

特集Ⅱ 自殺と精神医学

「自殺企図の再発防止に対する複合的ケース・マネジメントの効果：多施設共同による無作為化比較研究(ACTION-J)」の展開*

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Key Words: suicide prevention measures, suicide attempter, critical care center, randomized controlled trial (RCT), case management

はじめに

わが国では周知のとおり、1998年以降自殺者数が3万人を超える事態が10年以上続き(警察庁統計)、2012年にようやく3万人を切って少しずつ減少に転じている。この減少の背景としては、経済状況の好転のみならず、2006年の自殺対策基本法の成立、ならびに翌年の自殺総合対策大綱¹⁾の発表以降、自殺予防対策が国や自治体の責務と定義され、ここ数年官民あげて自殺対策に取り組んだ成果であった可能性が推測される。

では、啓発普及や窓口拡大などさまざまな対策がきわめて広範に行われたことが、どのように自殺予防効果につながったのであろうか。内閣府では、地域自治体の自殺予防対策を推進するために、2009年から3年間各都道府県に配分した地域自殺対策緊急強化基金が、どのような効果をもたらしたかについて、外部委員会を作り検証を行っている²⁾。しかし、成果目標(アウトカム測定)と対策(介入方法)が明確に構

造化されていない限り、エビデンスのある対策がどのようなものであったのかを検証することが難しいであろうことは、容易に推測できる。一方で、今後も自殺者数の確実な減少を目指すためには、介入の無作為化比較試験など、構造化された研究事業を実施し、介入効果のエビデンスを得て、それを有効な施策に展開していくことが必須であろう。

さて、わが国でエビデンスのある自殺対策の創成を目指して実施された研究事業が、2006年から研究実務が開始された厚生労働科学特別研究事業「自殺対策のための戦略研究」である。この戦略研究とは、従来の厚生労働科学研究補助金事業と異なり、国民的ニーズが高く、確実に解決が求められる研究課題について、成果目標と研究方法を事前に定めて、多施設共同でこれを遂行する大規模研究である。自殺対策の戦略研究には、主に地域自治体を対象とした地域介入(コミュニティ・モデル)としての自殺対策研究である「複合的自殺対策プログラムの自殺企図予防効果に関する地域介入研究(NOCOMIT-J)」と、自殺企図患者を対象にした再企図予防のための医療的介入(ハイリスク・モデル)としての自殺対策研究である「自殺企図の再発防止に対する複

* A randomized controlled multicenter trial of post-suicide attempt case management for the prevention of further attempts in Japan (ACTION-J): its perspectives and future directions.

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合的ケース・マネジメントの効果：多施設共同による無作為化比較研究(ACTION-J)³⁾の2つの研究課題が設定された。

このうち本稿では、筆者らがかかわるACTION-Jの意義と概要、さらに研究終了から現在までの本研究に関連する活動を概観した上で、今後の自殺予防に関する医療対策のあり方を些少議論したい。

自殺対策におけるハイリスク・アプローチ

精神疾患に自殺企図が多いことは周知の事実である。また逆に、世界保健機関(WHO)の報告でも、自殺企図は最も強力な自殺の予測危険因子であり、企図の90%以上に精神疾患の診断がつくことが知られている⁴⁾。すなわち、医療、特に精神医療は、自殺企図者に最も高頻度に対応するという点で、自殺予防に重要な役割を持っている。しかし、わが国においては精神疾患の自殺に関する研究はみられるものの、自殺未遂者全般に対する再企図の防止研究は、今までほとんど行われてこなかった。自殺企図者は、身体損傷に関して通常まず身体科救急を受診し、身体的に問題がないことが確認されるか身体的治療が一段落すると、次に精神医学的評価や治療が開始される。したがって、自殺未遂者の再企図防止には、自殺未遂者とファーストコンタクトする救急医療部門を拠点とした未遂直後からの介入、身体科救急と精神科が連携した介入が重要である。

救急医療施設に搬送された自殺未遂患者を対象に実施された無作為化比較試験としては、退院後の患者にはがきでメッセージを伝えるもの、電話による介入、複数の介入を組み合わせたものなどがある。特にWHOの複合的介入研究SUPRE-MISSでは、自殺企図で入院した患者について、退院直前に心理教育と情報提供を行い、さらに退院の18か月後まで医療系専門職が電話や訪問により患者の心境や支援を訪ね、相談支援機関に適宜紹介したり、受診を勧奨する介入研究を5か国で行った。結果、介入群は非介入群に比べて、再企図率に有意差はなかった⁵⁾。

振り返ってわが国では、救命救急センターを舞台とした自殺企図者への介入は、岩手医大、

横浜市立大によるケース・マネジメント介入などがわずかに行われ、また研究も予備的研究にとどまっていた。また、総合病院精神科が年々減少し、救命救急センターに精神科医が常駐している施設はきわめて少なく、身体科救急と精神科救急の連携は、決して十分とはいえなかった。

