics of included studies

Characteristics of the included reviews (e.g., including interventions, outcomes, comparators, bias, heterogeneity), are presented in Table 5. Systematic reviews were published between 2013 and 2023. The 1106 primary studies dated from 1970 to 2022, with a total of 464,759 participants. Most reviews reported data for adults (12/23), 9/23 reported composite data for adults and adolescents, and two reviews had insufficient reporting for age (Table 5). Percentage of female participants in the included primary studies ranged from 11 to 90%, and 10/23 had insufficient reporting for gender (Table 5). Four quantitative [21, 25, 34, 45] and four narrative reviews included self-harm in their outcomes [32, 42, 46, 48]. Eight quantitative [21, 25, 31, 33–35, 38, 40] and eight narrative reviews included suicide re-attempts [28, 30, 36, 41, 43, 44, 47, 48]. Four quantitative reviews utilised a composite outcome of suicide and suicide attempts [29, 37, 39, 45]. Three quantitative [31, 37, 39] and one qualitative review excluded self-harm [35].

Twelve reviews conducted meta-analyses [21, 25, 29, 31, 33–35, 37, 39, 40, 45] and 11 narratively summarised the data [28, 30, 32, 36, 41–44, 46, 48]. Arshad et al. [32] conducted a meta-analysis for suicidal ideation, but a narrative review for suicide attempts. There was no reported patient involvement across reviews.

Quantitative reviews: effectiveness

Brief contact interventions

Brief contact interventions are low-cost, non-intrusive interventions that aim to mitigate risks of self-harm repetition and suicide for people presenting to hospital following a self-harm episode or with elevated suicide risk [28–30, 33]. Interventions vary in format and delivery, but may include brief therapeutic interventions (e.g., safety planning), with or without regular follow-up through telephone calls, messages, letters, texts, or postcards. Eight quantitative reviews included brief contact interventions in their analyses [21, 29, 31, 33–35, 40].

Mixed brief contact interventions

Azizi et al. [40] pooled results from 19 RCTs evaluating brief contact interventions for patients who made a first-time suicide attempt. Intervention contact with patients was brief (e.g., provision of telephone calls, messages, letters, texts, postcards, psychoeducation, crisis cards), and follow-up length was split into those receiving follow-up contacts for more or less than 12 months. Analyses indicated that pooled interventions reduced repeated suicide attempts compared to controls (risk difference estimate: RD = 4%, 95%CI [2–6%]; $I^2 = 68.9$; risk ratio:

Table 2 Quality evaluation using the adapted algorithm for GRADE [17], AMSTAR2 [22] ROB, and heterogeneity

Citation	AMSTAR			Total number of participants Pooled meta-analysis	RoB (Bias and trial quality)	Heterogeneity evaluated	Amstar Ranking	Level of evidence/and generalisability factors
	Registered protocol	Comprehensive search strategy	Duplicate extraction					
Witt [21]	Yes	Yes	Yes	CBT vs. TAU post intervention: Repeat self-harm = 4 trials, *n* = 238; 6-month follow-up = 9 trials, *n* = 2458; 12 months: 9 trials, *n* = 2458; CBT vs. TAU or alternative therapy, frequency of self-harm by post intervention: *n* = 659; Emotion-regulation psychotherapy (ERP) vs. TAU: 2 trials, *n* = 83. Mentalisation based-therapy (MBT) vs. TAU reducing repeat self-harm by 18 months and the frequency of self-harm: one trial, *n* = 63.	CROB: Most trials rated as having some or high risk of bias (84.2%). Predominate concerns related to the selection of the reported result and measurement if the outcome.	Yes (low).	High	Downgraded 1 for trial quality (moderate evidence based on trial quality). *Author GRADE evaluations for significant results*: CBT vs. TAU: low certainty evidence; DBT vs. TAU: very low certainty evidence; Emotion regulation therapy (post intervention reduction in repetition and frequency of self-harm): Moderate certainty; MBT (post intervention reduction in repetition and frequency of self-harm): high certainty (1 trial).
Hawton [34, 49]	Yes	Yes	Yes	CBT vs. TAU self-harm repetition by 6 months: *n* = 1317; CBT vs. TAU 12mths: *n* = 2232; Suicide final follow-up: 2354; DBT: self-harm repetition post; intervention: 173; DBT: self-harm repetition *n* = 12 months: *n* = 77; DBT: suicide: *n* = 317.	CROB: Risks included performance bias. Quality of evidence was moderate to very low, biases typically related to blinding, which is challenging in psychosocial interventions.	Yes (ranged from low to 51%).	High	Downgraded 1 for trial quality (moderate evidence based on trial quality). *Author GRADE evaluations for significant results*: CBT vs. TAU: low certainty evidence; Emotion regulation therapy vs. TAU: low certainty; DBT vs. TAU or alternative: low certainty evidence.
Nuij [29]	Yes	Yes	Yes	3536	CROB-2: One study had low risk of bias, one moderate, and four had high risk of bias. Bias related to randomisation, deviation from intervention, outcome measurement.	Yes (Low).	Low	Downgraded 1 for trial quality.
Sobanski [39]	No	Partial	No	CBT: *n* = 961 Problem-solving: *n* = 474 Psychodynamic: *n* = 253 DBT: *n* = 256	CROB: Potential for publication bias and other biases across studies (e.g., blinding, incomplete outcome data, detection bias, and other bias).	Yes (low-moderate).	Critically low	Downgraded 1 for trial quality; Downgraded 3 for AMSTAR (4 total downgrades).
Hofstra [31]	Yes	Partial	Yes	29,071	CROB (ROBNS-I) varied, substantial number of studies with serious ROB. 2/16 studies had low risk of bias, 9 moderate, 5 had serious risk of bias. (e.g., confounding, selection, missing data).	Yes (Suicide: $I^2 = 0\%$, attempted suicide, $I^2 = 62\%$.).	Critically low	Downgraded 1 for trial quality. Downgraded 1 for AMSTAR (2 total downgrades).

Table 2 (continued)

Citation	AMSTAR							
	Registered protocol	Comprehensive search strategy	Duplicate extraction	Total number of participants Pooled meta-analysis	RoB (Bias and trial quality)	Heterogeneity evaluated	Amstar Ranking	Level of evidence/and generalisability factors
Hou [35]	No	Partial	Yes	Insufficient information.	CROB, 5 studies classified as high risk, predominately due to incomplete outcome data or blinding of outcome assessment.	Yes (Suicide: $I^2=17\%$, attempted suicide; $I^2=52\%$).	Critically low	Downgraded 1 for trial quality; Downgraded 2 for AMSTAR (3 total downgrades).
Meerwijk [37]	Yes	Partial	Yes	6658	CROB. Largest source of bias was from incomplete data due to attrition (more than 50% of studies), other bias included poor reporting for potential performance bias, and selective reporting.	Yes (No substantial heterogeneity).	Critically low	Downgraded 1 for trial quality and 1 for AMSTAR (2 total downgrades).
Doupnik [33]	Yes	Partial	Yes	4270	CROB, most common bias was incomplete outcome data.	Yes (No significant heterogeneity for suicide attempts).	Critically low	Downgraded 1 for trial quality and 1 for AMSTAR (2 total downgrades).
Fox [25]	No	Partial	Yes	Reported effect sizes number (overall: $n=1186$, Suicide: $n=159$, suicide attempt: $n=209$ Non-suicidal self-injury: $n=46$; Self-harm: $n=73$) extracted from Table 1 [25]	Quality Assessment Tool for Quantitative Studies. Low for publication bias. More than half of the effect sizes (57.58%) were associated with weak study quality. More than a quarter of the effect sizes (36.21%) were from studies with moderate quality, with only 6.22% of the effect sizes from studies with strong quality. Bias included, selection bias, blinding).	Yes (low).	Critically low	Downgraded 2 (AMSTAR): Downgraded 1 for trial quality (3 total downgrades).
Azizi [40]	No	Partial	Yes	13,715	Used the modified Downs and Black checklist to model judgements against GRADE. 19 studies, 6/19 moderate or high risk, and the reminder low risk.	Yes ($I^2=68.9\%$ (Time: $I^2=80.3\%$ for more than 12 months, and 0% for less than 12 months).	Critically low	Downgraded 2 (AMSTAR) Downgraded 1 (heterogeneity) Downgraded 1 for trial quality (4 total downgrades).
DeCou [45]	No	Partial	No	$N=784$ (DBT)	Not reported.	Yes (low).	Critically low	Downgraded 3 (AMSTAR); 1 downgrade (bias). Downgraded 1 for trial quality (5 total downgrades).
Noh [38]	No	Partial	No	2099	CROB, mostly low risk of bias, one study had high risk of bias due to baseline differences in suicidal ideation between intervention and control groups.	Yes (No substantial heterogeneity).	Critically low	Downgraded 1 for trial quality. Downgraded21 for AMSTAR (3 total downgrades).

