

Evidence Check

Suicide aftercare services

An **Evidence Check** rapid review brokered by the Sax Institute for the NSW Ministry of Health.
October 2019.

This report was prepared by:

Fiona Shand, Alan Woodward, Katherine McGill, Mark Larsen, Michelle Torok, Annie Petheridge,
Hannah Rosebrock, Tegan Cotterill, Alex Hains

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Enquiries regarding this report may be directed to the:

Principal Analyst
Knowledge Exchange Program
Sax Institute
www.saxinstitute.org.au
knowledge.exchange@saxinstitute.org.au
Phone: +61 2 91889500

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Disclaimer:

This **Evidence Check Review** was produced using the Evidence Check methodology in response to specific questions from the commissioning agency.

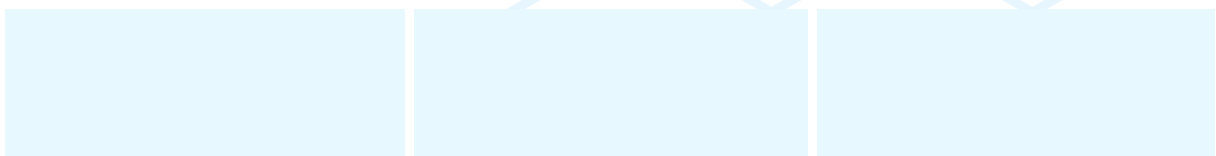

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Glossary of terms

Assertive aftercare or assertive follow-up: assertive aftercare typically consists of assertive and rapid follow-up, case management and motivational support to remain in treatment. The term 'assertive' refers to the notion that the care provider is responsible for maintaining contact with the client or patient.

Brief intervention: Brief interventions typically provide a limited number of sessions (usually fewer than six) and/or sessions of limited duration (10-20 minutes).

Brief contact intervention: supportive messages sent via postcard, text message or letter; they do not offer therapy.

Brief intervention and contact: Combines supportive messages with a brief therapeutic intervention.

Treatment as usual: The treatment that patients would normally receive if they were not involved in a research trial.

Continuity of care: the provision of high-quality care over time, often provided by the same health care provider or team of providers.

Therapeutic alliance: The therapeutic alliance consists of three elements: agreement on the goals of the treatment, agreement on the tasks, and the development of a personal bond between therapist and client that is made up of reciprocal positive feelings.

Abbreviations:

ACTION-J: Assertive case management in Japan

ALGOS: An algorithm for determining patients' treatment pathways

ASSIP: Attempted Suicide Short Intervention Program

BCI: Brief contact intervention

CAMS: Collaborative Assessment and Management of Suicidality

ED: Hospital emergency department

ICM: Intensive case management

LSCSP: Lifeline Suicide Crisis Support Program

PHN: Primary Health Network

RCT: Randomised controlled trial

SUPRE-MISS: Suicide Prevention: Multisite Intervention Study on Suicidal Behaviours

TAU: Treatment as usual

TWBSS: The Way Back Support Service

Executive summary

Background

Improving the care received by people after a suicide attempt is a high priority for reducing suicide attempts and suicide deaths, as a suicide attempt is the most significant risk factor for further suicidal behaviour. The relative risk for suicide after attempted suicide is between 20 to 40 times higher than in the general population. Supporting people after a suicide attempt or self harm is critically important and highlights the importance of viewing a suicide attempt within the person's broader psychosocial needs and responding with effective and empathic care. Follow-up immediately after discharge represents an opportunity to provide much needed treatment and support to the individuals, family and caregivers. There is increasing evidence that following up and increasing community support for patients after a suicide attempt can reduce the likelihood of a further attempt, particularly if this is combined with a treatment program.

Aftercare is designed to increase access to and engagement with care to prevent repetition of suicidal behaviour or self-harm. Reform efforts are gathering pace in Australia, with many hospitals undertaking quality improvement processes and adopting new models of care. Across the country, various models of aftercare are being implemented, including non-clinical and community-based services. Most of these services are evidence-informed but are yet to be comprehensively evaluated.

Review questions

This review aimed to address the following questions:

Question 1:

Which suicide aftercare services have been found to be effective in reducing further suicide attempts?

Question 2:

From the services identified in Question 1, what components of the services have been determined to contribute to services' effectiveness?

Summary of methods

Both the peer review and the grey literature were searched for relevant material published between January 2013 and April 2019. Thirty papers met the criteria for inclusion in the review. Of these, six were of high quality, 18 were of moderate to high quality and six were of moderate quality.

A desktop search was conducted for relevant grey literature. This included searches of relevant websites, a google search, contacting Australian aftercare services and contacting international experts. This process yielded five evaluation reports.

Key findings

Question 1:

The interventions identified in this review can be categorised into three types: brief contact interventions, brief interventions and assertive aftercare. Assertive aftercare models and brief interventions both appear to reduce the proportion of people who reattempt suicide compared with a control condition (mostly treatment as usual). Assertive aftercare means that the person's case manager is responsible for maintaining contact, rather than relying on the person to make contact with the service. It may also require using a range of methods to maintain contact, such as home and other off-site visits, telephone calls and texts. Note

that not all of aftercare services would be defined as 'assertive'. Brief interventions typically provide a limited number of sessions (usually fewer than six) and/or the sessions were of limited duration (10-20 minutes). The duration of the effect of each model is unclear, with very few studies following up participants beyond 12 months. The impact on suicide deaths is also unclear.

The range of models examined was quite broad, but assertive aftercare typically consists of assertive and rapid follow-up, case management and motivational support. Brief interventions also varied but are defined by a limited number of sessions, usually of short duration, with a significant proportion of sessions delivered via telephone. They do not include case management and most do not involve therapy. In most trials, participants were referred directly from the emergency department (ED), although some trials recruited from inpatient psychiatric units. Thus, many participants did not receive inpatient care before referral to the aftercare service.

Brief contact interventions (supportive messages via postcard, text message or letter) do not offer therapy. In a systematic review and meta-analysis brief contact interventions have been found to reduce the incident rate of repeat suicide attempts or self-harm, but not the proportion of people who have a suicide attempt.

Question 2:

While there was no research specifically addressing the components that contribute to effectiveness, there were some features that were common to effective models. These included:

- Rapid follow-up with greater frequency in the first month post-discharge
- A strong focus on therapeutic alliance, engagement, and continuity of care
- Providing the first session face-to-face (where telephone follow-up is part of the service model)
- Addressing a wide range of psychosocial needs, involvement of a support person and integration with clinical care.

Gaps in the evidence

To date there are no available rigorous evaluations of Australian aftercare services. With the exception of young people, we did not find any studies examining the effectiveness of aftercare for priority populations including Aboriginal and Torres Strait Islander people, LGBTQI+ people and older people. There is little research that identifies the components of effective care, and little rigorous research regarding the effect of including peer support in aftercare models, although service users have identified this as a valuable part of their care.

Several studies identified that their model was less effective for men, or that men were less likely to engage with services than women. More research is needed to learn what works best for men in suicide aftercare. More broadly, given the need to engage people in services in order for them to be effective, more work is needed to understand how to create and maintain people's engagement with aftercare services.

Discussion of key findings

Question 1:

The research establishes consistently that dedicated crisis response, aftercare services and support following a suicide attempt are effective in reducing subsequent suicide attempts. Both brief interventions and more intensive case management models have demonstrated effectiveness in reducing repeat suicide attempts. Brief contact interventions (letters, text messages, postcards) may be best used as a follow-up to other programs once the client has been stabilised and has established a connection with a clinician or other service provider. Regardless of the intensity of other interventions, the key variables appear to be the timeliness of the service offered and the characteristics of the service in character and quality, that is, the extent to which genuine and human connection is established with a suicidal person, and with their carers, to enable progression in other service dimensions. This finding is consistent with the limited research

knowledge on service preferences from people with lived experience of suicide attempts, although research clearly reinforces the importance of preventing negative experiences with hospital and health services, and the benefit of engagement with personnel who can demonstrate non-judgemental, compassionate and helpful attitudes towards a person who has survived a suicidal crisis and possibly an attempt to end their life.

Question 2:

The components of effective care are inferred from examining the common components of models that have been shown to reduce suicide attempt risk in randomised controlled trials. With one exception, there has been no examination of mediating factors. This factor, client-rated therapeutic alliance, consistently emerges as predictive of better outcomes across a range of therapeutic models and disorders. It is likely related to ongoing client engagement and retention in treatment, which is in turn related to better outcomes for the client. Although it has implications for defining what type of services should be offered, it has further implications for how services are managed, the type of culture that is established and supported within the service organisation, and for how frontline/client-facing staff are supported in their difficult work. Some of the factors identified as contributing to effective service models are connected, that is, engagement, therapeutic alliance, continuity of care, face-to-face care, rapid follow-up and the qualities of the staff. From qualitative research, some other features identified as contributing to effectiveness were flexibility in the service model, meeting people prior to discharge or in their home environment, and having a focus on actions that assist people to have greater integration across their lives. The range of staff providing care was broad and included psychiatrists, mental health and psychiatric nurses, psychologists, doctors, social workers, and in two studies, peer workers. There was no discernible difference in outcomes based on the formal qualifications of the person providing care.

Conclusion

There are encouraging results from research on the benefits of planned, systematic follow-up contact, especially in the period surrounding discharge from acute care and the return to community. Brief contact appears to be an effective technique for demonstrating to the suicidal person that there are supports available and for reinforcing the offer of social connectedness with care providers/clinicians, which may have been lost or severely diminished at the time of the suicidal crisis, and may be most effective once a therapeutic relationship is established between the client and clinicians.

Brief interventions that are integrated with clinical services or that provide therapy in addition to ongoing contact also show promise. Integration of non-clinical services and general support services with improved coordination of clinical care and treatment programs appears to be the more effective model of service in terms of benefits to an individual's quality of life and motivation, but also in achieving observable changes in suicidal behaviour.

At the heart of all responses the need for empathic and respectful interactions with the person who has attempted suicide and their families and carers is essential as a measure of service quality. Careful and person-centred processes must therefore be adopted.

Background

Research has for many years established that people who have attempted to end their lives are at increased risk of a subsequent suicide attempt in the period immediately surrounding and shortly after hospitalisation. Improving the care received by people after a suicide attempt is therefore a high priority for reducing suicide attempts and suicide deaths, as a suicide attempt is the most significant risk factor for further suicidal behaviour. Within nine years of a suicide attempt, three to 12% of individuals will have died by suicide.¹ Moreover, the relative risk for suicide after attempted suicide is between 20 to 40 times higher than in the general population², such that responding with support and services after a suicide attempt or self harm is critically important. For all persons who present to emergency departments following deliberate self-harm, the one-year repetition rate is 15%, or 30% if the individual has a prior history of deliberate self harm; the suicide mortality rate is around 1% in one year.^{1, 2}

For those who are hospitalised following a presentation to the emergency department, the one-month period after discharge from psychiatric inpatient care is one of the most dangerous periods for further suicidal behaviour, with reports that 47% of suicide deaths occur within the month after discharge, and 43% before the first follow-up appointment.³ In Australia, the Stokes Review identified that 15% of the men who had been admitted to a psychiatric hospital or a public hospital for psychiatric treatment for a suicide attempt died by suicide on the day of discharge.⁴ Similarly, one-fifth of women who died by suicide did so on the day of discharge, and a third within a month of discharge.⁴ Around one-third of men and over half of women who died by suicide had also been hospitalised previously for self-inflicted injuries. However, while the risk for future suicide attempt is highest in the immediate post-discharge period, this risk can remain elevated over a sustained period, as longitudinal studies with follow-up periods of up to 20 years still show risk.⁵ Accordingly, the weeks after discharge from hospital are a critical timepoint for engagement with a suicidal person and the provision of treatment, with assertive and timely follow-up an important element in preventing suicide.