ACTION-Jの概要

2006年から2011年まで実施された、「自殺企図の再発防止に対する複合的ケース・マネジメントの効果：多施設共同による無作為化比較試験(ACTION-J)」では、こうした課題を克服するため、横浜市立大学、岩手医科大学の救命救急センターで実施され、予備的研究により有効性が示唆された「自殺未遂者に対する自殺再企図防止のためのケース・マネジメント介入」を基本として、次のようなプロトコルが作成された⁶⁾。

まず対象者は、救命救急センターに配置された自殺未遂者で、①20歳以上、②DSM-IVのI軸に該当精神科疾患を有する、③2回以上の判定で自殺の意思が確認されている、④本研究の内容を理解し、同意取得が可能である、⑤入院中に登録に必要な面接・心理教育を受けることができる、⑥評価面接、ケース・マネジメントのために定期的に来院可能で、実施施設から定期的に連絡をとることができること、を登録基準とした。

方法は、2回の研究参加同意を確認後、通常介入群と試験介入群に無作為割付し(図1)、試験介入群には、入院中から退院後1,4,8,12週とその後6か月ごとに、①定期的な対象者との面接、②対象者の情報収集、精神科受療の促進、③かかりつけ医への受領調整、④受診中断者への受領促進、⑤公的社会資源、民間援助組織の紹介と利用調整、⑥家族への心理教育と情報提供、⑦IT(ホームページ)を用いた情報提供、からなるケース・マネジメント介入を行った。

なお、ケース・マネジメントとは、一般的には「サービスを配分する側の要素を調整し、結びつけることにより、ある個人におけるケアのニーズに合わせた包括的なプログラムを保証するための手法」である。ケース・マネジメントは、①ア

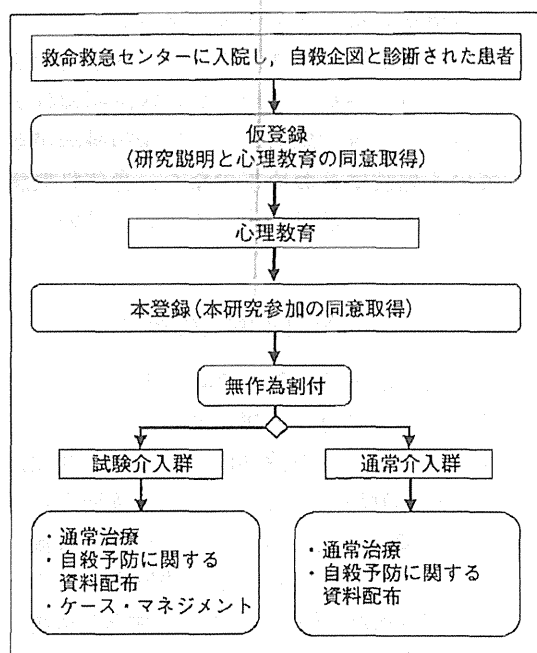


図1 ACTION-J研究の流れ

セスメント, ②プランニング, ③介入(プランの実施), ④モニタリング, ⑤評価・再検討, というプロセスをとる。すなわち, ケース・マネジメントは, それぞれの自殺企図者が抱える経済的問題や対人関係の問題などさまざまな心理社会的問題に対して個別性の高いケアが可能で, さらにその時々に応じて幅広い社会資源とつなげるケアが可能であるという点で, 再企図予防に大きなメリットがあると思われる⁷⁾。

介入効果の評価は, 主要アウトカムを自殺企図(未遂, 既遂を含む)として, ケース・マネジメント介入の効果を明らかにすることとした。

本研究は横浜市立大学精神科を研究班事務局として, 公募により国内の19医療施設(17病院群, 当初)が参加し, 最長5年間介入を実施した。また, 総勢250名以上の医療・福祉従事者, あるいは研究者が研究に参加し, 最終的には, 914名もの自殺未遂者に介入が実施された。2011年6月に介入と追跡は終了し, その後全対象者の膨大な量のベースラインデータ, ならびに追跡期間データのチェックと固定化, そして解析に長時間を要し, 現在, パブリックへの公表準備がなされている⁸⁾。

ACTION-Jの展開

ACTION-J研究の直接の目的は, ケース・マネジメント介入によって再企図率が減少し, この手法の有効性のエビデンスを得て, これを自殺予防の医療政策に反映させることである。これは, より大きな意味でいえば, ①全国的に自殺企図者に十分対応できる医療従事者を増やす, ②自殺予防のためのケース・マネジメントを実践することのできる専門職を養成する, ③身体科と精神科の連携を深める, ということによって自殺予防のハイリスク・モデルとしてのスタンダードを構築することにあつたといえよう。したがって, 自殺企図予防のハイリスク・モデル構築の試みは, ACTION-J以後, その研究の目指すところに沿い, 国, 自治体単位による政策的な活動から, 主にACTION-Jにかかわった研究者, 医療従事者を中心とする実践, 研修活動に至るまでさまざまなレベルで必然的に展開している。