Adapted Grade scoring [17]: High = 0 downgrades, Moderate = 1 or 2 downgrades; Low = 3 or 4 downgrades; Very low = 5 or 6 downgrades (only applies to quantitative studies)

Abbreviations: *CBT* cognitive behavioural therapy, *CAT* Cognitive analytic therapy, *MBT* Mentalisation-based therapy, *DBT* dialectical behaviour therapy, *TAU* treatment as usual, *CPDpd* Cognitive behavioural therapy adapted for people who have received a personality disorder diagnosis, *CROB* Cochrane risk of bias tool

Table 3 Quality evaluation (Narrative), using AMSTAR [15], AMSTAR2 [20] ROB, and heterogeneity

Citation	Registered protocol	Comprehensive search strategy	Duplicate extraction	Synthesis	RoB (Bias and trial quality)	Heterogeneity evaluated	Amstar Ranking
Arshad [32]	Yes	Yes	Yes	Narrative for suicide attempts	CROB: 9/22 used single arm or pre-post designs. Wide variability; risk of detection bias high across all studies, 12 studies had high risk for selective reporting.	Heterogeneity in the discussion section for the effects of interventions and outcomes for attempted suicide.	Low
Zarska [41]	Yes	Partial	Yes	Narrative	Mixed Methods Appraisal Tool (MMAT); nine moderate quality studies. Only one RCT of moderate quality included in this review. The six studies that evaluated interventions were rated as good but no RCTs were included.	Diversity of studies mentioned in method section.	Low
Lengvenyte [36]	Yes	Partial	Yes	Narrative	CROB. Risk of bias was moderate to low, with most studies having some risk of bias for blinding, attrition, management of missing data. Most studies were pilots and only one had a reported power calculation.	Heterogeneity discussed in rationale for analyses for interventions, sample size, outcomes) and in discussion for quality of care, and outcome measurement.	Critically low
McCabe [30]	No	Yes	Yes	Narrative	CROB and the CASP (Critical Appraisal Skills Programme) for randomised controlled trials checklist. Three studies rated as high-quality; all other studies had high/medium risk of bias for blinding. One study had medium risk of bias for randomisation.	Cochrane Risk of Bias Tool for Randomized Controlled Trials and the CASP (Critical Appraisal Skills Programme) for randomised controlled trials checklist. Three studies rated as high-quality; all other studies had high/medium risk of bias for blinding. One study had medium risk of bias for randomisation.	Low
Chartier [28]	Yes	Partial	Yes	Narrative	ROB-2: 5 studies evaluated as low bias, 2 as moderate to high bias (outcomes, missing data, selective reporting.	Heterogeneity referred to in the discussion section over outcomes and findings.	Critically low
Wand [44]	No	Partial	Yes	Narrative	Quantitative research: Alberta Heritage Foundation for Medical Research Standard Quality of Assessment Criteria. Quality studies varied widely; only six studies rated as high-quality. Underpowered, potential for Type 1 error. Lack of blinding for outcome ratings. Loss to follow-up not discussed.	Heterogeneity discussed in terms of study design, interventions, and outcomes.	Critically low
Davidson [46]	No	Partial	Yes	Narrative	Not reported.	Not reported.	Critically low
Ferguson [43]	No	Partial	Yes	Narrative	Joanna Briggs Institute critical appraisal tool. Variable risk of bias, with some insufficient reporting in primary studies for treatment concealment and blinding (2 studies).	Heterogeneity discussed for designs, interventions, participants, and outcomes, and in discussion	Critically low
Luxton [47]	No	Partial	No	Narrative	Not reported.	Not reported.	Critically low
Mann [48]	No	Partial	No	Narrative	Not reported.	Heterogeneity discussed for psychiatric illness, demographics, sample sizes, outcome measures, and interventions	Critically low
Donker [42]	No	Partial	Yes	Narrative	Jadad's quality criteria. Most studies measured as adequate. Bias included retention and incomplete outcome data.	Not reported.	Critically low

Adapted Grade scoring [17]: High = 0 downgrades, Moderate = 1 or 2 downgrades; Low = 3 or 4 downgrades; Very low = 5 or 6 downgrades (only applies to quantitative studies)

Abbreviations: *CBT* cognitive behavioural therapy, *CAT* Cognitive analytic therapy, *MBT* Mentalisation-based therapy, *DBT* dialectical behaviour therapy, *TAU* treatment as usual, *CPDpd* Cognitive behavioural therapy adapted for people who have received a personality disorder diagnosis, *CROB* Cochrane risk of bias tool

Table 4 AMSTAR 2 [21] ratings across 23 reviews

Citation	1. PICO	2. Protocol*	3. Study design	4. Search strategy*	5. Duplicte selection	6. Duplicate extraction	7. Exclude studies*	8. Included studies	9. Risk of bias (ROB)*	10. Funding sources	11. Analysis*	12. impact of rob	13. ROB in discussion*	14. Heterogeneity	15. Publication bias*	Conflict of interest	Synthesis type	Amstar Ranking
Witt [21]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Meta-analysis	High
Hawton [34]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Meta-analysis	High
Nuij [29]	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Meta-analysis	Low
Arshad [32]	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	NA	NA	Yes	Yes	NA	Yes	Narrative for suicide attempts	Low
Zarska [41]	Yes	Yes	Yes	Partial	Yes	Yes	No	Yes	Yes	No	NA	NA	Yes	No	NA	Yes	Narrative	Low
McCabe [30]	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	NA	NA	Yes	Yes	NA	Yes	Narrative	Low
Hofstra [31]	Yes	Yes	Yes	Partial	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Meta-analysis	Critically low
Lengvenyte [36]	Yes	Yes	Yes	Partial	Yes	Yes	No	Partial	Yes	No	NA	NA	Yes	Yes	NA	Yes	Narrative	Critically low
Doupnik [33]	Yes	Yes	Yes	Partial	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Meta-analysis	Critically low
Chartier [28]	Yes	Yes	Yes	Partial	Yes	Yes	No	Partial	Yes	No	NA	NA	Yes	No	NA	Yes	Narrative	Critically low
Fox [25]	Yes	No	Yes	Partial	Yes	Yes	No	No	Yes	No	Yes	yes	Yes	Yes	Yes	No	Meta-analysis	Critically low
Meerwijk [37]	Yes	No	Yes	Partial	Yes	Yes	No	Partial	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Meta-analysis	Critically low
Hou [35]	Yes	No	Yes	Partial	Yes	Yes	No	Partial	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Meta-analysis	Critically low
Wand [44]	Yes	No	Yes	Partial	Yes	Yes	No	Yes	Yes	No	NA	NA	Yes	Yes	NA	Yes	Narrative	Critically low
Azizi [40]	Yes	No	Yes	Partial	Yes	Yes	No	Partial	Yes	No	NA	NA	No	Yes	NA	Yes	Meta-analysis	Critically low
DeCou [45]	Yes	No	Yes	Partial	No	No	No	Yes	No	No	Yes	No	No	Partial	No	Yes	Meta-analysis	Critically low
Sobanski [39]	Yes	No	Yes	Partial	Yes	No	No	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Meta-analysis	Critically low
Noh [38]	Yes	No	Yes	Partial	No	No	No	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes	Meta-analysis	Critically low
Davidson [46]	Yes	No	Yes	Partial	Yes	Yes	No	No	No	No	NA	NA	No	No	NA	No	Narrative	Critically low
Donker [42]	Yes	No	Yes	Partial	Yes	Yes	No	Yes	No	No	NA	NA	No	Partial	NA	Yes	Narrative	Critically low
Ferguson [43]	Yes	No	Yes	Partial	Yes	Yes	No	Yes	Yes	No	NA	NA	Yes	Yes	NA	Yes	Narrative	Critically low
Luxton [47]	Yes	No	No	Partial	No	No	No	No	No	No	NA	NA	No	No	NA	No	Narrative	Critically low
Mann [48]	Yes	No	Yes	Partial	No	No	No	Yes	No	No	NA	NA	No	No	NA	Yes	Narrative	Critically low

*Critical flaws AMSTAR ratings: [22] Judgments are made on an evaluation of critical and non-critical weaknesses. High: zero or one non-critical weakness; Moderate: more than one non-critical weakness; Low: One critical flaw without non-critical weaknesses; Critically low: more than one critical flaw, with or without non-critical weaknesses. Partial counted as 'No' for classifications. Yes = authors completed task; No = not reported; Partial = partially completed tasks

Table 5 Table of characteristic for systematic reviews ($N = 23$)

Citation	Date	Studies (*N*)	*N*	Country	Age	Gender %F	Population	Settings	Interventions as defined by authors	Controls	Follow-up	Designs	Synthesis	Outcomes
Azizi [40]	2006–2021	19	13,715	Europe, Middle East, Asia, Oceania, S America, S pacific	*M* = 32; Range: 26–45	60%	People with first time, suicide attempts.	Cross-setting interventions (e.g., emergency department, outpatient clinics, case management services).	Brief contact interventions defined as low-cost, non-intrusive interventions that aim to maintain long-term contact with patients after a suicide attempt without the provision of additional therapies. They included regular brief caring or follow-up after presentations to hospital for suicide attempts, via phone calls, messages, letters, texts, or postcards, to mitigate future suicide risk.	TAU	30% < 12 months; 70% >12 months.	RCT	Meta-analysis. Split interventions into those where follow-up lasted less versus more than 12 months.	Suicide re-attempts.
Nuij [29]	2013–2018	6	3536	N America, E Asia, Europe	Range: 26–48 years	38%	People at risk of suicide.	Four emergency departments, two case management services.	Safety planning interventions defined as a stand-alone intervention that contained personalised coping strategies and sources of support.	TAU or case management, or screening.	3 months-12 months.	RCT, CT, ITS	Meta-analysis.	Combined rate of suicide attempts and suicide deaths (composite).
Doupnik [33]	2002–2020	14	4270	N America, Europe, SE Asia	Range: 10–64	.	Patients with suicide risk.	Hospitals, emergency departments, urgent care centres, military mental health clinics.	Brief contact interventions: single session in-person encounters with or without follow-up phone calls, texts, or letters. Interventions aimed to prevent patients from engaging in subsequent suicidal behaviour or to enhance treatment engagement. The most common intervention was safety plans, defined as identifying personalised warning signs, developing coping strategies, identifying caring and professional supports and means restriction.	TAU	Two to 12 months.	RCT	Meta-analysis. Combined interventions.	Suicide re-attempts.