The high rate of repetition of suicide attempts has implications for how emergency departments and community services respond. Follow-up immediately after discharge represents an opportunity to provide much needed treatment and support to the individuals, family and caregivers. There is increasing evidence that following up and staying connected to patients after a suicide attempt can reduce the likelihood of a further attempt, particularly if this is combined with a treatment program.⁶⁻¹⁰ Studies which have found no effect of follow-up after a suicide attempt were generally evaluations of strategies where the follow-up was not coordinated with treatment.¹¹⁻¹³

While follow-up and care after discharge is an important component of preventing further suicide attempts, a 2015 study¹⁴ found that care following a suicide attempt is inconsistently delivered. That is, of more than 42,000 individuals admitted for deliberate self-harm between 2005-2011, only 41% received any contact with a community mental health service in the 30 days after discharge.¹⁵ Moreover, of those who did receive contact, the majority received only a single contact with a mental health nurse of less than 30 minutes.¹⁴ Patient and carer surveys and interviews revealed low levels of satisfaction with the care received following a suicide attempt, with many people being left to navigate their own way through a complex health system, failing to receive follow-up care at all, or not receiving care that was promised at discharge. Dissatisfaction with the first point of contact predicted the likelihood of seeking help for future suicidal crises. Satisfaction with care decreased over time, with many patients stating that they needed longer-term support.¹⁶ These findings are in direct contrast to jurisdictional policies that state that all patients should receive follow-up contact; and yet, this is an experience that is reported across all Australian jurisdictions.

Aftercare can provide an important protective function if done well. Aftercare is designed to increase access to, and engagement with, care to prevent repetition of deliberate self-harm. Best practice aftercare typically comprises the following four key elements¹⁷:

1. Immediate and assertive follow-up after the person is discharged from hospital
2. Ongoing collaborative risk management and safety planning
3. Encouragement and motivation to adhere to treatment
4. Problem-solving/solution-focused counselling with links to practical supports and services to address issues in a person's life, such as housing, finances, relationships.

Several aftercare models now incorporate all or most of these principles, both in the international peer-reviewed literature, and in practice in Australia, as identified in our grey literature search. These models are described in detail in the subsequent sections of this report. Much of what is currently practiced in Australian aftercare services reflects both the international evidence base and what has been learned from the history of suicide aftercare services in Australia.

History of aftercare services in Australia

During 2006 and 2007, LifeLine conducted a pilot of follow-up support for help line callers at risk of suicide¹⁸ across five regions. The program linked callers up with experienced, specially trained telephone counsellors who called them regularly over an agreed period (up to eight weeks) to help the caller establish a short-term strategy for keeping safe, to provide care and encouragement and to support them to link in with formal or informal supports in the community. A mixed methods approach was used to independently evaluate the service. Findings showed positive responses from participants in the program with self-reported reductions in suicidality and increased motivation and use of resources including professional treatments.

An Australian study of intensive case management (ICM) compared to treatment as usual, with patients recently discharged from psychiatric inpatient care and considered at risk of suicide, found some benefits (increased engagement, reduced hospitalisation, reductions in symptoms of depression, suicidal ideation, and hopelessness) but no difference in suicidal behaviours.¹⁹ This null finding may be explained by the small sample size and the low number of repeat suicide attempts during the follow-up period (10 in total across the two groups).

A trial of supportive messages (postcards) sent at regular intervals by the patient's clinical team commenced during the same period, and demonstrated that brief contact interventions can reduce the incident rate of self-poisoning over a five-year follow-up period.²⁰ These were sent as part of a coordinated care model of responses to people presenting to hospital following self-harm behaviour at the Mater Hospital, Newcastle. This has complemented the clinical service coordination across disciplines in the hospital. The operation of the follow-up contacts has been subject to research studies using RCT methodologies and found to have positive effect in reducing the number of reattempts by individuals, although not overall reductions individuals making reattempts of suicide. The research also quantified the reduction in hospital bed days associated with the self-harm response program.

The Way Back Support Service (TWBSS) was piloted in Darwin, Northern Territory in 2014-15. The model was developed by Beyond Blue, in partnership with the service provider, Anglicare NT, and with local stakeholders and an advisory group. The service is based on the principles of rapid follow-up, safety planning and one-to-one support for three months post-attempt. More detail on these three studies is provided later in the report.

Reform efforts are gathering pace in Australia, with many hospitals undertaking quality improvement processes and adopting new models of care. Beyond Blue received \$38 million in 2018 to roll out The Way

Back Support Service in more regions. The outcomes from the Newcastle The Way Back Support Service trial are not yet available but are expected to be released by the end of 2019. Across the country, various models of aftercare are being implemented, as well as different models of care within the emergency setting. There are emerging non-clinical or community-based services including alternatives to the ED (e.g. safe havens and safe spaces with a less clinical focus) and increasing peer support workers for people experiencing suicidal crisis. These innovative models are evidence-informed, or have some international evidence, but need longer-term evaluation at the patient outcome level.

This Evidence Check has been commissioned by the NSW Ministry of Health to review the current evidence base to determine which aftercare services have been shown to be effective at reducing further suicide attempts, and to establish which components of aftercare contribute to the effectiveness of services. This literature search focuses on randomized controlled and quasi-experimental studies of models of care after attempted suicide or self-harm, with the aim of providing an overview of the current state of knowledge. The focus of this review, therefore, is to analyse and discuss the models and strategies chosen for each intervention and not to perform a statistical meta-analysis.

Methods

Peer review literature

An electronic literature search was made in April 2019 of all randomised controlled trials and quasi experimental studies purporting to examine the impact of aftercare interventions on people who have made a suicide attempt. Ovid was used to search the MEDLINE, PsycINFO and Cochrane Central Register of Controlled Trials databases. The following keywords were used: suicide ('suicid*' or 'self harm', or 'self-harm' or 'self injur*' or 'self-injur*' or 'self poison*' or 'self-poison*') AND aftercare ('after care' or 'aftercare' or 'community team' or 'continuity of care' or 'chain of care' or 'brief contact' or 'follow up' or 'follow-up' or 'followup') AND RCT ('randomis*' or 'randomiz*' or 'controlled' or 'quasi*'). Searches were run in title, abstract, keywords (.mp.). Duplicates were identified and removed via the Ovid web interface.

Searches were limited to literature published in English, from 2013 onwards (excluding seminal studies), which were from developed countries with similar health systems to Australia. No age limit was placed on the search. Studies with a focus on inpatient care, pharmacological treatments and clinical therapies (only) were excluded.

In total, 1639 abstracts were identified. Once duplicates were removed, 1532 titles and abstracts were reviewed. Of those, 1494 were removed because their titles and abstracts indicated they were not relevant to the topic of suicide aftercare interventions. This resulted in 38 articles to be screened at the level of full text for eligibility. In addition, five other relevant studies from other sources were included, bringing the total to 43 articles. Discussions between the reviewers resolved discrepancies in inclusion and a further 13 articles were excluded. A total of 30 articles were included in the review. A flowchart of the literature selection process is included as Appendix 1.

Included studies

Thirty papers met the criteria for inclusion in the review. Of these, six were of high quality, 18 were of moderate to high quality and six were of moderate quality.

A summary table of the included studies is attached as Appendix B.

Grey literature

A desktop search was conducted in April 2019 for relevant grey literature. We used four processes to identify relevant literature:

1. A Google search using the search terms suicide, attempt, support and evaluation or report. The first 10 pages returned were searched for relevant documents. This process identified one report, the Way Back Support Service Northern Territory evaluation
2. We emailed 20 Australian aftercare services to request any evaluations completed for their service. We received replies from 13 services which yielded two research reports and two presentations containing some preliminary findings
3. We searched the websites of the following health and suicide prevention agencies for relevant reports and documents:
 - Suicide Prevention Hub – Best Practice Programs and Services <https://suicidepreventionhub.org.au/programs> (Australian site)
 - Suicide Prevention Resource Center <https://www.sprc.org/> (including the Best Practices Registry) (US site)
 - World Health Organization <https://www.who.int/> (international site)

- Substance use and Mental Health Services Administration <https://www.samhsa.gov/> (SAMHSA) (US site)
- National Action Alliance <https://theactionalliance.org/> (US site)
- American Foundation for Suicide Prevention for Suicide Prevention <https://afsp.org/> (US site)
- Lifeline Canada Foundation <https://thelifelinecanada.ca/resources/> (Canadian site)
- Mental Health Commission of Canada <https://www.mentalhealthcommission.ca/English> (Canadian site)
- European Commission https://ec.europa.eu/info/research-and-innovation_en (European site)
- National Mental Health Commission <https://www.mentalhealthcommission.gov.au/> (Australian site).

4. We emailed key international suicide prevention experts and academics requesting information about unpublished evaluations of suicide aftercare services and models.

Several services have advised that they are commencing or undertaking evaluations in the next six to 12 months. The Way Back Support Service Newcastle evaluation is due for public release late in 2019. Appendix C provides an overview of the evaluation status for each of the services that responded. In the next two to three months, Beyond Blue will be releasing a request for proposal to evaluate their national rollout of TWBSS.

From the website searches, four relevant documents were found (on the Suicide Prevention Resource Center and the SAMHSA website). One described an evaluation (*Emergency Room Intervention for Adolescent Females*, excluded), one was a guideline (*SAMHSA Practice Guidelines: Core Elements for Responding to Mental Health Crises*, excluded), one was a technical package (*National Centre for Injury Prevention and Control report, Preventing Suicide: A Technical Package of Policy, Programs, and Practices*, excluded) and one was a qualitative examination of healthcare pathways (*AISRAP Pathways to Care: To examine the mechanisms in place across Australia to respond to and provide care to people at imminent risk of suicide*, excluded)

Several Australian reports were provided by CI Woodward from his personal collection: an evaluation of a LifeLine Suicide Crisis Support Program Pilot (2008) by University of Canberra (described in the introduction) and a 2008 report on a randomised controlled trial of intensive case management in Australia (included as a seminal study).

Findings

Systematic reviews: overall findings from the peer reviewed literature

Six systematic reviews since 2013 have identified that dedicated care and follow-up after a suicide attempt is effective in reducing the number of people who will have a subsequent suicide attempt. Three of the reviews used meta-analysis to combine data from the studies and estimate an overall effect on repeat self-harm/suicide attempts. A systematic review and meta-analysis by Inagaki et al.²¹ showed that 'active contact and follow-up type interventions' (aftercare, nine trials) were effective in preventing a repeat suicide within 12 months in patients admitted to EDs for a suicide attempt (Relative Risk [RR]=0.83, 95% Confidence Interval [CI] 0.71-0.97). However, the effect at 24 months was not confirmed, in part because there are few studies that have followed up participants beyond 12 months.