まず, 政策レベルでは, 内閣府が自殺総合対策大綱の改訂において, 「精神科救急医療体制の充実を図るとともに, 救命救急センター等に精神保健医療従事者等を配置するなどして, 治療を受けた自殺未遂者の精神科医療ケアの必要性を評価し, 必要に応じて精神科医による診療や精神保健医療従事者によるケアが受けられる救急医療体制の整備を図る」と謳い, 救急と精神科との連携の必要性を明確化している。厚生労働省は, 2008年に救急医療部門で精神保健指定医が未遂者等の診療を実施した場合の診療報酬加算(救命救急入院料)を新たに設定し, さらに, 同年から救急医療従事者に対する自殺未遂者対応研修を事業化した。

次に学会レベルでは, 先の救急医療従事者に対する自殺未遂者対応研修に, 2009年から日本臨床救急医学会が, 2010年から日本精神科救急医学会が共催団体として運営に参画している。また2009年には, 日本臨床救急医学会, 日本精神科救急医学会の両方で未遂者ケアについてのガイドラインが作成され, 研修会テキストとして用いられている。特に日本臨床救急医学会は, 「自殺企図者のケアに関する検討委員会」を立ち

上げ、自殺企図のみならず救急で対応する精神症状全般に範囲を広げて、「救急医療における精神症状評価と初期診療ガイドブック」を作成している⁹⁾。2013年からは、日本うつ病学会でも「自殺対策研修会：複雑事例を通して学ぶ自殺予防のエッセンシャル」と題して研修を始めている。これらの研修会実施やガイドブック作成には、ACTION-J研究実務に参加した多数の医師、臨床心理士、精神保健福祉士が中心にかかわっている。

最後に、ACTION-J研究に参加していた主だったメンバーは、研究終了後もその成果の施策化と普及を目指し、厚生労働省の支援を得て新たにポストACTION-J研究班を組織し、さまざまな活動を行っている。たとえば、ACTION-Jに参加した医療者によるワーキンググループ活動を行い、一般救急医療にケース・マネジメント介入を行うための実務的課題や人材配置の資格要件についての課題を抽出している。この活動では、Good Practiceの普及やACTION-Jにおけるケース・マネジメント介入の実地臨床への介入のためには、救急医療現場における専門職の専任配置、チーム医療を基本とした実務体制の構築、ケース・マネジメント介入の均霑化などの課題があり、課題克服のためには、①診療報酬の項目化、②ケース・マネジメントを行う専門職に対する特別な資格付与、ならびに、③同資格の更新・制度化が必要であることが示された。また研究班では、ケース・マネジメント介入の窓口となる二次、三次の救急医療現場で活用できるフェイスシート案も開発中である。2013年からは、ケース・マネジメントの提供を施策化するために必須となる、ACTION-Jケース・マネジメント研修プログラムに基づく人材育成のための本格的な研修システムの開発を進め、そのパイロット研修も開始した。

今後の展望

海外においても、自殺企図者の再企図防止が最重要の自殺対策であることが、徐々に認識され始めている。たとえば、Olssonらは、米国の年間自殺者数が3万8千人を超え、この10年で増加している現状において、社会的対策や精神疾

患への幅広い対策では自殺率を減少させる直接効果がみえにくいことから、自殺企図で救急センターを受診する患者の治療後の再企図防止や、精神科病院から退院直後から数か月の患者のケース・マネジメントが自殺対策として重要ではないかと提言し、その領域の研究や医療体制の充実の必要性を強調している¹⁰⁾。すなわち、ここまで紹介してきたACTION-J研究の結果とその後の取り組みは、わが国のみならず世界が求めるエビデンスを持った自殺予防対策としてきわめて重要なのである。

一方で、自殺予防活動を取り巻く現況は厳しい。自殺対策の強化基金も終了し、自殺者数が3万人を切ってから、国や地域自治体の自殺対策に取り組む意欲が徐々に低下している印象が拭えない。本来、もし自殺対策の取り組みが影響して自殺者数が減ってきたなら、むしろ予算を増やすなどしてより対策を強化すべきではなかろうか。筆者らは、昨年ACTION-J研究に参加していた主だったメンバーに、自ら所属する医療機関の現状をアンケート形式で調査した¹¹⁾。その回答をみると、救命救急センターに常駐精神科医がいる所は少なく、人材不足と専門スタッフの継続雇用の不安が深刻で、自殺対策に熱心な精神科医やケース・マネージャーが孤軍奮闘している所がほとんどであった。ACTION-Jの研究開始から数えると早8年が経過し、すでに自殺予防の一線から遠のいた同僚も多い。残された人材がさらに異動すると、早晚自殺未遂者のケア体制が衰えてしまうと不安を訴える声も多かった。