Table 5 (continued)

Citation	Date	Studies (*N*)	*N*	Country	Age	Gender %F	Population	Settings	Interventions as defined by authors	Controls	Follow-up	Designs	Synthesis	Outcomes
Hou [35]	1976–2021	16	5338	.	*M* = 32.2, *SD* = 12.8	.	Patients discharged from hospital settings, patients with recent suicide attempt or self-harm, or at risk of suicide.	Mixed settings (e.g., outpatient, military clinics, hospitals, emergency departments, crisis centre, primary care).	Social support interventions: having at least one component that promoted social support/connectedness, or decreased social isolation/feelings of loneliness (postal, text, face-to-face, email).	TAU, waitlist.	Three months to 5 years.	RCT	Meta-analysis	Suicide attempts, suicide.
Noh [38]	1993–2013	5	498	Europe, E Asia	*M* = 34.2, *SD* = 4.7	55-77%	People with prior suicide attempts or self-harm.	Mostly emergency department, or psychiatric inpatient assessment unit at a general hospital.	Effectiveness of telephone-delivered interventions following suicide attempts.	TAU	1 month to 13 months.	RCT/CT	Meta-analysis	Self-harm, suicide re-attempts, suicide.
Witt [21]	1977–2020	76	21,414	Europe, Oceania, N. America, Middle East, Asia	*M* = 31.88, *SD* = 11.7	61%	Patients with a recent presentation for self-harm, aged 18 or over.	Inpatient or outpatient settings (85.5% = outpatient setting or in home; 5 trials in emergency departments).	Psychosocial interventions for self-harm defined as individual or group-based psychological therapy, that may vary in delivery, location of treatment, frequency, and intensity (e.g., CBT, problem solving therapy, DBT, MBT, Emotion regulation psychotherapy, psychodynamic psychotherapy, case management, structured general practitioner, brief emergency department-based interventions, remote contact interventions, provision of follow-up and support, multimodal interventions, mixed interventions). Categorisation of interventions based on trials and expert consensus.	TAU, or other comparators (None, EUC).	0, 6, 12 months post treatment.	RCT	Meta-analysis. Interventions and outcomes separately.	Repeated self-harm, attempted suicide, suicide.

Table 5 (continued)

Citation	Date	Studies (*N*)	*N*	Country	Age	Gender %F	Population	Settings	Interventions as defined by authors	Controls	Follow-up	Designs	Synthesis	Outcomes
Hawton [34]	1978–2014	26	8480	Europe, N America, Middle East, Asia, Oceania	*M* = 25.5, *SD* = 15.7	71%	Patients with a recent presentation for self-harm aged 18 or over.	Inpatient or outpatient settings.	Effectiveness of suicide prevention interventions (CBT, brief contact interventions, outreach, problem solving, adherence, continuity programme, safety plans, postcards, telephone follow-up, brief CBT, attempted suicide short intervention programme, DBT). Categorisation of interventions based on trials and expert consensus.	TAU, lower intensity active control.	Six,12, to 24 months follow-up.	RCT	Meta-analysis. Interventions analysed and outcomes separately.	Repeated self-harm, attempted suicide, suicide.
Sobanski [39]	1990–2020	18	1990	'high income'	*M* = 20.4, *SD* = 0.76 to 44.8, *SD* = 16.4	16–90%	Adults aged 18 or over, with history of suicide attempts.	Inpatient and outpatient, community, emergency department.	Psychotherapeutic interventions, defined as based on psychological theories and science, with the aim of modifying behaviour, cognitions, or emotions to reduce suicide re-attempts (e.g., CBT, DBT, psychodynamic psychotherapy problem solving).	TAU	3 to 24 months.	RCT	Meta-analysis. Interventions analysed together and separately.	Suicide attempts/ suicide. Composite. Excluded: Self-harm.
Fox [25]	1970–2020	591	1186	Europe, N America, Middle East, Asia, Oceania	*M* = 33, SD = 13.4	62%	Population as percentage of effect sizes (*n* = 3,458 effect sizes): patients with psychopathology = 60.3%; history of self-injurious behaviour = 28.2%; general samples = 11.5%.	Cross-setting interventions including emergency departments, inpatient and outpatients.	Interventions for suicide and self-injury. Percentage of effect sizes: CT, CBT = 11.7%; DBT = 7%, combinations of therapy and meds = 6.3%; checking-in programs = 2.5%; problem-solving therapy = 1.6%; safety planning and/or means restriction = 1.47%; psychoanalysis = 0.93%; and inpatient hospitalisation = 0.12%.	Active control, placebo, non, TAU.	Pre-post treatment, first, last, all follow-ups.	RCT	Meta-analyses. Interventions pooled and analysed separately in moderator analyses.	Suicide, suicide attempts, NSSI, self-harm (composite and separate in meta-analyses).

Table 5 (continued)

Citation	Date	Studies (*N*)	*N*	Country	Age	Gender %F	Population	Settings	Interventions as defined by authors	Controls	Follow-up	Designs	Synthesis	Outcomes
DeCou [45]	1999–2016	18	987	.	*M* = 31, *SD* = 7.3	.	Inpatients and outpatients diagnosed with borderline personality disorder, bipolar disorder, or people hospitalised for a suicide related event.	Cross-setting interventions, mostly in outpatient settings.	Dialectical behaviour therapy, defined as treated emotional dysregulation, via providing dialectical strategies, core strategies (validation and problem solving), CBT strategies, communication strategies, case management and structural strategies.	TAU, waitlist, active control.	Two weeks to 12 months.	RCT	Meta-analysis.	Suicidal behaviours, self-harm (composite).
Hofstra [31]	2011–2017	15	252,923	N America, Europe, Middle East, S Asia	Range 12 + to 18+	.	Adults aged 18 or over, with history of suicide attempts.	Cross-settings: (outpatient, emergency departments, psychiatric wards in general hospitals).	Effectiveness of suicide prevention interventions (brief contact interventions, outreach, problem solving, adherence, continuity programme, safety plans, postcards, telephone follow-up, brief CBT, attempted suicide short intervention programme, DBT).	TAU, alternative intervention.	6 to 60 months.	CT, CCT QEP, ITS	Meta-analysis. Combined interventions.	Rates of suicide, suicide re-attempts combined and separate. Excluded: Self-harm.
Meerwijk [37]	1987–2015	44	13,369	N America, Europe, SE Asia, Middle east, S Asia	'Adults and adolescents'	.	People at risk of suicidal behaviour.	Cross-setting interventions that included case management, emergency departments, outpatient clinics.	Psychosocial and behavioural interventions that specifically target suicide or mental illness symptoms (e.g., depression, hopelessness, anxiety, depression) associated with suicide. Direct interventions were mostly based on cognitive or dialectical behaviour therapy. Indirect, were based on skill development, active outreach, psychotherapy, or case management.	TAU, or alternative intervention.	Mean: 13.6 months.	RCT	Meta-analysis Combined interventions based on aim to directly or indirectly target suicidal thoughts and behaviour.	Suicide/suicide attempt, composite post-treatment and at longer-term follow-up. Excluded: Self-harm.