It is not possible to attribute an overall reduction in suicide rates to aftercare and follow-up services. The effects of the interventions in preventing death by suicide were not confirmed because the number of trials assessing suicide deaths has been too small to detect significant differences. Moreover, the wide range of service types and configurations in trials undermines broader comparisons on suicide prevention in terms of deaths and suicide rates. Studies in this category included intensive care and outreach; brief interventions and contact; and brief contact (letter/postcard; phone; and composite phone and letter/postcard). The study examined other strategies, including psychotherapy, pharmacotherapy, and referral for alcohol and other drug treatment, concluding that the effects of the other types of interventions in preventing suicidal behaviour repetition remains unclear.

An updated review by the same authors was published in 2019 with new studies added, bringing the number of included aftercare studies to fourteen.²² Similar findings emerged (RR=0.82, 95% CI 0.69-0.98), although the addition of the Hatcher studies^{23, 24}, which found no effect on suicide reattempt (due largely to methodological issues) reduced the significance of the 12 month outcomes (RR=0.86, 95% CI 0.73-1.02).

The third meta-analytic study evaluated the effect of brief contact interventions on repetition of self-harm, suicide attempt or suicide.²⁵ Eleven studies (n=8,485 people) were included for meta-analysis comparing the effect of the intervention on repetition of self-harm at the longest follow-up time point. The overall pooled odds ratio (OR) was 0.87 (95% CI 0.74-1.07, p=.01). Studies with a follow-up timepoint of 12 months or less after the index episode had a pooled OR for self-harm or suicide attempt in the intervention group compared to the control group of 0.81 (95% CI 0.58 to 1.13, p=0.215). For studies with a follow up time point greater than 12 months the pooled OR for self-harm or suicide was 0.91 (95% CI 0.75 to 1.10, p=0.321). The analysis identified a 34% reduction in the number of presentations to hospital or health services for suicide reattempt per person per year (IRR=0.66, 95% CI 0.54-0.8, p=.001) for those allocated to the intervention groups. The odds of suicide were lower, but not significantly so, for intervention groups (OR=0.58, 95% CI 0.24-1.38, p=.22). Although the meta-analysis suggested lower odds ratios of any episode of self harm or attempted suicide among those receiving the intervention compared with controls, the result was not significant (which may be due to methodological factors such as sample size). The authors concluded that brief contact interventions are promising but that a large-scale trial in a clinical population is needed before they would recommend wide roll-out.

The remaining three systematic reviews provided narrative analysis only. Like Milner et al.²⁵, Luxton²⁶ examined the effects of brief contact interventions (including letters, postcards, phone contact, visits or email) for people who had presented to hospital (ED or psychiatric units) for suicidal behaviour. Eleven publications met inclusion criteria for eight trials. Three of eleven studies showed a statistically significant reduction in repeat self harm and two studies showed that it prevented deaths by suicide. Four studies,

including one of the follow-up studies and a study reporting secondary analyses, showed mixed or non-conclusive results but did show trends toward preventative effect. Two studies did not show preventative effects. Overall, the studies provide evidence that this type of post-discharge follow-up can be effective in reducing suicide deaths, attempts and ideation.

Falcone et al.²⁷ completed a narrative review that summarised the results of 23 publications (1977-2016) investigating the effect of brief contact interventions (text messages on repeated self-harm or suicide, for people discharged from ED or psychiatric units). Key findings are consistent with the above two systematic reviews: about half of the studies (11 of 23 publications) have shown that brief contact interventions decrease risk of reattempts in the post discharge period. Ghanbari et al.²⁸ investigated whether interventions delivered by phone or other means (postcards, email, case management) are effective in reducing reattempts after a person is discharged from hospital after a suicide attempt. Twelve out of 25 studies reported a decrease in suicidal behaviours covering interventions involving visits, letter, phone, postcards, crisis lines and case management.

The interventions described below are diverse in terms of their duration (two to 24 months) and of who provided the care, which included mental health, psychiatric, and general nurses, psychologists, psychiatrists, doctors, and social workers. There were no discernible relationships between duration, staff qualifications and patient outcomes. Most (15) of the studies included in this review recruited participants through the emergency department, or through a combination of emergency departments and inpatient units (usually psychiatric units).

Duration of outcomes

There have been two studies that have followed up patients for five years, with one finding that the differences between the intervention group and the control group disappeared at three to four years.²⁹ In this study assertive aftercare was provided for a period of six months. At the five-year follow-up, 16 of the 69 people in the intervention group had made a suicide attempt and 19 of the 64 people in the control group had made a suicide attempt, meaning that the difference between the two groups in terms of proportion who made a suicide attempt was no longer significant. The rate for both groups was nevertheless quite low, and the sample size was small, so that a detectable difference between the two groups was less likely. The difference in the number of suicide attempts between the two groups remained significant. In another long-term follow-up of people who received a less intensive intervention (brief telephone follow-up)³⁰, the difference between the two groups was no longer significant at 18 months. However, there was a significantly reduced number of overall self-harm episodes during the whole study period of approximately 12% amongst the intervention group. The number of patients who had a repeat self-harm episode was not significantly different between groups. The effects of the interventions in preventing death by suicide has not been confirmed yet, because the number of trials assessing suicide deaths has been too small to detect significant differences. In one study where initial contact was via three intensive face-to-face sessions and there was low intensity follow-up via letter for 24 months, effects were sustained for the 24-month period. Although it is tempting to conclude that more intensive interventions produce more sustainable outcomes, it is difficult to do so based on three studies where the intensity of intervention was not directly compared.

Question 1: Which suicide aftercare services have been found to be effective in reducing further suicide attempts?

Most studies reviewed to answer this question were rated as Level II using the NHMRC hierarchy of evidence (2009). The discussion regarding effective services and models is categorised below into three types: brief contact interventions, brief interventions and assertive aftercare. Table 1 provides an overview of the programs that have evidence of effectiveness in reducing suicidal behaviour.

Brief contact interventions

This approach focuses on the provision of outreach and contact with suicidal persons following their engagement with hospital and short-term specialist health services. Generally, their intention is to encourage patient engagement with longer term services and adherence to treatment programs. Simple communication such as the health clinic or an assigned clinician sending a letter, or making a phone call, have been utilised. More recently, SMS mobile phone messages and peer worker phone calls have been trialled.

This type of service is examined in the seminal study by Motto and Bostrom.⁹ In this study, a randomly assigned sample of 843 participants received a simple follow-up contact letter at least four times a year for five years following treatment for a suicide attempt, with the control group receiving no such contact. The results showed that participants in the intervention group had lower suicide rates throughout the study, with the greatest effect occurring during the early years.

The simple mechanisms of communication may have an intrinsic value by showing the suicidal person that someone cares and that their situation is of concern to others; it may also be that the continued communication facilitates use of other services and treatments that directly reduce suicidal behaviour. The research studies, however, are not clear on the causal mechanisms.

Three brief contact intervention studies have been published since 2013. Consistent with the systematic review described previously²⁵, two of the three studies found an effect on either the proportion of participants with a repeat suicide attempt, or the number of repeat events in the intervention group compared to the control group. One study was a five-year follow-up of an earlier study²⁰ that replicated the findings of the original caring contacts study.⁹ One study³¹ relied on hospital records to measure suicide attempts and so may have underestimated the number of suicide attempts in favour of the control group.

A *caring contacts* intervention with serving military personnel who had ideation or had made a suicide attempt was found to reduce suicide attempts compared with treatment as usual (TAU).³² This intervention and its outcomes are described in more detail under the '*Models that have been tailored for Priority Populations*' heading, but also included 24 hour a day monitoring of reply messages, with a telephone call in response if necessary.

In an early brief contact study in Australia (*Postcards from the EDge*)²⁰, eight postcards containing a simple message were sent in a sealed envelope in months 1, 2, 3, 4, 6, 8, 10 and 12 after discharge, to patients who had self-poisoned. There was no difference in the proportion of participants with repeat self-poisoning (24.9% vs. 27.2%). The group receiving the postcards had a reduced incident rate of self-poisoning over a five-year follow-up period (IRR 0.54, 95% CI 0.37-0.81). The intervention was found to be more effective for women.²⁰ This was the only study of the three reviewed here to examine outcomes by sex.

In the *Messages from Manchester* trial, an information leaflet listing local and national sources of help was mailed as soon as possible after consent, with two telephone calls within the first two weeks and then a series of letters over a 12 month period (at 1, 2, 4, 6, 8 and 12 months).³¹ After hours care was provided by duty psychiatrist. At 12-month follow-up, the intervention participants had a higher risk of self-harm. After adjustment for baseline clinical factors this difference was not significant. Only hospital-treated episodes of repeat self-harm were recorded so self-report was not captured, and it is possible that the intervention group were more likely to seek help for subsequent self-harm, since they were encouraged to do so. The first follow-up contact did not occur until at least three days after discharge. The telephone calls were to facilitate access to treatment but were not assertive, for instance, checking they had contact details for services.

Table 1: Summary of program with demonstrated effectiveness to decrease suicidal behaviour (level II evidence)

Program / intervention description	Studies – author, year	Key components* addressed
Intervention type: Brief intervention		
Supportive telephone calls for youth – Multiple telephone calls 1, 7, 14, 30, 60, 90 days post discharge. Separate calls made to guardian	Rengasamy & Sparks, 2019 ³⁸	<ul style="list-style-type: none"> • Rapid assertive follow-up with greater intensity in the early weeks • Involvement of a support person
ASSIP – Three therapy sessions using narrative interviewing followed by tailored letters for 24 months	Gysin-Maillart et al., 2016 ⁵⁶ ; Michel et al., 2017; Park et al., 2018 ⁴⁹	<ul style="list-style-type: none"> • Rapid assertive follow-up with greater intensity in the early weeks • Initial face-to-face contact • Focus on therapeutic alliance, continuity of care and engagement • Using a range of strategies • Intensive case management and assertive follow-up • Addressing a wide range of psychological needs
BIC – Brief Intervention and Contact (phone calls or visits)	Fleischmann et al., 2008 ⁴⁰	<ul style="list-style-type: none"> • Rapid assertive follow-up with greater intensity in the early weeks • Initial face-to-face contact • Integration with clinical care • Engagement and continuity of care • Intensive case management • Addressing a wide range of psychological needs
Follow-up telephone calls - Six calls made over a 12-month period by trained psychologists/ counsellors, identifying risk factors, clarifying values and goals, safety and future planning,	Cebria et al., 2013, 2015 ^{30,37} ⁽¹⁾	<ul style="list-style-type: none"> • Assertive follow-up • Initial face-to-face contact commenced in the ED • Continuity of care • Support to engage with treatment • Range of psychosocial needs

⁽¹⁾ Superiority of intervention observed at 12 months was not maintained at the five-year follow-up. Note also that this study used historical controls rather than using a randomised controlled trial design.