したがって、今後早期にACTION-Jの成果が論文化され、遅滞なくその手法と体制が政策に反映され、経済的支援を得て、未遂者ケアが「当たり前の医療」として体制化され、ひいては一人でも多くの自殺未遂者の命が救われていくことが、切に望まれる。

WHOは、自殺が公衆衛生上の最大課題の一つであるとレポートするなか、次のような言葉も繰り返し述べている。

「自殺予防はみんなの仕事 (suicide prevention is everyone's task)」

文 献

- 1) 内閣府. 自殺総合対策大綱～誰も自殺に追い込まれることのない社会の実現を目指して～. 東京: 内閣府; 2006.
- 2) 内閣府. 内閣府自殺対策検証評価会議: 平成25年度自殺対策検証評価会議報告書～地域自殺対策緊急強化基金・緊急強化事業～. 東京: 内閣府; 2013.
- 3) 河西千秋, 平安良雄, 有賀 徹, ほか. 自殺企図の再発防止方略開発のための多施設共同研究 'ACTION-J' (厚生科学研究費補助金事業 自殺対策のための戦略研究): その背景と研究の概要. 精神神経誌 2008; 110: 230.
- 4) Owens D, Horrocks J, House A. Fatal and non-fatal repetition of self-harm. Systematic review. Br J Psychiatry 2002; 181: 193.
- 5) Bertolote JM, Fleischmann A, De Leo D, et al. Repetition of suicide attempts: data from emergency care settings in five culturally different low- and middle-income countries participating in the WHO SUPRE-MISS Study. Crisis 2010; 31: 194.
- 6) Hirayasu Y, Kawanishi C, Yonemoto N, et al. A randomized controlled multicenter trial of post-suicide attempt case management for the prevention of further attempts in Japan (ACTION-J). BMC Public Health 2009; 9: 364.
- 7) 太刀川弘和, 大塚耕太郎. 自殺企図者に対するケース・マネジメント. 第103回日本精神神経学会総会シンポジウム「自殺問題と予防対策: 厚生労働省戦略研究」. 精神神経学雑誌 2008; 110: 238.
- 8) 河西千秋. ACTION-Jの背景と意義・展望 自殺企図の再発防止に対する複合的ケース・マネジメントの効果: 多施設共同による無作為化比較研究 (ACTION-J). 救急医学 2012; 36: 847.
- 9) 日本臨床救急医学会「自殺企図者のケアに関する検討委員会」. 救急医療における精神症状評価と初期診療—PEECガイドブック. 東京: へるす出版; 2012.
- 10) Olfson M, Marcus SC, Bridge JA. Focusing suicide prevention on periods of high risk. JAMA 2014; 311: 1107.
- 11) 太刀川弘和. 自殺企図者の救急体制に関する精神科医療機関の取組み現況. 精神科 2013; 22: 327.

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Special review article

Interventions to prevent repeat suicidal behavior in patients admitted to an emergency department for a suicide attempt: A meta-analysis



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ABSTRACT

Background: A huge number of patients with self-harm and suicide attempt visit emergency departments (EDs). We systematically reviewed studies and examined the effect of interventions to prevent repeat suicidal behavior in patients admitted to EDs for a suicidal attempt.

Method: We searched the databases of MEDLINE, PsycINFO, CINAHL, and EMBASE through August 2013. Eligible studies were randomized controlled trials assessing the effects on repeat suicidal behavior of interventions initiated in suicidal patients admitted to EDs. Interventions in each trial were classified into groups by consensus. Meta-analyses were performed to determine pooled relative risks (RRs) and 95% confidence intervals (CIs) of repetition of suicide attempt for interventions in each group.

Results: Out of 5390 retrieved articles, 24 trials were included and classified into four groups (11 trials in the Active contact and follow-up, nine in the Psychotherapy, one in the Pharmacotherapy, and three in the Miscellaneous). Active contact and follow-up type interventions were effective in preventing a repeat suicide within 12 months ($n=5319$; pooled $RR=0.83$; 95% CI: 0.71 to 0.97). However, the effect at 24 months was not confirmed ($n=925$; pooled $RR=0.98$; 95% CI: 0.76–1.22). The effects of the other interventions on preventing a repetition of suicidal behavior remain unclear.

Limitation: Caution is needed regarding the heterogeneity of the effects.

Conclusion: Interventions of active contact and follow-up are recommended to reduce the risk of a repeat suicide attempt at 12 months in patients admitted to EDs with a suicide attempt. However, the long-term effect was not confirmed.