Table 5 (continued)

Narrative reviews														
Citation	**Studies (date)**	**Studies (N)**	**N**	**Country**	**Age**	**Gender %F**	**Population**	**Settings**	**Interventions as defined by authors**	**Controls**	**Follow-up**	**Designs**	**Synthesis**	**Outcomes**
Chartier [28]	2004–2019	13	2981	Europe, N America	Adults: *M* = 34.5, *SD* = 9.1 Adolescents: *M* = 15.3,*SD* = 0.4	12-22%	Patients receiving suicide prevention interventions in the emergency department	Emergency departments.	Single session psychosocial interventions in the emergency department for suicide-related thoughts or behaviours: crisis interventions, and crisis response plans, safety plans. Interventions included developing and reinforcing coping skills, collaboration, recognition of warning signs, identifying access to support, and means restriction (safety plans).	None, TAU, contract for safety.	.	Mixed: RCT, QED, Observational	Narrative	Suicide re-attempts.
Zarska [41]	1998–2018	15	4272	N.America, Europe, Oceana, Japan	*M* = 39.8, *SD* = 6.3	12-56%	People receiving interventions for self-harm or suicide attempts.	Emergency departments.	Training interventions for emergency department providers and psychosocial interventions delivered by emergency department providers for patients who have self-harmed. Interventions included problem solving, safety planning, emergency department assessment and follow-up.	TAU, PP	2 weeks to 1 year.	RCT, QED, Obs.	Narrative	Suicide, attempted suicide, self-harm. Reported data only included suicide-attempts.
McCabe [30]	2005–2019	4	3363	N America Europe Multisite (S Asia, N America)	Adults: *M* = 29.3, *SD* = 7; Adolescents: Range: 14–19	55–57	People at risk of suicide.	Emergency departments.	Brief interventions defined as up to three sessions delivered after a suicide attempt, with or without subsequent brief follow-up.	TAU, ETAU,	18 months to 24 months.	Mixed: RCT, QED, Observational.	Narrative	Suicide, attempted suicide.
Ferguson [43]	2015–2020	26	3262	N America, Europe, India, multi-country	*M* = 37.8, *SD* = 9.1	11-80%	General adults, military veterans, people with history or current experiences of suicidal thinking or behaviour.	Cross-setting (e.g., people hospitalised for suicide risk, emergency departments, outpatient, community).	Safety planning interventions that specifically used the term or referenced Stanley and Brown. Safety plans included recognition of warning signs, identification of coping strategies, social and professional supports, and reducing access to means.	TAU	Variable (9 weeks, 2 years, pre-post).	RCT, QED, cross-sectional, qualitative.	Narrative	Suicide, attempted suicide.
Arshad [32]	2010–2019	22	2016	N America, E Asia	Adults/Adolescents	50–85%	Mixed populations with history of suicidal thoughts or behaviour. or self-harm.	Cross-setting interventions (e.g., hospitals, outpatients, community).	Mobile and internet-based psychological interventions focus on preventing suicidal thoughts and behaviours. Mixed interventions delivered by internet or mobile (CBT, DBT, emotion regulation, coping skills and strategies, signposting, crisis support, gratitude diaries).	None, TAU or active controls.	1 week to 12 months	RCT, single-arm studies, cross-over designs.	Meta-analysis for suicidal ideation. Narrative for suicide attempts.	Suicidal thoughts and behaviours (Non suicidal self-injury, suicide attempts).
Wand [44]	2010–2020	20	101,394	Europe, Asia	*M* = 75.5, *SD* = 6.9	57%	Only 2/20 studies had relevant outcomes. These studies included older age adults receiving specialist aftercare in Hong Kong.	Cross-setting interventions (e.g., inpatient and outpatient hospital to community psychiatric care; post discharge from inpatient hospitals).	Evidence-based aftercare for older adults following self-harm. Social support interventions to prevent suicide (postal, text, face-to-face, email).	TAU without follow-up usual care.	24 months	Historical observational cohort.	Narrative	Suicide, suicide re-attempts.

Table 5 (continued)

Narrative reviews														
Citation	**Studies (date)**	**Studies (N)**	**N**	**Country**	**Age**	**Gender %F**	**Population**	**Settings**	**Interventions as defined by authors**	**Controls**	**Follow-up**	**Designs**	**Synthesis**	**Outcomes**
Luxton [47]	1975–2010	11	8598	N America, Oceania, Europe	.	.	People with history of suicide attempts, self-harm, or were discharged from hospital, or treated an inpatient.	Mixed settings. Mostly patients discharged from emergency care.	Post-discharge suicide prevention interventions that involve follow-up. Follow-up interventions included at least one form of pre-planned follow-up contact (letters, postcards, electronic), phone calls, in-person visits, that was initiated by the care providers and were not part of a larger psychotherapy trial.	.	1 month to 5 years	PP, Obs.	Narrative	Suicide, suicide attempts, self-harm (narrative).
Lengvenyt [36]	2001–2019	914	914	N.America, Europe, E Asia	Range: 25 to 45.	55%	Individuals with recent suicidal ideation and/or suicide attempts.	Cross-settings (inpatient, outpatients, emergency departments, suicide specific services).	Interventions included if directed at suicidal behaviours and delivered in healthcare settings (e.g., CBT, psychodynamic, suicide-specific therapeutic frameworks).	Enhanced usual care.	4 weeks	RCT, CT	Narrative	Suicide attempts. Excluded: Self-harm.
Davidson [46]	2000–2012	6	631	.	.	.	People diagnosed with borderline personality disorder.	Outpatient clinics	Impact of treatment intensity on suicidal behaviour and depression in borderline personality disorder (CAT, CBTpd, DBT, interpersonal psychotherapy, MBT, schema-focused therapy, systems training or emotional predictability and problem solving, transference focused therapy). Less Intensive therapies (100 h or less over 12 months maximum). More Intensive therapies (over 100 h in 12 or more months).	TAU, or alternative therapy.	6 to 12 months	RCT/CT	Narrative	Suicide, attempted suicide, self-harm.
Donker [42]	2002–2010	10	3574	Europe	Range: 15–25, 16+, and 18+	.	People diagnosed with schizophrenia spectrum/psychotic disorders.	Cross-setting interventions: (inpatient, outpatients)	Psychosocial interventions defined as any intervention that provides psychoeducation or psychotherapy and delivered through any format. Interventions included integrated motivational interviewing plus CBT, psychoeducation, psychotherapy, case management, counselling, or community treatment).	TAU	10 weeks to 18 months	RCT/CT	Narrative	Suicide, attempted suicide, self-harm.
Mann [48]	2005–2019	4	3363	N America, Europe, SE Asia, E Asia	Range: Adolecents12-18, Adults: 18–75	55-57%	People at risk of suicide.	Cross setting interventions (inpatient, outpatient, emergency departments, community).	Suicide prevention strategies included psychotherapy interventions (e.g., Cognitive therapy, Skills based treatment, CBT for PD, DBT, CBT, MBT, CBT, DBT, CAMS, Acceptance and commitment therapy, mood-regulation focused cognitive therapy, Post admission cognitive therapy). Contact or active outreach (e.g., telephone contacts, postcards, brief contact interventions, rapid outreach, assertive outreach, crisis response plans), internet-based interventions.	TAU	8 months to 24 months	RCT Obs, QED.	Narrative	Suicide, self-harm, suicide re-attempts.

Abbreviations: *CT* controlled trials, *PP* Pre-post, *CCT* controlled cohort studies, *CBT* cognitive behaviour therapy, *CAT* Cognitive analytic therapy, *EUC* Enhanced usual care, *MBT* Mentalisation based therapy, *DBT* dialectical behaviour therapy, *RCT* Randomised controlled trials, *ITS* Interrupted times series designs, *Obs*. observational study design, *QED* Quasi-experimental designs, *TAU* treatment as usual, *CPDpd* Cognitive behaviour therapy adapted for people who have received a personality disorder diagnosis

RR = 0.62, 95%CI [0.48–0.77]; $k = 19$, $I^2 = 34.2\%$). Participants receiving the brief contact intervention for longer than 12 months had fewer repeated suicide attempts (RD = 13%, 95%CI [3–23%], $k = 4$, $I^2 = 80.3\%$; RR = 0.46, 95%CI [0.10–0.82], $I^2 = 60.8\%$), compared to those who received interventions for 12 months or less (RD = 23%, 95% CI [1–4%], $k = 14$, $I^2 = 32.6\%$; RR = 0.67 (95% CI 0.54–0.80, $I^2 = 0.0\%$) [40].

Doupnik et al. [33] pooled results from seven randomised controlled trials evaluating the effects of brief contact intervention for preventing subsequent suicide attempts compared to control groups. Most of the included interventions were single session and delivered during hospital visits. Some interventions included variable follow-up contacts through phone calls, caring contacts, or care coordination support, ranging from one day to 12 months. Analyses indicated that the pooled interventions resulted in fewer subsequent suicide attempts compared to control groups (pooled OR = 0.69, 95%CI [0.55–0.87], Hedges $g = 0.21$, 95%CI [0.08, 0.33], $k = 7$, $I^2 = 0\%$).

Witt et al. [21] found some evidence to suggest a beneficial effect from a multimodal intervention (three therapy sessions, followed by regular letters for 24 months) in reducing the frequency of suicide attempts by post intervention, for adults admitted to the emergency department following an episode of self-harm, based on one trial with a 24-month follow-up ($M = 0.08$, $SD = 0.28$, $n = 60$ versus $M = 0.82$, $SD = 1.89$, $n = 50$; MD −0.74, 95% CI [−1.27 to −0.21], $N = 110$; $k = 1$; I^2 = not applicable).

Safety plans (brief interventions/meta-analyses)

Nuij et al. [29] analysed data from six studies evaluating standalone safety planning interventions that contained personalised coping strategies and sources of support. Results indicated that the risk of suicidal behaviour (composite outcome of suicide and attempted suicide) was reduced by 43% for the intervention group compared to controls (Safety planning intervention = RR = 0.57 vs. treatment as usual (95% CI [0.41–0.80], $p = 0.001$, $I^2 = 32.5\%$, 95%CI [0–71%], $k = 6$, NNT = 16).

Social support interventions

Hou et al. [35] pooled results from 16 studies evaluating mixed interventions (e.g., brief contact interventions, postal, text, fact-to-face, email), with at least one component that promoted social support/connectedness, or decreased social isolation/feelings of loneliness. Results suggested that social support interventions reduced deaths by suicide (RR = 0.48, 95% CI [0.27, 0.85], $p = 0.01$, $k = 10$, $I^2 = 17\%$) compared to controls. Subgroup analyses indicated that social support interventions were more effective in reducing suicide, when delivered face-to-face (RR = 0.16, 95%CI [0.05, 0.53], for people who had attempted suicide (RR = 0.24, 95% CI: [0.10, 0.58]) but not for other delivery methods or populations.