Program / intervention description	Studies – author, year	Key components* addressed
facilitating treatment engagement/adherence, and facilitating significant-other problem solving		
Follow-up telephone calls - Three telephone calls made by a nurse over a 60-day period. Letters sent to those who couldn't be contacted by telephone	Exbrayat et al., 2017 ³⁶	<ul style="list-style-type: none"> • Assertive follow-up
Buddy delivered intervention – 'Buddy' attends three four hour workshops covering info sharing, feedback, management of challenges, coping skills, counselling strategies & info on how to facilitate further care or support; 'buddy' engages in regular follow-up (as per assessment timepoints)	Naidoo, Gathuram & Schlebusch, 2014 ⁴²	<ul style="list-style-type: none"> • Face-to-face contact • Involvement of a support person (intervention delivered by support person) • Engagement and continuity of care
ICM – Intensive Case Management including weekly face-to-face sessions with a case manager and two calls per week from a LifeLine counsellor for a period of 12 months	De Leo and Heller, 2007 ⁴¹	<ul style="list-style-type: none"> • Face-to-face contact • Engagement and continuity of care • Intensive case management and assertive follow-up • Addressing a wide range of psychological needs • Using a range of strategies
Intervention type: Assertive aftercare and case-management		
OPAC	Hvid et al., 2011 ⁴⁵ ; Lahoz et al., 2016 ^{29,48}	<ul style="list-style-type: none"> • Rapid follow-up with greater intensity in the early weeks • Face-to-face contact • Engagement and continuity of care • Intensive case management and assertive follow-up

Program / intervention description	Studies – author, year	Key components* addressed
		<ul style="list-style-type: none"> • Addressing a wide range of psychological needs
ACTION-J – Assertive case management in Japan, including assessment, planning, encouragement and coordination.	Kawanishi et al., 2014 ⁴⁶ ; Furuno et al., 2018 ⁴⁷	<ul style="list-style-type: none"> • Rapid and assertive follow-up • Face-to-face contact • Involvement of a support person • Engagement and continuity of care • Intensive case management • Addressing a wide range of psychological needs • Using a range of strategies
Intervention type: Brief contact intervention		
Caring Contacts (postcards)	Carter et al., 2015 ^{20,25}	<ul style="list-style-type: none"> • Continuity of care
Caring Contacts with serving military (eight postcards over a 12-month period including 24 hour a day monitoring of reply messages, plus TAU)	Comtois et al., 2019 ³²	<ul style="list-style-type: none"> • Continuity of care

* *Key components taken from the review findings (Appendix D)*

- Rapid (and assertive) follow-up with greater frequency in the first month post discharge (present in seven out of 10 effective models)
- Strong focus on therapeutic alliance
- Case management (present in four out of 10 effective models)
- Engagement and continuity of care (present in eight out of 10 effective models)
- Face-to-face contact / initial face-to-face contact (present in seven out of 10 effective models)
- Addressing a wide range of psychosocial needs
- Involvement of a support person (present in four out of 10 effective models)
- Integration with clinical care.

Brief interventions

Brief interventions are different to brief contacts and may be classified as such because they provide a limited number of sessions (usually fewer than six) and/or the sessions are of limited duration (10-20 minutes). These sessions provided face-to-face or by telephone, were often followed by a series of letters, postcards or texts. The models examined provided little or no case management. The content of the telephone or face-to-face sessions varied across models. Ten models were classified as brief interventions. Of these, six found a significant reduction in repeat suicide attempts at follow-up compared with a control condition (most often treatment as usual), and four found no difference. Three of those null findings may be partly due to methodological issues, including how the suicide attempt outcome was measured.^{23, 24, 33} One delayed follow-up until 10 days post-discharge.³⁴

Supportive telephone calls for adults who had attempted suicide

Each of these three studies demonstrated a reduction in suicide attempts at the 12-month follow-up compared with a control condition.^{35, 36} One study followed participants up to five years and found that there was no longer a difference in outcomes between the intervention and control group.³⁰

A series of supportive telephone calls to the participant for 52 weeks following the index ED visit significantly reduced the rate of repeat suicide attempts during the 12-month intervention phase compared with the two 12-month historical control phases.³⁵ During the 12-month intervention phase, 18% of participants had a repeat suicide attempt compared with 22% and 23% respectively during the two 12-month historical control phases (treatment as usual and screening). The phone calls focused on identifying risk factors, clarifying values and goals, safety and future planning, facilitating treatment engagement/adherence and facilitating significant-other problem solving. The calls were provided by specially trained psychologists and counsellors. Of note, safety planning commenced before patients left the ED.

An intervention consisting of three follow up phone calls at days 8, 30 and 60 resulted in 33% fewer suicide attempts in the intervention group compared to the control group at 12 months.³⁶ During the calls, a trained nurse completed a three-item scale covering suicide risk, emergency and degree of harmfulness, and medication compliance. Letters were sent if the participant could not be contacted. For those who responded to all phone calls, the risk of reattempt was lower.

A different approach involved a mental health nurse who contacted patients who had presented to the ED for a suicide attempt. During the call, the nurse arranged a post-discharge appointment with the referring psychiatrist within 10 days. Participants then received telephone calls from a mental health nurse for 12 months, which resulted in a difference in the number of patients who reattempted and a longer time to first reattempt during the first 12 months but not at five years.^{30, 37} Follow-up calls to patients were made at one week, one month, and at 3, 6, 9 and 12 months after discharge. The telephone intervention had three phases: (1) an initial 15-20 minute telephone contact at week one, including a presentation by the case manager, an explanation of the intervention, a request for explicit verbal informed consent to continue participating in the program and a short re-assessment of the current risk of suicide; (2) a 5-10 minute telephone follow-up at 1, 3, 6, 9 and 12 months focused on the same data and looking for any significant changes; and (3) a 15-45 minute crisis intervention tailored to the patient's clinical characteristics and personal situation.

Multi-call intervention for adolescents (12 - 18 years) hospitalised for suicidal ideation or attempt

For adolescents aged 12-18 years who had been hospitalised for suicidal ideation or attempt, six brief telephone calls in addition to treatment as usual over a period of 90 days led to fewer incidents of suicidal behaviour compared to the group that received a single phone call (OR=0.28, 95% CI=0.09-0.93, p=0.037).³⁸ Each phone call was of 10-20 minutes duration and covered a suicide risk scale, a review of the participant's

confidence in safety plan, goals, helpfulness of intervention and elicitation of reasons for living. Guardians also received telephone calls in the multi-contact group, including a review of parental concerns regarding suicidality and treatment follow-up. The six contacts occurred with decreasing frequency over time (1,7, 14, 30, 60, and 90 days post discharge). A single telephone call occurred at 90 days post discharge.

Tailoring for patients with one suicide attempt vs. multiple suicide attempts

One study used a monitoring algorithm (known as ALGOS) to assign patients to interventions of varying intensity (described below) and did not result in a difference in the rate of reattempt between intervention and control groups overall^{34, 39}:

1. Patients presenting with their first suicide attempt received a crisis card at discharge, showing a toll-free number that could be called 24/7
2. Patients with more than one suicide attempt received a phone call from a dedicated team of trained psychologists on behalf of the initial attending team between day 10 and day 21 after the attempt. Phone contact aims were: (1) to provide psychological support and assess patient's mental health state, (2) to evaluate the patient's adherence to a post-discharge healthcare plan, and (3) to encourage the patient to make new contacts with his/her healthcare providers. If the patient could not be reached after three attempts on three different days and times, post-cards were sent at months 2, 3, 4 and 5. If the patient could be reached, but was in distress or suicidal crisis, and/or did not adhere to the post-discharge treatment, post-cards were sent at months 2, 3, 4 and 5. For patients in distress or suicidal crisis, an emergency consultation was set up within 24 hours at the centre where they had attended for their suicide attempt.

At six and 13 months the first attempt intervention group were less likely to reattempt than those in the control group. Patients with multiple attempts who received a crisis card instead of a phone call had a higher risk of suicide attempts at six months. Early and frequent contact is suggested by authors as necessary for effective prevention of subsequent suicide attempts.

A combined clinical and brief contact intervention

Research on service models that integrate post-hospital/discharge coordination of clinical services with non-clinical support and follow-up services has suggested the most promising results. Indications are that intensive case management with follow-up supports is beneficial in assisting the post-discharge phase of high-risk psychiatric patients. Overall, the ability to link referrals to clinical treatments as well as address the engagement and psychosocial support elements of recovery from a suicidal crisis seems to create an effective model of service in a multi-faceted manner.

A key study by Fleischmann et al.⁴⁰ in a World Health Organisation publication has been used to promote brief time-limited interventions post suicide-attempt as an effective response mechanism in suicide prevention. This study, which recruited a large number of participants – 1867 from five countries with a dropout rate of 9% – involved a brief intervention consisting of the following: a one hour individual session at the time of discharge and nine follow-up contacts by phone or personal visits over an 18 month period. This allowed for exploration of the person's suicidality, issues causing distress in their lives and referrals to appropriate intensive treatments where a need was identified. This study, accordingly, represented a basic integrated model of clinical and non-clinical care (psychosocial counselling) using a systematic follow-up process with patients. The results of the study found significantly more patients in the treatment as usual (TAU) group died by suicide post-initial attempt to those in the brief intervention and contact group.

The Attempted Suicide Short Intervention Program (ASSIP) in addition to treatment as usual (TAU) found that intervention participants had an 80% reduced risk of making at least one repeat suicide attempt at 24 months, compared with treatment as usual. ASSIP is a brief therapy (three sessions) based on a patient-centred model of suicidal behaviour with an emphasis on early therapeutic alliance. It used a narrative

interviewing technique, combined with psychoeducation, cognitive case conceptualisation, safety planning and continued long-term outreach contact through personalised letters. Therapy was provided by a psychiatrist and three psychologists who underwent a week of intensive training to deliver the manualised ASSIP intervention. The duration was 24 months. Letters were sent every three months in the first year and every six months in the second year. Therapeutic alliance was a moderating factor: higher scores of participant-rated therapeutic alliance were associated with a lower rate of repeat suicide attempts in the ASSIP group.

Some promising results also emerged from a randomised control trial undertaken by the Australian Institute for Suicide Research and Prevention (AISRAP)⁴¹ in 2006-2007 to evaluate the provision of an Intensive Case Management (ICM) follow-up of high-risk people for one year. This study involved 60 males who had presented at a city hospital following suicide attempts and were diagnosed with psychiatric illness. The ICM intervention featured weekly face-to-face contact with a community case manager (psychologist, psychiatric nurse or social worker) for 12 months. ICM condition participants had significant improvements in depression scores, suicide ideation and quality of life. ICM participants reported more contacts with mental and allied health services, had better relationships with therapists, and were more satisfied with the services that they did receive. There were no suicides in the ICM group.