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Contents

1. Introduction	67
2. Methods	67
2.1. Search strategy	67
2.2. Study eligibility	67
2.2.1. Inclusion criteria	67

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2.2.2.	Exclusion criteria	68
2.3.	Data management	68
2.4.	Assessment of bias	68
2.5.	Statistical analysis	68
3.	Results	68
3.1.	Study inclusion	68
3.2.	Characteristics of included trials	70
3.2.1.	Active contact and follow-up group	70
3.2.2.	Psychotherapy group	70
3.2.3.	Pharmacotherapy group	70
3.2.4.	Miscellaneous group	71
3.3.	Risk of bias	71
3.4.	Outcome findings	72
3.4.1.	Repeat suicidal behavior	72
3.4.2.	Suicidal death	73
3.4.3.	Outcome: any cause of death	73
4.	Discussion	75
4.1.	Summary of results of the meta-analysis	75
4.2.	Comparison with other systematic reviews	75
4.3.	Strengths and limitations of study	76
4.4.	Implication for research	76
4.5.	Implication for practice	76
5.	Conclusion	76
	Role of funding source	76
	Conflict of interest	76
	Acknowledgment	76
	Appendix A. Supporting information	76
	References	77

1. Introduction

Suicide is a critical global issue. It is the 20th leading cause of death worldwide, with an age-adjusted rate of 16 per 100,000 (World Health Organization). In the United Kingdom, it is estimated that approximately 220,000 patients with self-harm visit hospitals annually (Hawton et al., 2007). The mean number of visits to an emergency department (ED) for attempted suicide and self-inflicted injury per year in the United States was reported as 538,000 in 2005–2008 (Ting et al., 2012).

It is widely recognized that prior suicide attempts and a history of nonsuicidal self-harm are risks for death by suicide and repeat self-harm behavior, including a suicide attempt and nonsuicidal self-harm (Ekeberg et al., 1991; Isometsa and Lonnqvist, 1998; Nielsen et al., 1990; Nordentoft et al., 2011; Nordstrom et al., 1995). Indeed, the risk of a repeat suicide attempt in patients admitted to the ED is as high as 25% (Beautrais, 2004). Previous systematic reviews of psychological autopsy studies revealed that many suicide victims had diagnoses of mental disorders including mood disorders (Arsenault-Lapierre et al., 2004; Bertolote et al., 2004). On the other hand, in our recent article published in the *Journal of Affective Disorders*, we reported that mood disorders were the most frequent psychiatric disorders among suicide attempters in the Emergency Department (Kawashima et al., 2014).

Therefore, the ED is increasingly recognized as an important setting for introducing suicide prevention measures, and studies have focused on developing effective interventions for initiation during an ED stay for patients with attempted suicide (Boudreaux et al., 2013; Hirayasu et al., 2009).

However, recently, inconsistent results were reported between two randomized controlled trials examining the effectiveness of interventions in suicidal patients admitted to the ED (Kapur et al., 2013; Morthorst et al., 2012).

In the present study, we reviewed randomized controlled trials and examined the effects of interventions initiated when suicidal patients were admitted to the ED.

2. Methods

Using an a priori published protocol (Inagaki et al., 2013), we conducted our systematic review and reported according to the criteria of preferred reporting items for systematic review and meta-analyses (PRISMA) (Liberati et al., 2009).

2.1. Search strategy

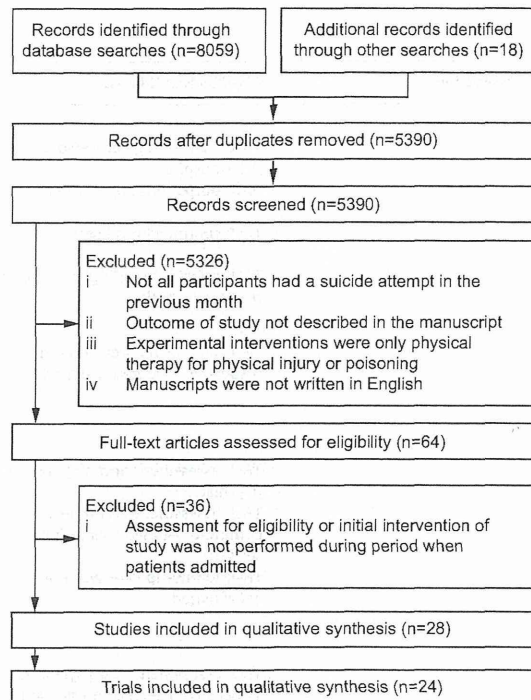
We conducted a search of PubMed (from 1949), PsycINFO (from 1806), CINAHL (from 1981), and EMBASE (from 1974) from their inception up to August 2013. Search terms were (suicid* OR self-harm* OR self harm* OR self-poison* OR overdose* OR self-injur*) AND (randomiz* OR randomis*). Furthermore, we examined the list of references in the identified studies for further references. We did not distinguish between a suicide attempt and deliberate self-harm or self-injury, because there has been inconsistent use of terminology for suicide attempt and self-harm (Hawton et al., 2012).

We reviewed all titles and abstract, and removed the records that met the exclusion criteria or were duplicated. Full-text articles of possibly eligible studies were reviewed and identified according to inclusion and exclusion criteria by at least two authors independently. Disagreements were discussed with a third author and resolved by consensus.