Provision of information and support

Witt et al. [21] found a significant treatment effect towards fewer deaths by suicide in the multi-country SUPRE-MISS study intervention group in one of the five countries by the 18-month follow-up (OR 0.12, 95% CI [0.03,0.44], $k = 2$, $I^2 = 0\%$), but there were some issues with inconsistent reporting of suicide deaths overall [21, 34, 49].

Structured psychological interventions

Structured psychological therapies may be delivered over multiple sessions, often in outpatient, or follow-up clinics. Psychotherapeutic interventions included treatments based on psychological science and typically included cognitive behaviour therapy (CBT), dialectal behaviour therapy (DBT), and/or problem-solving techniques. Seven quantitative reviews formally evaluated psychotherapies to prevent self-harm or suicide part through meta-analyses [21, 25, 31, 34, 36, 39, 45].

Cognitive behaviour therapy (CBT)

In an updated Cochrane review of psychosocial interventions for self-harm [34, 49], Witt et al. [21] found that CBT reduced self-harm repetition compared to treatment as usual by post-intervention (OR = 0.35, 95% CI [0.12, 1.02]; $k = 4$; $I^2 = 0\%$), 6-month (OR = 0.52, 95% CI [0.38, 0.70], $k = 12$, $I^2 = 2\%$), and 12-month follow-up (OR = 0.81, 95% CI [0.66,0.99], $k = 9$, $I^2 = 0\%$). CBT reduced the frequency of self-harm repetition at six (MD= −0.71, 95% CI [−1.32, −0.11], $k = 4$, $I^2 = 0\%$) and 12-month follow-up ($M = 1.18$, $SD = 4.22$, $n = 40$ versus $M = 4.58$; SD 8.37; $n = 33$; MD −3.40, 95% CI [−6.54, −0.26], $k = 1$, I^2 = not applicable), but not the post-intervention assessment. Using the GRADE criteria [18], Witt et al. [21] rated the quality of evidence as providing 'low certainty evidence'.

Consistent with Witt et al. [21] Sobanksi et al. [39] found that pooled psychotherapeutic interventions (e.g., CBT, DBT, psychodynamic psychotherapy, interpersonal problem-solving skills training) for patients who had attempted suicide, resulted in significantly fewer episodes of suicidal behaviour (composite outcome of suicide and attempted suicide) compared to controls (RR = 0.66; 95% CI [0.48, 0.90], $Z = 2.63$, $p < 0.01$, OR = 0.56, CI [0.36,0.84], $p < 0.01$, $k = 18$, $I^2 = 51\%$). For individual interventions, Sobanksi et al. [39] found significant treatment effects for CBT in the number of suicide re-attempts compared to treatment as usual (RR = 0.66; 95% CI [0.48, 0.90]; $Z = 2.61$, $p < 0.01$; OR = 0.53, CI [0.34, 0.83], $p < 0.01$, $k = 10$, $I^2 = 28\%$), and psychodynamic interventions in reducing the number of suicide re-attempts (RR = 0.21,

95% CI [0.08, 0.57], $Z = 3.08$, $p < 0.001$, OR 0.17, 95% CI [0.06, 0.45], $p < 0.001$, k = 2, $I^2 = 30\%$,). However, treatment effects for CBT compared to TAU were only significant for longer follow-up for (12 months + versus < 6 months) (RR = 0.60, $Z = 2.38$, $p = 0.02$).

Dialectical behaviour therapy (DBT)

DBT may be effective in reducing the frequency of self-harm compared to TAU or another comparator, based on evidence from three quantitative reviews [21, 25, 34]. Consistent with Fox et al. [25] Witt et al. [21] found evidence of beneficial treatment effects for DBT in reducing the frequency of repeated self-harm by post-intervention follow-up (*MD* = −5.00, 95% CI [−8.92, −1.08], $k = 7$, $I^2 = 49\%$, GRADE [18] = very low certainty evidence). Using a composite outcome that included suicide attempts, non-suicidal self-injury, self-harm, and suicide, DeCou et al. [45] found positive treatment effects for combined DBT interventions (e.g., comprehensive and modified DBT) in reducing the frequency of 'self-directed violence' compared to controls (Weighted Mean Effect Size, Cohen's $d = -0.32$, 95% CI [−0.471, −0.176], $k = 15$, $I^2 = 45.48\%$) [45].

Other interventions (Mentalisation-based therapy (MBT), emotion-based regulation psychotherapy, direct interventions)

Based on one trial rated, Witt et al. [21] found evidence to suggest that mentalisation-based therapy may reduce self-harm repetition for adults referred to a specialist personality disorder treatment service (18/71 versus 31/63, OR = 0.35, 95% CI [0.17, 0.73], $N = 134$, $k = 1$, I^2 = not applicable), and the frequency of repetition ($M = 0.38$, $SD = 0.38$, $n = 71$ versus $M = 1.66$, $SD = 2.87$, $n = 63$; *MD* −1.28, 95% CI [−2.01, −0.55]; $N = 134$, $k = 1$, I^2 = not applicable, GRADE [16] = high certainty evidence). Witt et al. [20] found positive treatment effects from group-based emotional regulation psychotherapy for reducing repeat self-harm for women who have received a diagnosis of personality disorder, but not for the frequency of occurrence (OR = 0.34, 95% CI [0.13 to 0.88], $N = 83$, $k = 2$, $I^2 = 0\%$, GRADE [17] = moderate certainty evidence).

Mixed interventions (combined brief contact interventions with DBT, outreach, and other interventions)

Hofstra et al. [31] pooled a range of interventions from 15 studies, including brief contact and follow-up, safety plans, postcards, assertive out-reach, DBT, brief CBT in a meta-analysis. Overall, interventions were associated with fewer episodes of suicidal behaviour (combined outcome of suicide attempts and suicide), compared to controls (Cohen's $d = -0.495$, 95%CI [−0.677, −0.313], $p < 0.001$, $k = 17$, $I^2 = 50\%$), fewer deaths by suicide (Cohen's $d = -0.535$ (95% CI [−0.898, −0.171], $p = 0.004$, $k = 7$, $I^2 = 0\%$), and suicide attempts (Cohen's $d = -0.449$ (95% CI [−0.618, −0.280], $p < 0.01$, $k = 15$, $I^2 = 62\%$). Moderator analyses indicated that interventions delivered to patients admitted to a psychiatric ward in a general hospital had the greatest effect in reducing deaths by suicide compared to controls (Cohen's $d = -1.082$, 95%CI [−2.027, −0.137], $p = 0.025$). Whereas interventions delivered in emergency departments or outpatient mental health services had no statistically significant effect on deaths by suicide compared to controls. For suicide re-attempts, interventions delivered in outpatient settings had the largest effect sizes (Cohen's $d = -0.705$, 95% CI [−1.275, −0.135], $p = 0.015$), followed by psychiatric wards in general hospitals (Cohen's $d = -0.483$, 95% CI [−0.892, −0.073] $p = 0.021$), and emergency departments (Cohen's $d = -0.319$, 95% CI [−0.528, −0.110], $p = 0.003$).

Direct versus indirect interventions

Meerwijk et al. [37] classified interventions into those that directly addressed suicidal behaviour (mostly CBT or DBT), and indirect interventions that addressed symptoms associated with suicide or mental illness such as hopelessness, anxiety, or depression. Results indicated that direct interventions significantly reduced the odds of suicidal behaviour (composite outcome of suicide re-attempts and suicide) compared to controls groups (OR = 0.82, 95% CI [0.70,0.96]; $k = 19$, $I^2 = 0.0\%$, NNT = 17). Of the indirect interventions, only active outreach reduced the odds of suicide or suicide attempts by the end of follow-up (OR = 0.80, 95% CI [0.66,0·97], $k = 7$, $I^2 = 0.0\%$).

Narrative effectiveness summary

Narrative and quantitative review findings were broadly consistent for safety plans, CBT and DBT. Consistent with quantitative findings [29], narrative reviews consistently indicated positive effects from safety planning interventions in reducing suicide attempts compared to controls [28, 30, 43]. Three narrative reviews suggested that post-discharge follow-up or outreach may reduce suicide risk, based on relatively few studies [44, 47, 48]. Luxton et al. [47] suggested that post-discharge follow-up may reduce suicide attempts (3 studies), and suicide (2 studies). Wand et al. [46] suggested an assertive aftercare programme for older adults may be beneficial in reducing suicide but highlighted significant methodological limitations and small absolute risk reductions with the study [46]. Consistent with quantitative reviews [21, 25, 34], Mann et al. [48] concluded that CBT-based interventions and DBT reduced suicide attempts. Similarly, Davidson et al. [46] found that DBT reduced the frequency of self-harm at post intervention follow-up, irrespective of the intensity, but there no difference between intervention and control groups.