Brief intervention delivered by buddy vs. research assistant

The Buddy intervention support program tested the same brief intervention delivered by a participant-nominated 'buddy' (trained support person) compared to delivery by a trained researcher.⁴² The brief intervention was taken from the SUPRE-MISS study⁴⁰ delivered over a period of 18 months. Buddies, who were nominated by the participant (for instance, a friend or family member), attended three four-hour workshops covering information sharing, feedback, management of challenges, coping skills, counselling strategies and information on how to facilitate further care or support. The 'buddy' engaged in regular follow-up (as per assessment timepoints) and asked the same questions as researchers (covering the person's perceived wellbeing, further suicidal attempts and need for medical or specialist assistance) and provided additional support as required. These follow-ups were conducted face-to-face where possible and by phone if unable to meet face-to-face. Contacts occurred at weeks 1, 2, 4, 7 and 11, and at months 4, 6, 12 and eighteen. For both groups, the intervention was based on the *Ask Care Escort* (ACE) intervention used by the US Army.

At the 18-month follow-up, the buddy intervention group had significantly fewer participants who had attempted suicide (1.9% vs. 3.2%). The incident ratio 0.66 ($p = 0.027$) was also favourably significant towards the Buddy intervention.

Combining telephone calls and letters

An intervention that combined phone calls and letters was no more effective in reducing suicide reattempts at 12 months than a series of letters sent after randomisation and at 1, 6 and 11 months.⁴³ Telephone calls were made at two weeks, one month and three months to briefly assess psychopathological state and risk of suicide and to evaluate mental health treatment adherence. There was also a psychiatrist available to assist with treatment coordination. The authors suggest that contacting patients rapidly after the index episode might not be sufficient and that a high frequency of contacts during the critical first weeks is of paramount importance.

Combining several brief strategies

In two New Zealand studies, one with the general population²⁴ and one with Maori people²³, no effect on suicide reattempt rates was found at 12-month follow-up when participants were offered the following in addition to usual care:

1. Patient support for up to two weeks

2. Eight postcards over one year
3. Access to problem-solving therapy
4. Improved access to primary care
5. A risk management strategy
6. Cultural assessment.

First contact did not occur until two weeks after hospital discharge. The intervention for Maori people was delivered by Maori clinicians. In Maori patients who presented to hospital with intentional self-harm a culturally informed intervention had an effect on hopelessness and re-presentation with self harm in the short term but not at 12 months. There was a significant decrease in hospital presentations for non-self harm over the next year.

In the mainstream study, there were no significant differences in the primary outcome or in most of the secondary outcomes between the two groups. About half the people who were offered problem-solving therapy did not receive it, for various reasons. There were no significant differences between the groups on any of the continuous outcome measures (hopelessness, anxiety, depression, quality of life) at three- or 12-month follow-up except for sense of belonging at three months and the multigroup ethnic identity measure at one year. The study design was such that 737 were randomized to receive the intervention but only 327 people consented to receive the intervention and 357 out of 737 consented to receive treatment as usual and be followed up. The intention-to-treat analyses included those who did not consent, and this may have diluted the effect of the intervention.

Assertive aftercare and case management

Four assertive aftercare studies were reviewed.^{29, 44-47} Assertive care is where the case manager/care provider is responsible for maintaining contact with the client as a way of supporting the client to stay in care. Two were published within the defined period (2013 onwards) and two additional studies were included as seminal studies. Of the four studies, two found a reduction in repeat suicide attempts compared with a control condition. One study that did not find an effect was a superiority trial where treatment as usual was the Collaborative Assessment and Management of Suicidality model (CAMS)⁴⁴. The first trial of intensive case management in Australia was not sufficiently powered to detect a difference in repeat suicide attempts between the intervention and control group, with 10 participants attempting suicide in the 12-month follow-up, and so is reported under the heading '*Models that have demonstrated other outcomes*'.¹⁹

Outreach, Problem-Solving, Adherence, and Continuity (OPAC) model

The OPAC model provides six months of care delivered by a nurse^{45, 48}:

1. Outreach: active, rapid response, initiating and maintaining individually tailored contact
2. Problem-solving: solution focussed counselling
3. Adherence: act as motivator and supporter for adherence to psychiatric therapy and other forms of treatment
4. Continuity: contact with the same nurse throughout the program.

The OPAC model contains components of aftercare that have subsequently been adopted by other effective models, namely rapid and frequent follow-up, support to remain in treatment and continuity of care. During the trial, participants received about eight home visits plus contact by telephone, phone messages, emails and letters. The OPAC intervention resulted in a reduction in the number of patients who reattempted, which remained significant up to just over three years post-intervention, but this difference was no longer significant at the five-year follow-up. The authors argue for rapid and assertive follow-up and conclude that making and keeping contact seems to be a key factor in preventing suicide.

Assertive case management in Japan (ACTION-J)

The ACTION-J model used assertive and continuous case management provided by the case managers who worked on-site at the participating hospitals.^{46, 47} Case management included assessment, planning, encouragement and coordination. Each participant underwent an assessment of treatment status and adherence, suicidal ideation, relationship with family and other caregivers, social problems that could affect mental and treatment status, and use of various social resources. Based on the results, case managers encouraged participants to adhere to psychiatric treatment and other medical or social care, and if necessary, coordinated for use of these resources to meet individual needs. Contacts occurred at week one, and 1, 2, 3, 6, 12 and 18 months. When the case managers could not contact participants, they approached family members who had also provided informed consent. Family members were provided with psychoeducation at the hospital. Participants were also able to contact the case manager by telephone or face-to-face. There was a significant reduction in the number of participants who reattempted at six months but not at 18 months. Post hoc analysis found it more effective for women at 18 months than for women in the control condition.

Analysis of the numbers of self-harm episodes suggested that the effectiveness of assertive case management of repeat self-harm was especially accounted for by reducing the number of patients who subsequently had multiple repetitions (three or more episodes). Subgroup analyses showed a greater reduction in the number of overall self-harm episodes by 27% among patients with no previous suicide attempt at baseline.

Assertive case management and outreach

An assertive intervention for deliberate self harm (AID)⁴⁴ was used in a superiority trial with Collaborative Assessment and Management of Suicidality (CAMS) as the control condition. The intervention included case management, assertive outreach, crisis intervention, flexible problem solving, motivational support and actively assisting patients to attend appointments. Care was provided through home visits or meetings in cafes, as well as meetings with healthcare, official and social services to accommodate individual needs. Eight to 20 flexible outreach consultations were provided over six months. Based on hospital records, there was no difference in the number of patients who reattempted during 12-month follow-up period. However, based on self-reported self-harm, fewer patients in the AID condition repeated self-harm (12%) compared with the control condition (19%) during the 12-month study period.

Models that have demonstrated other outcomes

In the trial of the ASSIP model (three therapy sessions plus tailored letters for 24 months), the ASSIP group had 72% fewer days of inpatient care and 63% fewer days of hospitalisation (non-significant difference). Within the ASSIP group, stronger patient-rated therapeutic alliance was associated with reduced suicide risk. There was no difference between the groups on a measure of depression, although a significant reduction over time was noted in both groups. There was no significant difference between groups for suicide ideation. There was a significant difference in drop-out rate at the 24-month follow-up (7% ASSIP, 22% control). A health economic analysis of the ASSIP model showed a 96% chance of being less costly and more effective than treatment as usual. Intervention costs were higher in the ASSIP group (approximately three-fold), however, overall hospital costs were significantly lower than for the control group. Hospitalisation and total hospital costs were lower in the ASSIP group than in the control group (approximately half the cost), but this difference was not significant.⁴⁹

The remainder of the services described below were identified through grey literature sources.

Lifeline Suicide Crisis Support Program (LSCSP)

This program was developed by drawing on telephone follow-up services that had been operating in Lifeline Centres in Australia on a local basis, with input from the models of 'buddy' support provision that

involved non-clinical personal support being offered to a suicidal person on a routine basis for a short period. The LSCSP trial operated across five locations from 2006 to 2007 with an evaluation being prepared in 2008 by University of Canberra researchers.¹⁸

The LSCSP service established a support contact and relationship for a defined period (generally eight weeks) and in-depth telephone conversations similar to those occurring on a crisis helpline, but with the same person. Participants in the LSCSP were generally noted to have high levels of suicidal ideation, clear suicide plans and experiencing life events that created crisis experiences for them. Most had significant mental health problems and many had problematic alcohol use. The LSCSP aimed to help suicidal persons to 'stay safe', that is, to avoid reattempting suicide, to build the person's resilience and coping skills, and to establish linkages for suicidal persons with professional, personal and community supports.

Data from 74 of a possible 92 participants was collected and presented publicly at the American Association of Suicidology Conference in 2008. The results were published in a comprehensive report¹⁸:

- Using a five point scale, participant self-reported coping at the end of the program was significantly improved to coping okay (M=2.29, SD=1.17), $t(40)=5.396$, $p<.001$, with 30% of clients coping well
- Also on a five point scale, participant self-reported perception of suicidal pain (psychache) was significantly reduced at the end of the program, $t(24)=4.129$, $p<.001$, and the average level of pain was just over the second point of the scale (M=2.36, SD=1.79); slightly less than one quarter of the clients still experienced nearly unbearable or unbearable pain
- Self-reported knowledge and use of resources increased for participants, with a quarter of participants feeling well resourced and three-quarters feeling well resourced or fairly well resourced at the end of the program.

A limitation of this study was the relatively small number of participants and data reliability in collection and administration across the different trial sites; moreover, the data collection from participants was undertaken by the local program coordinator delivering the service. The evaluation did not obtain data on suicide (re)attempts or deaths by participants.

However, this trial was ground-breaking at the time in pointing to the value of non-clinical supports for suicidal persons in feeling supported and encouraged to access resources to address issues in their lives, and in demonstrating that these could be delivered through telephone contact on an outward-call basis.

The Way Back Support Service (TWBSS) Northern Territory

During the pilot study (2014/15)⁵⁰ the service received 122 referrals and provided care and support to 87 clients. A limited evaluation of service feasibility and the extent to which it met clients' needs was conducted, concluding that the service was both appropriate and feasible. These findings have been borne out by the subsequent rollout of TWBSS across Australia and evaluations since. The report's first recommendation, that *"A proactive approach is required to establish strong working relationships between the health and mental health hospital emergency department staff and the Support Service staff"*, has also been borne out, as a key focus for all of the aftercare services with whom we spoke during this process, and critical to service uptake.

Using the WHO-5 measure of wellbeing, the evaluation found that clients' wellbeing improved from a mean score of 12.5 at baseline to 22.5 at the end of their three-month service use. Qualitative interviews noted that some face-to-face contact was important to service users, and that the non-judgemental, advocating and collaborative approach taken by staff was valued.

Intensive Case Management (ICM) intervention, Australia

This was a randomised controlled trial of intensive case management, comprising face-to-face sessions with a case manager each week and two calls from a LifeLine counsellor per week for a 12 month period, for patients discharged from psychiatric care who were considered to be at risk of suicide (N=116).¹⁹ There were differences in attrition rates of participants in treatment as usual compared to the ICM group (38.6% versus

8.5% respectively in the first week of treatment). Additionally, during the study period, there was a significantly greater number of treatment as usual participants hospitalised at six-month assessment compared to ICM. There was a greater symptom reduction over the 12-month period amongst the ICM group compared to treatment as usual on measures of depression, suicidal ideation and hopelessness. The only factor significantly differentiating outcomes for treatment as usual and ICM at six months was confidence and solidarity in the case-manager/client relationship.