2.2. Study eligibility

2.2.1. Inclusion criteria

Trials were included if they met the following criteria: all participants had attempted suicidal behavior within 1 month and were admitted to an ED for their suicidal behavior; assessment for eligibility or initial intervention in the trial was performed while the patients were admitted to the ED or a subsequent ward; and an effect of an intervention was examined in a randomized controlled trial and was described in the manuscript.



- Nine trials included in meta-analysis of effect of Active contact and follow-up type intervention on repetition of suicide attempt at 12 months
- Two trials included in meta-analysis of effect of psychotherapy on repetition of suicide attempt at 12 months
- Two trials included in meta-analysis of effect of Active contact and follow-up type interventions on repetition of suicide attempt at 24 months
- Five trials included in meta-analysis of effect of Active contact and follow-up type intervention on death by suicide at 12 months
- Three trials included in meta-analysis of effect of Active contact and follow-up type intervention on any cause of death at 12 months

Fig. 1. Identification of studies.

2.2.2. Exclusion criteria

Studies were excluded if they met the following criteria: experimental interventions were only physical therapy for physical injury or poisoning; manuscripts were not written in English; and the main outcome was a subgroup analysis of the trial.

2.3. Data management

We extracted data from the included studies on type of intervention, number of participants, inclusion and exclusion criteria, adherence of participants to interventions, proportion of participants followed up for outcomes, means of establishing suicidal death and/or suicidal behavior if the trial measured these outcomes, and effects of the interventions on repeat suicidal behaviors and death by suicide. We created summary tables of the data. In addition, we summarized the process of development and content of each intervention.

We classified the trials by type of intervention into four groups (Active contact and follow-up, Psychotherapy, Pharmacotherapy, and Miscellaneous). The Active contact and follow-up group consisted of five subgroups (Intensive care plus outreach, Brief intervention and contact, Letter or postcard intervention, Telephone, and Composite of letter/postcard and telephone). The intervention groups were determined by the research members of the study, which included psychiatrists, and psychologists who had experience of working in suicide prevention at EDs.

2.4. Assessment of bias

We also assessed the risk of bias in the included studies according to the Cochrane Handbook for Systematic Reviews of Interventions Version 5.1.0 (Cochrane Collaborative, 2011). We judged the quality of the trials from the aspect of sequence generation (selection bias), allocation sequence concealment (selection bias), blinding of participants and personnel (performance bias), blinding of outcome assessment (detection bias), incomplete outcome data (attrition bias), selective outcome reporting (reporting bias), and other potential sources of bias, by at least two authors independently. Disagreements were discussed with a third author and resolved by consensus.

2.5. Statistical analysis

We examined the effects of each intervention group on repeat suicide attempts, deaths by suicide, and any-cause deaths using a meta-analysis. We did not perform a meta-analysis if there was only one trial in an intervention group assessing an outcome at a specific measurement point. We did not analyze any psychometric measures, such as depression, hopelessness, and suicidal ideations, as outcomes because of differences in the measured outcomes and measurement points.

The meta-analysis determined pooled relative risks (RRs) and their 95% confidence intervals (CIs). A fixed-effects model with the Mantel-Haenszel method was used for synthesizing data from trials that examined similar interventions and study populations. Effect estimates were weighted by the inverse of their variance, giving greater weight to a larger sample size. Also, a random-effects model with the DerSimonian-Laird method (DerSimonian and Laird, 1986) was used to produce an overall summary if there was clinical heterogeneity sufficient to suggest that the underlying treatment effects differed between trials, or if substantial statistical heterogeneity was detected, and if an average treatment effect across trials was considered clinically meaningful. The random-effects summary was treated as the average range of possible treatment effects, and the clinical implications of treatment effects differing between trials are discussed.

For assessment of heterogeneity, we used the I^2 and Cochrane Q statistics to examine heterogeneity among the trials in each analysis. We regarded heterogeneity as substantial if I^2 was greater than 30% or there was a low p -value (< 0.10) in the Cochrane Q test for heterogeneity. We investigated publication bias by inspection of funnel plots and by the Egger test.

In trials with three arms, the trials were included in this review as two separate studies; to avoid double counting, the control group data (events and sample) were shared between the two study comparisons (Cochrane Collaborative, 2011). We carried out statistical analysis using the StatsDirect software version 2.8 (StatsDirect Software Inc., Altrincham, UK).

3. Results

3.1. Study inclusion

From 8077 records identified through database and other searches, 5390 articles were retrieved after duplicates were removed. Out of the 5390 articles, we included 24 trials that reported results in 28 publications (Fig. 1) (Allard et al., 1992; Bannan, 2010; Battaglia et al., 1999; Beautrais et al., 2010; Bertolote et al., 2010; Brown et al., 2005; Carter et al., 2005, 2007, 2013; Cedereke et al., 2002; Crawford et al., 2010; Fleischmann et al., 2008; Ghahramanlou-Holloway et al., 2012; Gibbons et al., 1978; Guthrie et al., 2001; Hassanian-Moghaddam et al., 2011; Kapur et al., 2013; Liberman and Eckman, 1981;

Table 1
Intervention.