Conflicting evidence

Non-significant findings for interventions

Several reviews evaluated interventions but did not find statistically significant treatment effects for reducing self-harm or suicide attempt repepition [21, 25, 32, 34, 38, 39, 42]. These interventions are listed in Table 6. Hawton et al. [34, 49] and Witt et al. [21] evaluated several brief contact interventions separately and found non-significant treatment effects for telephone contact interventions, postcards, emergency cards, coping cards, and letters in reducing self-harm repetition compared to controls. Emergency cards were also associated with an increased risk of self-harm repetition for participants with a history of multiple episodes of self-harm (52/194 vs. 33/200, OR 1.85, 95% CI [1.14, 3.03], $k = 1$) [21, 34, 49]. For the provision of information support, Hawton et al. [34] and Witt et al. [21] found no evidence of an effect for the intervention group compared to controls for reducing suicide attempts. In contrast to Sobanski et al. [39] Witt et al. [21] found no evidence of an effect for psychodynamic psychotherapy on reducing self-harm repetition.

Table 6 Non-significant treatment effects for interventions in included systematic reviews

Citation	Interventions	Outcome (non-significant treatment effects)
Hawton [34, 49] Witt [21]; Fox [25]	Cognitive-behaviour therapy (CBT) vs. TAU.	Frequency of self-harm repetition by post-intervention assessment, or time to repeat self-harm. Deaths by suicide by end of follow-up.
Witt [21]; Fox [25]	Group-based CBT-based interventions vs. TAU.	Self-harm repetition by end of intervention or follow-up.
Hawton [34, 49], Witt [21]; Fox [25]; Sobanksi [39]	Dialectical behaviour therapy (DBT) vs. TAU.	Repeat self-harm, suicide re-attempts, or deaths by suicide by post-intervention or follow-up.
Witt [21]; Fox [25]	DBT-group-based skills training compared to standard DBT.	Suicide reattempts or non-suicidal self-injury by the post-intervention period (repeated or frequency of events)
Witt [21]	Individual-based DBT vs. standard DBT.	Suicide reattempts or non-suicidal self-injury by the post-intervention period (repeated or frequency of events)
Witt [21]	Brief one-off emergency-department based interventions: (Collaborative Assessment and Management of Suicidality, DBT-based intervention, Brief Guided Integrated Motivational-Volitional focused intervention).	Repeat self-harm or frequency of occurrence by post-intervention or end of follow-up.
Witt [21]	Psychodynamic psychotherapy	Repeat self-harm by post-intervention or end of follow-up.
Sobanski [39], Fox [25] Hawton [34, 49], Witt [21]	Interpersonal problem-solving therapy vs. alterative psychotherapy.	Repeated self-harm or suicide by end of follow-up
Hawton [34, 49], Witt [21]	Continuity of care by same therapist.	Repeated self-harm or suicide by end of follow-up
Hawton [34, 49], Witt [21]	Behaviour therapy.	Repeated self-harm by end of follow-up.
Hawton [34, 49], Witt [21]	Case management.	Repeated self-harm or suicide by post-intervention assessment.
Hou [35]	Social support interventions.	Suicide attempts by end of follow-up.
Hawton [34, 49]; Noh [38]; Witt [21]; Ashad [32]; Sobanski [39]	Telephone contact interventions/remote contacts, telephone contact combined with emergency cards and letters, telephone-based psychotherapy.	Suicide attempt or repeat self-harm, by post-intervention or follow-up.
Hawton [34, 49], Witt [21]	Postcards.	Repeated self-harm and suicide by post-intervention assessment or end of follow-up. Frequency of self-harm by end of follow-up.
Hawton [34, 49], Witt [21]	Emergency cards, coping cards, letters.	Repeated self-harm and suicide by post-intervention assessment or end of follow-up. Frequency of self-harm by end of follow-up.
Hawton [34, 49], Witt [21]	Intensive inpatient and out-patient treatment vs. TAU.	Repeated self-harm by post-intervention or end of follow-up. Frequency of self-harm by follow-up.
Hawton [34, 49], Witt [21]	General hospital admission vs. other form of psychotherapy.	Repeated self-harm by post-intervention assessment or end of follow-up
Hawton [34, 49], Witt [21]	Intensive outpatient treatment vs. TAU.	Repeated self-harm or suicide by end of assessment or follow-up.
Hawton [34, 49], Witt [21]	Long-term psychotherapy vs. other alternative psychotherapy.	Repeated self-harm by end of assessment or follow-up.
Hawton [34, 49], Witt [21]	Provision of information and support.	Repeated self-harm (attempted suicide) by end of follow-up.
Sobanksi [39]	Problem solving, post-admission cognitive therapy, and phone-based positive psychology.	Self-harm and suicide combined rates.
Donker [42]	CBT, DBT, motivational interviewing, supportive counselling compared to controls for patients with schizophrenia spectrum disorders and psychosis.	Self-harm, attempted suicide, or suicide by post-intervention or end of follow-up.
Zarska [41]	No training interventions found that link with patient care or patient experience outcomes.	Repeated suicide attempts by post-intervention or end of follow-up.

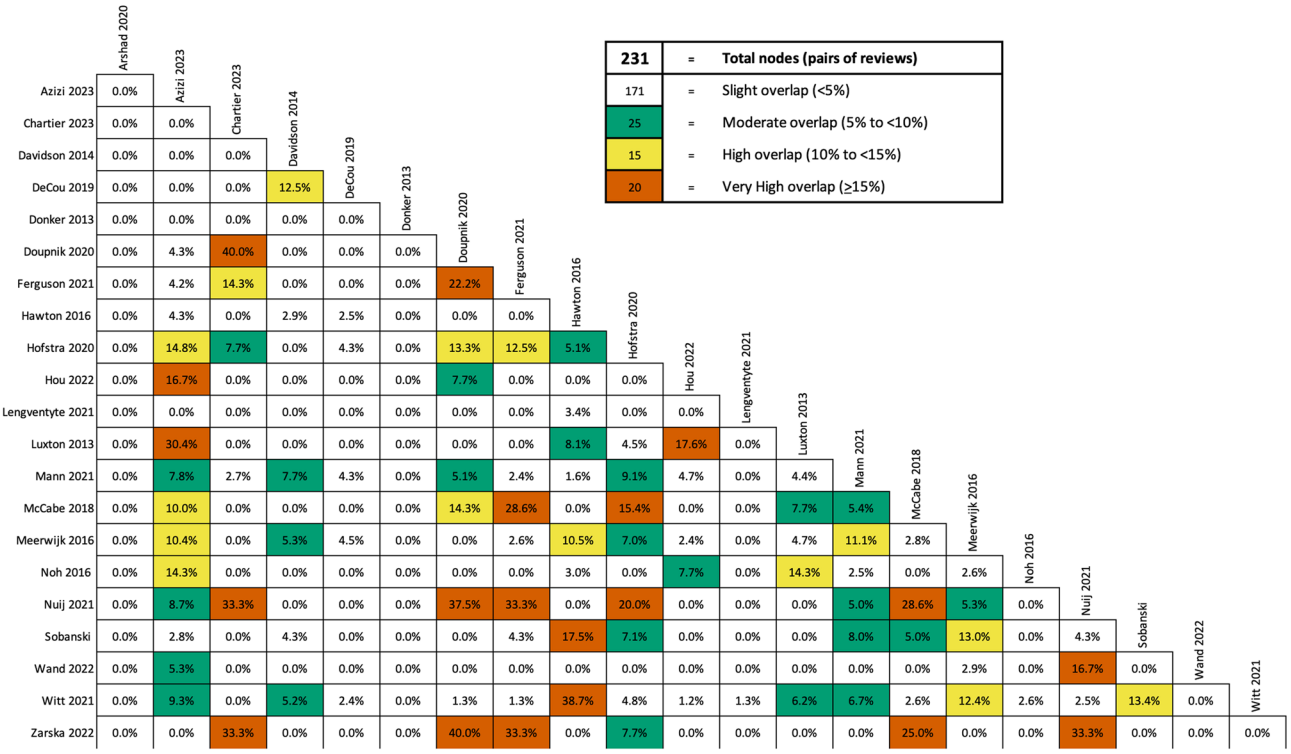

Fig. 2 Graphical representation of overlap for overviews heat map for primary study overlap analysis for citations for self-harm, suicide, and suicidal behaviour (excludes Fox et al. [25])

Review overlap: fraction of evidence synthesised in two or more reviews

The Covered Area for the available reviews was 8.29% and the Corrected Covered Area was 3.92% indicating a slight degree of overlap for the overall review. However, several pairs of reviews for brief interventions and safety planning interventions had very high overlap (See Fig. 2). For example, Zaraka et al. [41] had 'very high overlap' with Doupnik et al. [33] (40%), Nuji et al. [29] (2021) had high overlap with Doupnik et al. [33] (35.7%), Ferguson et al. [43] (33%), Chartier et al. [28] (33%), and McCabe et al. [30] (28.6%), and Hofstra et al. [31] (20%). As expected from an updated Cochrane Review, Witt et al. [21] had very high overlap with Hawton et al. [34] However, Witt et al. [21] includes additional evidence from 21 new trials of psychosocial interventions for people who had self-harmed. Figure 3 presents the Graphical Representation of Overlap Overviews heat map form the primary study overlap analysis.