Case management involved face-to-face meetings with the aim of providing a structured and holistic model of post-discharge care, focused on addressing individual patients' needs and goals. An assertive outreach service was provided in a variety of settings, including home visits. Linkage and brokerage services assisted clients who needed specialised services beyond the capabilities of the service/case manager. There was also provision for individual and group psychotherapy and counselling services.

The findings reported in this study indicate that there may be limited clinical gain in recommending ICM treatment beyond five or six months from intake, since no significant impact of treatment could be observed beyond that time.

Next Steps, Illawarra/Shoalhaven

The service is funded by NSW Health and the Primary Health Network (PHN) and is managed by Grand Pacific Health.⁵¹ The referral pathways into the service are via local health district services (clinical nurse consultant or Registrar at ED, Community Mental Health, Mental Health Line [those assessed by Acute Care]) and Aboriginal partner organisations. In a preliminary evaluation, the percentage of clients scoring in the *normal to mild range* on the DASS subscales ranged from 2% to 17% at baseline, rising to 57% to 64% at discharge. There were improvements in hopelessness and burdensomeness across the 12 weeks, but no change on a measure of thwarted belongingness. Self-rated suicide risk and wish to die decreased and wish to live increased.

The model includes peer and clinical support for up to 12 weeks, with some scope for support beyond that period. Clinicians use some of the worksheets from the Collaborative Assessment and Management of Suicidality (CAMS) model. The program begins with a planning meeting with a mental health and peer worker where goals are set collaboratively with the consumer and their carer(s). The peer worker then facilitates the consumer to achieve these goals and set new ones as necessary. There are reviews with a mental health and peer worker at four weeks and at discharge (maximum length 12 weeks, although up to two safety net sessions are available in the 12 months after discharge).

The service can work alongside the Acute Care Team where they are still providing follow-up phone calls, or in parallel with Community Mental Health clinicians, providing peer work reintegration support while they provide mental health therapy. It can also work in parallel with other Grand Pacific Health provided services such as Suicide Prevention Risk De-escalation therapy and Integrated Recovery Services.

If the person is not ready to engage but they give permission, their carer or support person can take the appointment as a one-off intervention. All carers or support people can attend a psychoeducation training session on caring for people with suicidality and some basic communication skills. The clinician is there for a large proportion of the time to answer any questions the support person might have. There has been low uptake of these services as many Next Steps participants cannot identify a support person.

A comprehensive trial is planned, comparing participants to 1200 community sample controls using data from NSW Health databases. The main outcome variable will be re-presentations at ED. The trial is due to be completed at the end of 2020.

The Way Back Support Service, Australian Capital Territory

The evaluation used (1) client scores on pre-post K10 scale, and (2) qualitative interviews with clients and staff.⁵⁹ On the K10, anxiety scores showed a 5.7 point reduction, with depression scores 6.6 lower and an 11.2 reduction overall. A drop of five points or more is significant and indicates that the intervention has had a positive impact on reducing anxiety and depression.

The skills and qualities of the Support Coordinators and the activities they conduct with participants has been highlighted as a fundamental element of the success of TWBSS. The ability to design a flexible, person-centred response that caters for diversity of need and level of intensity is fundamental to the success of the service model.

Eight people made a second suicide attempt after initially engaging with the service. All but one person reengaged with the Service following the second attempt. Six of these attempts occurred within the first two weeks of discharge and where there had only been an initial meeting with the Service.

Models that have been tailored for priority populations

The evidence for models amongst priority populations is very limited. We identified one study with Indigenous people, one with serving military and one with young people, all described below. No studies were found that examined tailored models of care for LGBTQI+ people, Aboriginal and Torres Strait Islander people or older people.

Indigenous people

Only the Hatcher model²³ was specifically tested with an Indigenous population (New Zealand, Maori people); it was not found to have a sustained effect on repeat episodes of suicide attempt. Patients in the intervention group were less likely to have a repeat suicide attempt at three months but not at 12 months and were less likely to be hospitalised for other causes.

Military

A caring contacts intervention was trialled with serving military personnel who had presented with suicidal ideation or suicide attempt. The intervention was delivered in addition to treatment as usual and was compared with treatment as usual alone. The caring contacts were brief periodic undemanding text messages expressing unconditional care and concern, delivered over a 12-month period. Replies were monitored 24 hours a day and responded to if necessary, with (a) a short text where no distress was indicated, or (b) a phone call where the person may have been at risk. Treatment as usual was individual therapy and psychiatric medication followed by group therapy and substance abuse treatment. The intervention group reported fewer suicide attempts (odds ratio 0.52; [95% CI, 0.29 - 0.92]; $p = 0.03$) and reduced odds for any suicidal ideation between baseline and final follow-up at 12 months (odds ratio 0.56; [95% CI, 0.33-0.95]; $p=0.03$). There was no significant effect on ED visits, or on the likelihood or severity of current suicidal ideation.

Young people

Only one study focused specifically on young people³⁸, finding that multiple telephone calls to the young person (12-18 years) who had been hospitalised for suicidal ideation or attempt, and their guardians, resulted in fewer incidents of suicidal behaviour compared with a single call at 90 days. Both groups received calls in addition to treatment as usual. Calls were for 10-20 minutes at 1, 7, 14, 30, 60 and 90 days post discharge. Authors stressed the need for early and repeated contact attempts for young people.

Models that include peer support

There were no trials that rigorously evaluated the impact of peer support in suicide aftercare. The 'buddy' intervention support trial⁴² found that intervention delivered by a 'buddy' was more effective than the same intervention delivered by a researcher. Another suicide prevention support program delivered by peer

support specialists demonstrated the feasibility and acceptability of a peer support intervention but did not compare the intervention group with the control group on suicide attempt outcomes.⁵² The Next Steps program combines clinical and peer work support.⁵¹ On the final survey completed by consumers, 94% identified peer work involvement as the 'most helpful' aspect of the program. There is research on the impact of peer support within mental health programs, but this research was out of scope for this review.

Question 2: From the services identified in Question 1, what components of the services have been determined to contribute to services' effectiveness?

While there was no research identified that focused on components of effectiveness, the effective models did have some components in common, namely: rapid follow-up with greater intensity in the early weeks, a strong focus on continuity of care, engagement, and therapeutic alliance, having first contact face-to-face where possible, assertive follow-up (i.e. case manager is responsible for maintaining contact), addressing a broad range of psychosocial goals, involvement of a support person where possible, engaging people at the first attempt and integration with clinical care. These components are summarised in Appendix D and described in more detail below.

Rapid follow-up with greater intensity in the early weeks

Of the five studies that showed no reduction in repeat suicide attempts, the interventions provided to patients had a longer period to first contact following hospital discharge. This compares with 6 of 10 studies showing a risk reduction where first contact largely occurred within 24 hours of discharge from hospital. This is supported by epidemiological^{53, 54} and qualitative research⁵⁵ which indicates that the first days following discharge are often a distressing and high-risk period for people who have attempted suicide.

Several study authors also argue for rapid and frequent follow-up in the early weeks.^{34, 39, 43, 48} More frequent contact in the first weeks after discharge may be associated with effectiveness, with five of the 10 models showing effectiveness reporting at least weekly follow-up in the first few weeks, and only one of the ineffective models doing so.

Duration of follow-up

There was no clear relationship between effectiveness and duration of the program. Nevertheless, several authors concluded that while three months is enough for most clients, having the option of longer-term follow-up for *some* clients would be of value. Consistent with this, the Australian Capital Territory (ACT) evaluation commented on the suicide death of three people who had completed TWBSS program. The authors concluded that longer term assistance could have made a difference for two of these clients, given the difficulties they experienced in finding other services to which they could transition, and evidence of the time taken to establish a trusting relationship with one of the clients.

A focus on therapeutic alliance, continuity of care, and engagement

Two consistent findings in mental health and suicide prevention research are that: (1) patients who remain engaged with treatment and services have better outcomes, and (2) a strong patient-rated therapeutic alliance between patient and provider is associated with better patient outcomes. This finding is true for this field also; where therapeutic alliance has been measured, it has predicted reduced repetition of suicide attempts.⁵⁶ Stronger engagement can be achieved in aftercare by early contact at a location that suits the client, a respectful and non-judgemental stance from the clinician or coordinator, a client-centred, collaborative approach to goal setting and planning, and a flexible approach to delivering support. The following elements were identified as contributing to engagement in TWBSS ACT evaluation:

- A flexible service model
- The qualities of the staff (i.e. caring and non-judgemental)
- The attitude of respect and clarity that was brought to the work
- Meeting people at a place and time that was comfortable for them

- Meeting people prior to discharge and knowing that this person would be supporting them when they left hospital
- Having conversations about the suicide attempt that acknowledged the impact but also focused on how to keep safe in the future
- Having a focus that was holistic and focused on actions and that assisted people to experience greater integration across their lives
- Having a creative and innovative approach to safety planning, having conversations, life planning and increasing motivation.

One Australian service provided data on the proportion of clients who engage according to where the first visit occurs, with 70% engaging if the first visit is in the hospital and 91% if the first visit is in the home.⁵⁷ This is against a background engagement rate of 52 per cent. In a further indication that there are gender differences in service engagement and therefore outcomes, women were more likely to engage than men (57% vs. 52%).

In keeping with the importance of the therapeutic relationship, several studies have identified that the following points are high-risk times for suicide: when key personnel are on leave or leaving, and times when clients are not in contact with services in the period following discharge from hospital.^{53, 54, 58}

Amongst the peer-reviewed studies, having the same person in contact with the client throughout the program appeared to be associated with effectiveness, with eight of the 10 effective studies appearing to incorporate this into their care model. There is limited evidence that once a strong alliance is established and the client is stabilised, low-intensity follow-up, for example by letter, may help to maintain good outcomes for the client.⁵⁶

Face-to-face first

Although brief contact interventions have demonstrated a reduction in the incident rate of repeat self-harm (that is, the total number of repeat events across the study population)²⁵, they have yet to demonstrate a reduction in individual risk of a repeat self-harm episode or suicide attempt. Interventions where there is some face-to-face contact before moving to postcards, letters or texts appear to reduce individual risk. In the ACT evaluation, it was identified that overall, people prefer face-to-face contact (71%) and then phone and SMS contact as the secondary way of contact.⁵⁹

Assertiveness of follow-up

Three of the 10 models showing an effect on repeat suicide attempts used a range of follow-up strategies (letters, texts, telephone calls) to remain in touch with clients. The need for a focus on assertive follow-up is reinforced by several studies which showed that clients who remained in treatment achieved better outcomes.

Case management and addressing a broad range of psychosocial needs

In the Next Steps service, the most common goals set by clients were vocational and mental health, followed by relationships and physical health goals.⁵¹ Ninety-six per cent of clients partly or fully achieved at least one short-term goal from their aftercare plan, and 86% partly or fully achieved at least one long-term goal within the 12-week program. In TWBSS ACT, the top four needs and areas of concern were mental health, employment/study, social and relationships, and finances. Although only three of the 10 effective models used case management (the others were brief interventions or brief contact interventions), there is a clear need for a broad range of needs to be addressed within aftercare services.