	Intervention 1	Intervention 2/Comparison intervention	Control(TAU, Placebo)
Active contact and follow-up group (Intensive care plus outreach)			
Allard et al. (1992)	Intensive follow-up with scheduled visits	-	TAU: care by regular personnel of their hospital TAU: outpatient appointment
Van Heeringen et al. (1995)	Home visit by nurse to patients who did not keep outpatient appointment	-	TAU: routine clinical service
van der Sande et al. (1997)	Intensive in-patient and community intervention	-	TAU: referral to a range of different treatment modalities
Morthorst et al. (2012)	Assertive intervention with outreach consultations	-	TAU: the norms prevailing in the respective emergency department
Active contact and follow-up group (Brief intervention and contact)			
Fleischmann et al. (2008), Bertolote et al. (2010)	Brief intervention and contact	-	TAU: assessment and diagnosis by a psychiatrist TAU: assessment and referral to community-based mental health services TAU: follow-up care was not coordinated.
Active contact and follow-up group (Letter or postcard)			
Carter et al. (2005, 2007, 2013)	Postcard sent	-	TAU: assessment by a psychiatrist and a social counselor and referral to further treatment in general psychiatry
Beautrais et al. (2010)	Postcard sent	-	TAU: no telephone contact
Hassanian-Moghaddam et al. (2011)	Postcard sent	-	TAU: a mental health liaison nursing team to carry out specialist assessments
Active contact and follow-up group (Telephone)			
Cedereke et al. (2002)	Telephone call at 4 and 8 months	-	TAU: routine service: referral back to a GP, psychiatric referral, or other referral
Vaiva et al. (2006)	Telephone call from psychiatrists at 1 month	Telephone call from psychiatrists at 3 months	TAU: standard individual therapy in the outpatients or day hospital TAU: Standard psychosocial assessment
Active contact and follow-up group (Composite of letter/postcard and telephone)			
Kapur et al. (2013)	Information leaflet, two telephone calls within the first 2 weeks, and a series of 6 letters over a 12-month period	-	TAU: All patients in the three groups received necessary psychotropic medication if necessary
Psychotherapy group			
Gibbons et al. (1978)	Problem-solving approach	-	TAU: continuity of care: therapy with the same therapist who assessed the patient in hospital after a suicide attempt
Liberman and Eckman (1981)	Inpatient treatment with behavioral therapy followed by individual and group therapy plus aftercare at a community mental health center or with private therapists	Inpatient treatment with insight-orientated therapy followed by individual and group therapy plus aftercare at a community mental health center or with private therapists	-
McLeavey et al. (1994)	Problem-solving approach	Brief problem-orientated approach	-
Guthrie et al. (2001)	Psychodynamic interpersonal therapy	-	TAU: an assessment, and if necessary, referral to a psychiatry outpatient, addiction services, or advice to consult their own GPs
Raj et al. (2001)	Cognitive behavioral method to enhance compliance	Routine medical treatment plus provision of therapist contact information, and contact by letters twice	-
Brown et al. (2005), Ghahramanlou-Holloway et al. (2012)	Cognitive therapy	-	TAU: care from clinicians in the community and referral services from the study case manager, and contact from case manager
Bannan (2010)	Problem-solving approach	-	TAU: standard individual therapy in the outpatients or day hospital TAU: Standard psychosocial assessment
Ougrin et al. (2011)	Therapeutic assessment: a brief intervention based on cognitive analytic therapy	-	TAU: All patients in the three groups received necessary psychotropic medication if necessary
Wei et al. (2013)	Cognitive therapy	Telephone intervention	-
Pharmacotherapy group			
Battaglia et al. (1999)	Low dose of depot fluphenazine	Ultra-low dose of depot fluphenazine	-
Miscellaneous group			
Torhorst et al. (1987)	Continuity of care: therapy with the same therapist who assessed the patient in hospital after a suicide attempt	Change of care: therapy with a different therapist	-

Table 1 (continued)

	Intervention 1	Intervention 2/Comparison intervention	Control(TAU, Placebo)
Waterhouse and Platt (1990)	Admission to a general hospital, and advice to contact their GP after discharge from hospital, if needed	Discharge home from the casualty department with advice to contact their GP, if needed	
Crawford et al. (2010)	Provision of an appointment card with alcohol nurse specialist and a health information leaflet	Provision of a health information leaflet	-

Abbreviations: TAU, treatment as usual.

McLeavey et al., 1994; Morthorst et al., 2012; Ougrin et al., 2011; Raj et al., 2001; Torhorst et al., 1987; Vaiva et al., 2006; van der Sande et al., 1997; Van Heeringen et al., 1995; Waterhouse and Platt, 1990; Wei et al., 2013).