Discussion

Person-centred brief contact interventions may offer a pragmatic, scalable option for acute care settings, when integrated into care pathways with adequate follow-up. However, limitations of the research, including generalisability to other healthcare contexts and populations warrant consideration and further evaluation, prior to implementation. Overall, we found substantial heterogeneity, variable trial quality, and limited patient involvement. This could be taken as highlighting the need for bigger and better randomised trials. However, a more urgent priority might be to assess how well these promising interventions work when implemented in real world settings and to ensure they are safe, effective, and acceptable within liaison psychiatry services.

Brief contact interventions

Quantitative [29, 31, 33, 40] and narrative reviews [28, 30, 41, 43] demonstrated the effectiveness of person-centred brief contact interventions in reducing suicide reattempts compared to treatment as usual (TAU). Safety planning interventions, which enable patients to identify warning signs, coping skills, and support networks, were commonly included in reviews [28, 29, 33, 40, 41, 43, 47]. Two reviews [29, 43] provided specific evidence for the effectiveness of safety plans as standalone interventions in reducing suicide risk. However, findings for remote-only interventions such as postcards, text messages, and phone calls, were inconsistent, which may partly reflect heterogeneity introduced pooling different types of interventions [21, 32, 34, 38]. These inconsistences might also highlight the essential role of relational care and personalisation following an episode of self-harm. Some remote interventions (e.g., automated texts), might

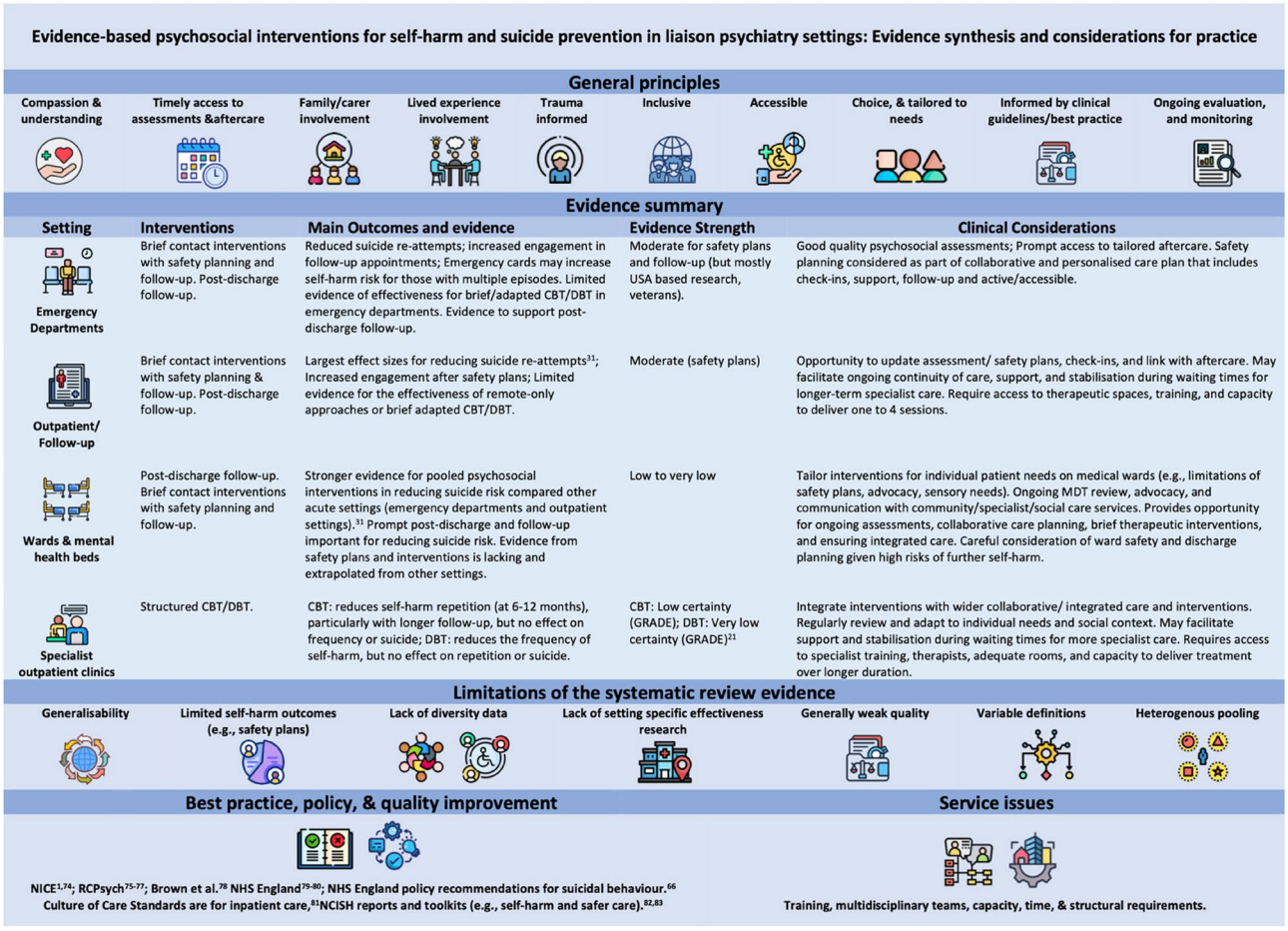

Fig. 3 Infographics summary of the systematic review evidence and clinical considerations

fail to adequate validate and therapeutically engage individuals experiencing psychological distress. Findings also highlight the importance of setting specific needs, due to stronger evidence for suicide risk reduction in general hospital wards, and for reducing suicide re-attempts in outpatient settings [31].

Safety planning: caveats

Despite widespread clinical adoption, the evidence for standalone safety planning interventions remains narrow and methodologically limited. Most studies incorporated safety plans within broader, collaborative interventions that varied in delivery mode, number of sessions, follow-up frequency, and management of referrals. No study evaluated the provision of a safety plan document alone, without clinical input and/or follow-up. The only quantitative review that evaluated safety plans as a standalone intervention, utilised a combined outcome of suicide attempts and deaths [29]. Most of the evidence for safety plans is derived from six studies (four RCTS [50–53], one interrupted time series study [54], one cohort study [55]). The highly specific populations and healthcare contexts, including male military veterans in the USA [53, 55] and specialised suicide prevention services in Taiwan [51, 52], limit generalisability to other healthcare settings, populations, and demographics.

Cognitive behaviour therapy and dialectical behaviour therapy

Five quantitative [21, 34, 37, 39, 45] and two narrative reviews [46, 48] consistently found that cognitive behavioural therapy (CBT) reduces suicide attempts and/or self-harm repetition, particularly with longer follow-up. However, CBT did not reduce the frequency of self-harm or suicide [21, 25, 34], which highlights potential limitations of this intervention for people who frequently self-harm. Dialectical behaviour therapy (DBT) reduced self-harm frequency, but did not lower overall repetition or suicide rates [21, 25, 34, 45]. The lack of evidence for brief, single-session DBT adaptions within emergency departments [21] suggests that intervention length, frequency, and setting may impact effectiveness. Donker et al. [42] also highlighted diagnostic specificity in intervention responsiveness, with psychosocial interventions,

including CBT, showing no significant effect in reducing self-harm or suicide risk among individuals diagnosed with schizophrenia spectrum or psychotic disorders [42].

Deaths by suicide

Three reviews identified interventions with potential to reduce deaths by suicide, including information provision, pooled suicide prevention strategies, and face-to-face social support interventions [21, 31, 35]. However, methodological weaknesses and substantial heterogeneity limit these findings. The SURE-MISS trial demonstrated positive effects for information provision in one of five participating countries [21], highlighting potential challenges in intervention transferability and fidelity. The other reviews were limited by heterogeneity in intervention type, delivery, population, and statistical power [31, 35].

Quality of the evidence

Only two reviews [21, 34] received high AMSTAR-2 [22] quality ratings, likely due to AMSTAR-2's stringent criteria, with several otherwise strong reviews downgraded due to reporting issues [29, 30, 32, 41]. Only two reviews evaluated certainty of evidence for clinical practice, which was generally weak to moderate overall [21, 34]. Overall limitations in trial quality, lack of protocol registration, and heterogeneity across intervention types, populations, and settings further limit confidence in conclusions for clinical practice. These limitations highlight the urgent need for more rigorous, better reported reviews and trials in this area. Implementation of any interventions warrant ongoing patient involvement, iterative local evaluation of self-harm, suicide, and patient experience metrics to ensure patient safety.

Strengths and limitations

This umbrella review synthesised broad, heterogeneous evidence from 23 systematic reviews and identified key evidence gaps. Whilst we did not conduct meta-analyses due to substantial heterogeneity, we provide detailed results and parameters that are relevant for research and clinical practice. We could have excluded overlapping reviews, but part of our aim was to highlight this limitation in the evidence base (e.g., for safety plans). Robust methodological assessments were used, including the AMSTAR-2 [22] and the adapted GRADE algorithm [17], to inform review evaluation. However, umbrella reviews are limited by the methodological quality in included reviews and primary studies, heterogeneity, and potential sources of bias. Primary studies ranged from observational designs to RCTS, with many subject to biases for attrition and reporting.

Several reviews lacked adequate gender-related reporting [33, 35–37, 42, 45–47], and others only reported binary categories (male/female). Reporting for other protected characteristics, including ethnicity, disability, neurodivergence, and socio-economic position, was largely absent, likely indicating limitations in the primary evidence. We highlight these systematic biases and provide an evidence overview to inform research and clinical practice. Reporting for patient and public involvement was absent across reviews. However, we integrated lived experience perspectives throughout this process, to ensure relevance to real world clinical practice, patients, and carers. Our multidisciplinary, diverse research team further strengthened the evaluation.