Involvement of support person (family, carer)

Few studies included a support person in the care protocol, but where they did, the model was effective. In practice, data from Australian services indicates that this is difficult to achieve, primarily because service

users are unable or unwilling to identify a support person. Although we need to respect service users' judgement about the wisdom of involving a support person in the care process, there is nevertheless a need to work with service users to fully explore this as an option.

Engaging people at the first attempt

Some studies identified that interventions were more effective for patients where it was their first suicide attempt.^{39, 47} This has implications for the point of referral (usually the ED) and reinforces the need for efforts underway in Australian services to strengthen the referral pathway between the initial point of contact and the aftercare service.

Integration with clinical care

Studies that have found no effect of follow-up after a suicide attempt were generally evaluations of strategies where the follow-up was not coordinated with treatment.¹¹⁻¹³ This suggests that models that integrate clinical and non-clinical care may have the greatest benefit for clients.

Gaps in the evidence

There were no rigorous evaluations of the impact of Australian services on suicidal behaviour available. Several evaluations are underway, and some will be available within two to four months of the completion of this report. We identified two that will examine impact on suicidal behaviour (the Newcastle TWBSS, available September 2019, and Next Steps in the Illawarra Shoalhaven, yet to be commenced). The evaluation status of several Australian services is described in Appendix C.

There were very few studies with priority populations (young people, LGBTQI+, Aboriginal and Torres Strait Islander people). Only one study with young people examined their suicide attempt outcomes.³⁸ Another study included a small number of patients who were under 18 years of age but there was no separate analysis of their outcomes.³⁰ An earlier quasi-experimental study (1992-1994) of an emergency room intervention with adolescents found that follow-up treatment increased treatment adherence, and reduced suicidal ideation at one month follow-up but not over the three year study period. However, the study has been excluded because (1) it was delivered in the emergency room only, and (2) it is outside of the review period of 2013 onwards.⁶⁰

There is little rigorous research examining components of effective care, including the impact of having peer support in dedicated aftercare models. At least two studies used post hoc analysis to examine differences in outcomes for men and women and found that the intervention was less effective for men. Data from one Australian service also indicated that men are less likely to engage with aftercare services. More work is needed to identify effective services and engagement strategies for men, and to tease out whether it is lower engagement that leads to poorer outcomes for men.

With the growing inclusion of peer support in suicide prevention programs, it is worth noting a lack of rigorous research examining the benefits of peer support in suicide aftercare. There was only one trial that examined patient outcomes when peer supporters provided the intervention, and this was an unusual model where the participant nominated a support person who was then trained.⁴² Nevertheless, the trial demonstrated that the same intervention delivered by a support person was more effective than when delivered by a trained researcher. Anecdotal feedback from service users in Australia provides support for the inclusion of peer workers, and indeed for further research to examine the impact of peer support.

Only one study examined the cost-effectiveness of suicide aftercare, the ASSIP model.⁵⁶ This model is quite different to those being implemented in Australia and so the findings from it may not be generalisable to the Australian context.

Future research and service development should examine more closely if outcomes and experiences from the services are similar or different across different user groups – and draw on studies of other services on

this demographic basis – to explore more closely the service delivery practices and characteristics that will work best with engagement and utilisation of services by particular audiences.

Finally, there is little evidence regarding other outcomes for clients of suicide aftercare services. In Australia, this may be addressed by two pieces of work. The first is the development of a tool by Professor Phillip Batterham at the Australian National University, for Beyond Blue, to monitor suicidality, mental wellbeing and recovery from a suicide attempt. The tool is designed to enable an evaluation of the service's effectiveness in supporting clients during the first three months following a suicide attempt. The second is the proposed evaluation of the national rollout of TWBSS. Although we have not yet seen the request for proposal, it may provide an opportunity to explore not only the impact of the program on suicide reattempts, but on broader psychosocial outcomes.

Discussion

Implications of research evidence for provision of suicide aftercare services

The research establishes consistently that dedicated crisis response and aftercare services and support following a suicide attempt are effective in reducing subsequent suicide attempts. This appears to apply regardless of the nature or model of the service response with the key variables being the timeliness of the service offered and the character and quality of the service, that is, the extent to which genuine and human connection is established with a suicidal person (and their carers) to enable progression on other service dimensions. This finding is consistent with the limited research knowledge on service preferences from people with lived experience of suicide attempts, although this research clearly reinforces the importance of preventing negative experiences with hospital and health services, and the benefit of engagement with personnel who can demonstrate non-judgemental, compassionate and helpful attitudes towards a person who has survived a suicidal crisis and possibly attempted to end their life. This and other principles underpinning the models emerge from the research, and include: rapid and assertive follow-up post-discharge, a focus on therapeutic alliance, continuity of care, frequent contact early in care, face to face contact in the first instance, involvement of a support person, and integration of clinical and non-clinical support.

These principles are inferred from examining the common components of models that have been shown to reduce suicide attempt risk in randomised controlled trials. With one exception, there has been no examination of mediating factors. This factor, client-rated therapeutic alliance, consistently emerges as predictive of better outcomes across a range of therapeutic models and disorders. It is likely related to ongoing client engagement and retention in treatment, which is in turn related to better outcomes for the client. Although it has implications for defining what type of services should be offered, it has further implications for how services are managed, the type of culture that is established and supported within the service organisation, and for how frontline staff are supported in their difficult work.

There is a clear case for investment within hospital and health systems – and for the related investment in social services and related community supports – to enable the operation of effective suicide aftercare services. Both on the assessed need (risk of suicide and suicide reattempts) and on creating pathways for engagement in longer term treatments, the research evidence suggests benefits in such investments, and conversely challenges alternative choices not to invest in these service responses.

There are benefits to be realised from investments in suicide aftercare services in two ways:

1. For the suicidal person and their carers, opportunities for recovery and longer-term improvement are created through interruption of a cycle of crisis and further suicide attempts – at least in the short to medium term
2. For the health and hospital system, there is reduced utilisation of emergency responses to suicide attempt situations and the potential to redirect resources towards recovery and support related services.

We found only one economic analysis of aftercare, which was for the ASSIP intervention. This study found that compared with treatment as usual, ASSIP resulted in fewer reattempts at lower overall cost⁴⁹ and was therefore cost-effective.

A conundrum does arise, however, from the research reviewed – that the association between suicide aftercare services and reduced suicide attempts, overall, or reduced suicide deaths in a prescribed population, is hard to reliably determine. While there are some encouraging results and some large studies

such as that undertaken through the WHO by Fleishmann et al.⁴⁰ that suggest that associations exist between aftercare and reductions in suicide attempts, there are other studies that question the strength of this association and at times have generated null results.

So, while the need for and the case for investment in suicide aftercare services may be clear there are nuances in how the results across studies may be interpreted. It is important to note that the positive research findings point to a behavioural outcome rather than a clinical outcome on suicidality – an outcome which is positive in showing that the destructive behaviours may be moderated or reduced, but with limitations because of the complex nature of suicide; no single service or program is going to prevent suicides in itself and therefore aftercare needs to be considered within an array of integrated strategies. Likewise, where the research findings have not been positive, it may be difficult to fully attribute this to failures of the suicide aftercare services being examined, as the context in which these services are being delivered may have stronger factors to influence individual suicidal behaviours.

A further complication of the research evidence on suicide aftercare services when it is related to randomised studies is that there are few studies that attempt to set outcomes measures other than high-level behavioural outcomes of reduced suicide (re)attempts or suicide deaths. Accordingly, the benefits to participants, their carers and the community are not as easily found or often reported. When they are measured, there is not yet a consistent measure or set of outcomes against which research studies are conducted.

The application of measures of suicidality would seem appropriate to test aftercare and follow-up services to assess whether or not participants are benefiting by having reductions in their suicidality; there are also measures of self-awareness and capacity to address suicidality that could be examined further to identify those services and approaches that create a lasting impact for the suicidal person and a more fundamental shift in the level of their suicidality.

Another complication in interpreting the research review results is that only a few studies distinguish between people who have experienced a single suicide attempt from those who have experienced multiple suicide attempts. However, the identification of chronic or continuing suicidality may have a major bearing on the service response needed and the potential for reduction or prevention of suicide attempts. This distinction regarding forms of suicidality and behaviours should be regarded as a fundamental point of examination in the design of service responses because of the affect that a person's multiple past attempts of suicide may have on their fear of death (acquired capability), their knowledge of means, their experiences of hospital and health services, the depth of their suicidality and the nature of psychiatric treatments required. Little distinction is drawn in the research reviewed on this critical characteristic of the participants in services; where mention is made it tends to highlight a dulling effect or different results for those participants who have experienced multiple suicide attempts – and most likely a chronic suicidality.

Finally, the research evidence examined almost completely fails to draw data from participants in services and programs; the lived experience perspective is not collected or utilised. Sometimes the views of clinicians and service providers are obtained, and there is some observation of behavioural responses by third parties. Overall, there is very little evidence in the studies reviewed surrounding how follow-up and aftercare services are experienced by service users and their carers – and therefore little evidence about what will work well and if there are particular service practices to promote or discontinue. For instance, the OPAC model appears effective but it is unknown whether the assertive outreach, the problem-solving counselling, the motivation for adherence to treatment or the continuity of contact throughout the program were most beneficial to the participants. Moreover, it is unknown what service delivery practices are required across these functions in the OPAC model to succeed in engaging with participants and achieve positive outcomes. This knowledge can only be properly obtained by research methods that collect data from participants.

From a policy and service planning perspective, then, this review of research evidence provides encouragement for the investment and propagation of suicide aftercare services within a hospital and health system. It provides some indications of the different service types and the comparative effectiveness of some over others, including the identification of various factors that seem to improve effectiveness.

Conclusion

The importance of effective follow-up contact and support for persons who have experienced a suicide attempt is reinforced from all sources examined, including research literature and systematic reviews, policy reports and the perspectives of those who have lived experience of a suicide attempt. There are encouraging results from research on the benefits of planned, systematic follow-up contact, especially in the period surrounding discharge from acute care and the return to community.

Some of the factors identified as contributing to effective service models are connected: engagement, therapeutic alliance, continuity of care, face-to-face care, rapid follow-up and the qualities of the staff. In qualitative research, some of the other features identified as contributing to effectiveness were flexibility in the service model, meeting people prior to discharge or in their home environment, and having a focus on actions that assist people to have greater integration across their lives.

Brief contact appears to be an effective technique for demonstrating to the suicidal person that there are supports available and for reinforcing the offer of social connectedness that may have been lost or severely diminished at the time of the suicidal crisis, and which may be most effective once a therapeutic relationship is established between the client and clinicians.

Brief interventions that are integrated with clinical services or that provide therapy also show promise. Integration of non-clinical services and general support services with improved coordination of clinical care and treatment programs appears to be the more effective model of service in terms of benefits to an individual's quality of life and motivation, but also in achieving observable changes in suicidal behaviour.

At the heart of all responses the need for empathic and respectful interactions with the person who has attempted suicide and their families/carers is essential as a measure of service quality. Careful and person-centred processes must therefore be adopted.