3.2. Characteristics of included trials

We classified the 24 trials into four categories: 11 trials in the Active contact and follow-up group, nine in the Psychotherapy group, one in the Pharmacotherapy group, and three in the Miscellaneous group (Table 1).

3.2.1. Active contact and follow-up group

We sub-classified the 11 trials into five subgroups: four trials in Intensive care plus outreach, one trial in Brief intervention and contact, three in Letter/postcard, two in Telephone, and one in a Composite of letter/postcard and telephone subgroup.

3.2.1.1. Intensive care plus outreach. Morthorst et al. (2012) examined the effects of contact with suicide attempters at the ED followed by 8–20 outreaches for 6 months by a specialized nurse on repeat suicide attempts. Their intervention was based on one developed and performed by a specialized prevention team for over 20 years in Norway on suicide attempters in the ED without psychosis (Hvid et al., 2011; Johannessen et al., 2011). In another study, Van Heeringen et al. (1995) examined the effect of case-management, with two home visits by a community nurse to increase adherence to care. The intervention was developed using a previous intervention developed by Moller (1989) as a model, which involved continuity of care.

Around the same time, van der Sande et al. (1997) performed a trial to examine effects of an intervention based on a problem-solving approach, which had been developed by Hawton and Catalan (1987) as a model. The intervention was performed by community psychiatric nurses who were assigned to establish a therapeutic relationship with each patient during hospitalization, and focused on helping the patient to overcome the current crisis and on establishing improvements in their ability to cope with future problems.

In an earlier report, Allard et al. (1992) showed no clear effect of an intervention, including at least one home visit by social workers on repeat suicide attempts.

3.2.1.2. Brief intervention and contact. Motto (1976) and Motto and Bostrom (2001) reported a reduction in suicide attempts in psychiatric patients by long-term contact. In another study, De Leo et al. (1995, 2002) reported a reduction in suicidal deaths among elderly people contacted by telephone. Based on these findings, the World Health Organization performed the SUPRE-MISS trial, which was a long-term follow-up with brief contact intervention (Bertolote et al., 2010; Fleischmann et al., 2008).

3.2.1.3. Letter/postcard. Carter et al. (2005, 2007, 2013) investigated the effect of sending a series of eight postcards after

discharge to patients who were admitted to EDs with poisoning self-injury. The intervention was developed using a previous intervention as a model, which showed fewer suicide deaths among a psychiatric hospital inpatient population (Motto, 1976; Motto and Bostrom, 2001). Carter et al. reported that postcard intervention reduced repeat poisoning after 1 year (Carter et al., 2005), 2 years (Carter et al., 2007), and 5 years (Carter et al., 2013). They also reproduced similar results among self-poisoning patients admitted to a poisoning center in a trial performed in Iran (Hassanian-Moghaddam et al., 2011). However, another trial of a similar intervention in self-poisoning patients and suicide attempters with other self-injuries did not show a reduction in repeat suicide attempts after adjusting for baseline characteristics (Beautrais et al., 2010).

3.2.1.4. Telephone. Cedereke et al. (2002) developed a new intervention, which consisted of two telephone calls to suicide attempters discharged from EDs. The intervention was based on a report that long-term contact reduced suicide deaths in psychiatric in-patients (Motto, 1976; Motto and Bostrom, 2001). Vaiva et al. (2006) referred to the paper by Cedereke et al. (2002), and compared suicidal attempts between two interventions; one was a telephone call 1 month after discharge from the ED, and the other was a telephone call 3 months after discharge.

3.2.1.5. Composite of letter/postcard and telephone intervention. Recently, Kapur et al. (2013) developed a composite of contact-type interventions. This consisted of an information leaflet listing local and national sources of help, two telephone calls within the first 2 weeks, and then a series of letters over a 12-month period (at 1, 2, 4, 6, 8, and 12 months). The intervention was developed using qualitative interviews and focus groups with service users and providers (Kapur et al., 2010). Contrary to the preventive effect of postcards shown in studies by Carter et al. (2005, 2007, 2013), the trial showed increased rates of repeat suicide in the intervention group compared with the established treatment control group.

3.2.2. Psychotherapy group

Several different approaches were reported, including cognitive therapy (Brown et al., 2005; Ghahramanlou-Holloway et al., 2012; Wei et al., 2013), problem-solving approach (Bannan, 2010; Gibbons et al., 1978; McLeavey et al., 1994), psychodynamic interpersonal therapy (Guthrie et al., 2001), cognitive analytic therapy (Ougrin et al., 2011), insight-oriented therapy and behavioral therapy (Lieberman and Eckman, 1981), and cognitive behavioral method to enhance compliance (Raj et al., 2001). Some trials focused only on changes in psychometric outcomes and did not examine suicidal deaths and repeat suicide attempts (Ougrin et al., 2011; Raj et al., 2001; Waterhouse and Platt, 1990).

3.2.3. Pharmacotherapy group

A study examined differences in rates of repeat suicide attempts between patients without schizophrenia who had repeated suicide attempts and were treated with very low-dose