We focused on self-harm and suicide because they are key patient safety outcomes [56]. Other outcomes, including quality of life, functioning, and mental health symptoms are also important [57], but were beyond the scope this umbrella review. Reductions in self-harm repetition may not always align with patient priorities, and interventions might provide benefits in broader areas, including general functioning, social participation, and engagement with services [57]. While we used a published search strategy, some reviews may have been missed, particularly those that have not been translated to English. We excluded reviews of qualitative research, which is an important area for future research. However, we have completed a lived experience companion paper alongside this review, to enrich our summary of quantitative reviews and to provide an in-depth patient contextual viewpoint.

Comparisons with other research

Recent research has reported larger effect sizes for safety plans in emergency department settings [13] than those seen in this umbrella review. Early findings from an UK-based feasibility trial, suggest safety plans combined with psychological interventions may improve hope and care experiences [58]. This umbrella review supports these findings, but also highlights research gaps that need to be considered before widespread implementation in other healthcare contexts. Ongoing trials in the UK evaluating safety plans for emergency presentations [58, 59] and with autistic individuals [60], may further develop this evidence base.

Systematic reviews published after our search end date found no evidence of an effect for mentalisation therapy on reducing self-harm repetition compared to control groups [61], which is contrast to Witt et al. [21]. However, longer treatment durations resulted in larger reductions for self-harm repetition, though findings were based on weaker pre-post designs [61]. Van Ballogooijen at al. [62] found evidence that both direct and indirect suicide prevention interventions may reduce suicide attempts. In contrast, Meerwijk et al. [37] found that direct interventions reduced the likelihood of suicide or attempted suicide compared to controls.

Overall, our results for DBT and DBT are consistent with other reviews [63, 64]. Our findings align with a recent umbrella review reporting CBT and DBT effectiveness for reducing the incidence of self-harm and suicide re-attempts, though that review focused on adolescents [65]. In contrast, we synthesised evidence from broad interventions that may be effective for the wide spectrum of patients presenting to liaison psychiatry settings. Our findings are aligned with calls for improved intervention trial quality [20]. We also highlight methodological limitations across diverse systematic reviews and research gaps, and also the lack of lived experience involvement which weakens the strength of the evidence base.

Clinical and policy implications

Safety plans are widely considered feasible and acceptable [43] and are recommended by clinical guidelines [1] (to consider for use) and recent national UK policy [66]. However, similar to risk assessment tools [67], safety plans may vary, in format, content, and use, and may be used superficially like tick-box assessments or punitively [68, 69]. Given the limited evidence base and widespread uptake, it is important that safety plans are collaboratively developed with patients and healthcare staff, with continuous evaluation of outcomes and treatment engagement. Safety plans should also be part of an overall collaborative, relational clinical assessment, and care package rather than a standalone intervention (e.g., provision of safety plan document alone). High quality pragmatic trials and quality improvement studies are urgently needed, particularly for people who have self-harmed and are at risk of exclusion from services.

Evidence for CBT and DBT highlight the importance of tailoring interventions to individual needs, clinical settings, and patient priorities. CBT and DBT may be more suited to well-resourced outpatient clinics, given results indicating greater reductions in self-harm repetition for longer follow-up and the lack of evidence for the effectiveness of brief adaptions in emergency departments [21]. The methodologically weak evidence of trials for CBT/DBT in reducing self-harm and suicide risk, may reflect challenges in conducting efficacy trials in this area [13]. Translation to real-world clinical practice may be influenced by patient acceptability, relevance, fidelity, and service delivery factors, such as staffing, time, capacity, demand, and funding cuts [13]. Omission of patient-centred outcomes such as social participation and quality-of-life is also a long-standing issue with clinical trials for self-harm and suicide prevention [57].

Improving access to aftercare

There is considerable unmet clinical need for therapeutic intervention and relational care for patients who have self-harmed or presented to hospital with suicide risk [10–12, 70]. Poor access to psychosocial assessments, compassionate care, increasing demand, and limited capacity to deliver timely aftercare for people who have self-harmed are widely reported [10–12]. One potential approach to improving access is to prioritise aftercare based on risk [71]. Existing risk assessment tools have limited predictive utility [72]. While recent research combining clinician risk stratification with machine learning models improved global predictive accuracy (as measured by Area under the Curve) for suicide re-attempts in outpatient and emergency departments at 90 and 180-day follow-up [71], positive predictive values remained low. Even with high sensitivity or specificity levels, and low risk thresholds [71], this may result in overly restrictive care for those misclassified as high-risk and missed care for others deemed as low risk. Longer follow-up (90 to 180 days) may also be incongruent with fluctuating risk, and the widespread lack of access to aftercare.

Without universal, scalable interventions, risk prediction alone could lead in greater inequitable care in self-harm and suicide prevention. Improved and renewed research efforts evaluating brief interventions, as part of a whole-system care pathways may address this clinical need. For example, the large Zero Suicide multi-site quality improvement trial, demonstrated reductions in suicide attempts and deaths through a pathway-based, multi-component intervention delivered to over 450,000 individuals monthly [73]. Central components included safety planning, outpatient mental health care, and evidence-based psychotherapy, suggesting potential benefits from comprehensive, integrated approaches tailored to local need [73].

Conclusion

Brief contact interventions, particularly those incorporating safety planning, are consistently associated with reductions in suicide re-attempts in liaison psychiatry settings. However, despite widespread clinical uptake, the evidence for standalone safety planning interventions remains methodologically limited with questionable generalisability. Tailored, longer-term structured psychological therapies (CBT/DBT) demonstrated greater effectiveness in reducing suicide re-attempts and self-harm repetition, than brief adaptations for emergency departments. Overall, evidence quality of primary research was limited, with substantial heterogeneity and a lack of reported patient involvement. Substantial unmet clinical need for people presenting to hospital with self-harm or suicide risk, is compounded by poor access to therapeutic interventions, limited capacity, and inequitable care. Future research should prioritise high-quality trials, quality improvement studies, and whole-system intervention evaluations. Interventions may be more effective if they incorporate patient priorities, broader outcomes, and are co-developed with those with lived experience.

Supplementary Information

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Supplementary Material 1. Prior checklist, search terms, list of excluded references.

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Patient and public involvement
Research ideas for the grant application were developed together with our PPIE group (MS4MH-R). Our patient and carer advisory members (MS4MH-R) were involved throughout the research process. Our panel collaboratively developed the initial research questions, reviewed protocol and data extraction plans, results and contributed to interpretations, conclusions, implications, and dissemination plans. People with lived experience in this area contributed to drafts, are co-authors, and are completing a lived experience commentary based on this review. There was PPI input into our dissemination plan, which includes communicating key findings to relevant patient groups, carers, and mental health services. EN, EC, EW have also completed a lived experience viewpoint commentary on the review results, whereby issues related to accessing and receiving psychological therapies following self-harm are addressed in depth.

Authors' contributions
NK, RW are co-leads for the NIHR Greater Manchester PSRC Preventing Self-Harm and Suicide Theme and acquired funding for the work. The research idea was developed from previous research, senior expertise, and lived experience over inequities in access to aftercare. JW led the systematic search strategy, subsequent reference management, and flow chart, under the supervision of RW and NK. JW extracted data, JG and FM cross-checked data. LQ extracted and cleaned data, led the paper/project, analyses, PPIE, and wrote the first draft. Members of our PPIE group (MS4MH-R), RE, FS, FM, JW, RW, NK contributed to discussions over inclusion/exclusion, quality, and content. SS supported with content and methodological expertise. EN, EW, EC are lived experience partners for our quality improvement inpatient Culture of Care Programme. EN is a self-harm and suicide prevention researcher and lived experience collaborator for the inpatient quality improvement Culture of Care Programme. Our partners provided ongoing lived experience insights into research, mental healthcare and interventions for self-harm and suicide prevention, and contributed towards interpretation, conclusions, and implications. All authors contributed to subsequent drafts and approved the submitted version.

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Data availability
The dataset supporting the conclusions of this article are included in the systematic review references.

Declarations

Ethics approval and consent to participate
Not applicable.

Consent for publication
Not applicable.

Competing interests
NK is a member of the Department of Health and Social Care (England) National Suicide Prevention Advisory Group. He has chaired and contributed to various committees for the National Institute for Health and Care Excellence (NICE) developing guidelines for suicide prevention, depression, and the management of self-harm. He is supported by Mersey Care NHS Foundation Trust as well as the University of Manchester. FM was a member of the 2022 self-harm NICE guideline development committee.

Author details
[1]Division of Psychology and Mental Health, University of Manchester, Manchester, UK
[2]Manchester Academic Health Science Centre, University of Manchester, Manchester, UK
[3]National Institute for Health and Care Research (NIHR) Greater Manchester Patient Safety Research Collaboration (GM PSRC), University of Manchester, Manchester, UK
[4]School of Medicine, Keele University, Keele, UK
[5]College of Medical and Health, University of Birmingham, Birmingham, UK
[6]Mersey Care NHS Foundation Trust, Manchester, UK

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