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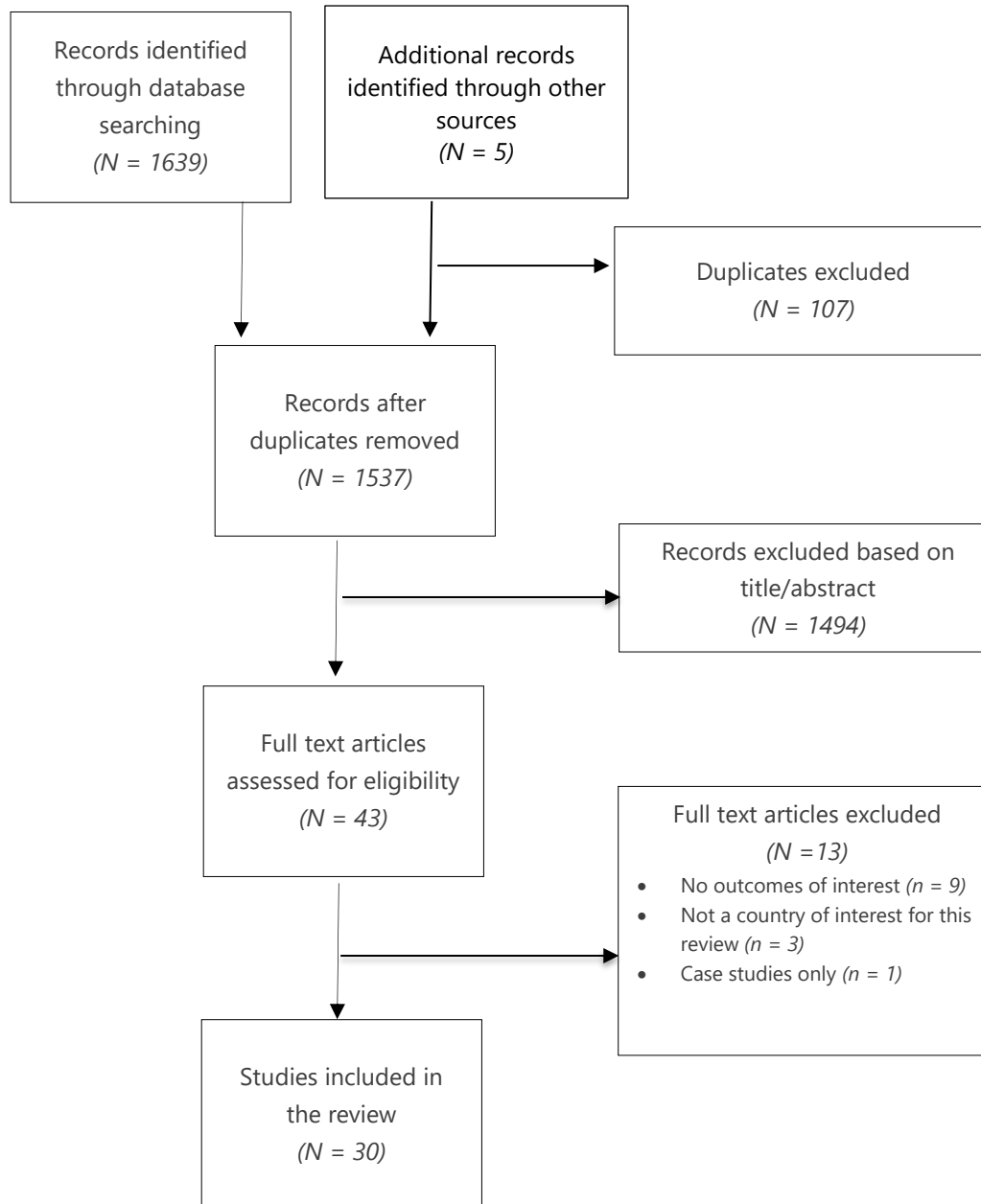
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Appendices

Appendix A: Flowchart of the results of the literature search



Appendix B: Details of included studies

Author, year	Study type	Level of evidence	Population	Sample size (N)	Intervention	Control	Outcomes	Direction of effect	Comments
Intervention type: Brief intervention									
Miller et al., 2017	Quasi-experimental	III	Adults with suicidal ideation or recent attempt	1,376	Telephone contact - identifying risk factors, clarifying values and goals, safety and future planning, facilitating treatment engagement/adherence, and facilitating significant other problem solving	Historical control group + other regions, analysed for risk characteristics	Repeat suicide attempt	Decrease in intervention period compared to control (18 vs. 23% of participants had repeat SA)	
Rengasamy & Sparks, 2019	RCT	II	Adolescents (12-18 yrs) admitted to hospital for SA	142	Multiple telephone calls 1,7,14,30,60,90 days post discharge. Separate calls made to guardian	Single telephone call 90 days post-discharge	Repeat suicide attempt	Decrease in suicidal behaviour in MCI group (6% vs. 17%)	
Gysin-Maillart et al., 2016; Michel et al., 2017; Park et al., 2018	RCT	II	Adult patients admitted to ED following suicide attempt	120	ASSIP: Three therapy sessions using narrative interviewing followed by tailored letters for 24 months	treatment as usual	Repeat suicide attempt	Decrease in suicidal behaviour in intervention group (8% vs. 27%)	Low-intensity support after relationship is established may be effective

Author, year	Study type	Level of evidence	Population	Sample size (N)	Intervention	Control	Outcomes	Direction of effect	Comments
Exbrayat et al., 2017	Single centre case control ITT	III	18+ years, suicide attempt, no hx of psychiatric hospitalisation. Included outpatients and those with <3 day hospital stays.	823	3 x follow-up phone calls; where nurse would complete 3 item scale covering suicide risk, emergency & degree of harmfulness & medication compliance; + letters if they did not get to speak to them	treatment as usual	Repeat suicide attempt	Decrease in repeat attempts in intervention group (13%) compared to control group (18%)	
Cebria et al., 2013; Cebria et al., 2015 (five year follow-up)	Multi-centre (2 EDs) non randomised case control study	III	No age limit; suicide attempt; presented to ED	991	1. Post discharge visit by psychiatrist within 10 days of discharge. 2. Phone calls to assess risk of suicide & increase adherence to treatment 3. Promoted follow-up of treatment plan, provided additional referrals as necessary, + provided crisis intervention as necessary	treatment as usual	Repeat suicide attempt	Reattempt more delayed in intervention group (mean days 346.47), compared to control (mean days 316.46). Decrease in repeat SA in intervention group compared to control group (6% vs. 14%)	Effect of intervention not sustained at 5 year follow-up timepoint (Cebria 2015)

Author, year	Study type	Level of evidence	Population	Sample size (N)	Intervention	Control	Outcomes	Direction of effect	Comments
Fleischmann et al., 2008 ²	RCT	II	Patients who had a suicide attempt seen at the ED	1,867	Brief Intervention and Contact (BIC) (phone calls or visits)	treatment as usual	Death from suicide at 18 month follow-up	Significantly more deaths from suicide in the treatment as usual group than the BIC group ($\chi^2 = 13.83$; $P < 0.001$)	Study was conducted across low to middle income countries
Mouaffak et al., 2015	RCT - prospective	II	Adults surviving a suicide attempt, discharged from the ED and referred to an outpatient follow-up program after a stay of less than 72h, giving consent, able to be contacted by phone (not	320	Same as control group i.e. letter & resource a few days after randomisation Reminder letter 1st, 6th & 11th month Plus p/calls 2 wks post d/c, & mths 1 & 3 w brief Ax of psychopathological state & risk of suicide & evaluation of MH treatment adherence	Letter & resource a few days after randomisation reminder letters 1st, 6th & 11th mth included medical care, evaluation of suicide risk and formulation of an initial treatment plan	Repeat suicide attempt	No effect - Proportion of suicide reattempt: control 23 (14.5%), intervention 22 (14%) Proportion of suicide reattempt in first timers: control 8 (5.2%) intervention 8 (5.3%) Proportion of suicide reattempt in	

Author, year	Study type	Level of evidence	Population	Sample size (N)	Intervention	Control	Outcomes	Direction of effect	Comments
			incarcerated or homeless) and able to communicate in French without an interpreter			by a psychiatrist		repeaters: control 37 (23.3%) intervention 37 (23.4%)	
Messiah et al., 2019; Vaiva et al., 2018	RCT	II	France	1,040	ALGOS – crisis cards, brief telephone calls	treatment as usual	Reattempt	<p>Vaiva: decrease in reattempts in intervention group (12.8%) vs. 17.2% in control group</p> <p>Messiah: at 6mth & 13mths 1st attempt intervention group less likely to reattempt than control group</p>	
Hatcher et al., 2015; Hatcher et al., 2016	Zelen RCT	II	New Zealand	2015= 1,474 2016= 365	Face-to-face or telephone contact over two weeks, postcards for one year, problem solving therapy, encouragement to access primary healthcare	treatment as usual	Representation to hospital with self-harm within 12 months of the index episode.	<p>2015: lack of effect seen</p> <p>2016: effect seen in intervention group at 3 months (10.4% re-presented) compared to control group at 3 months</p>	2016 – participants were Maori and intervention delivered in a culturally

Author, year	Study type	Level of evidence	Population	Sample size (N)	Intervention	Control	Outcomes	Direction of effect	Comments
								(18% re-presented). Effect not seen at 12 months	appropriate way
Naidoo, Gathuram & Schlebusch, 2014	RCT	II	South Africa; 18+ years; suicide attempt & presented to ED; 2007-2010	688	Buddy intervention support group. 'Buddy' attends 3 x 4 hrs workshops covering info sharing, feedback, management of challenges, coping skills, counselling strategies & info on how to facilitate further care or support; 'buddy' engages in regular follow-up (as per assessment timepoints)	SUPRE MISS brief intervention	Suicide attempt, suicide death	Decrease in intervention (Buddy) 1 death, 68 attempts over 18 mth period, compared to 3 deaths and 103 in control (Supre-Miss)	
Intervention type: Assertive aftercare and case management									
Hvid et al., 2011; Lahoz et al., 2016	RCT	II	People arriving at emergency rooms and clinical departments of the Copenhagen University	133	OPAC	treatment as usual	Repetition of suicidal act	Hvid: Decrease in intervention group: 6/69 repeat suicidal acts in intervention group, 14/64 in control group.	Lahoz 5 year follow-up study: The effect on the number of patients repeating a suicide

Author, year	Study type	Level of evidence	Population	Sample size (N)	Intervention	Control	Outcomes	Direction of effect	Comments
			Hospital Amager (Amager is an island and a district of Copenhagen)					Lahoz: slight decrease in repetitions at 5 yr follow-up, 17/69 in the intervention group, 19/64 in the control. 33 repeat suicidal events in intervention group. 36 repeat suicidal events in control group	attempt wears off and is no longer sustainable after 3-4 years. Making and keeping contact seems to be a key factor in preventing suicide
Morthorst et al., 2012 ²	Randomised, parallel group, superiority trial with blinded outcome assessment	III	Patients older than 12 years admitted to regional hospitals in Copenhagen with a suicide attempt within the past 14 days	243	AID	CAMS	Repeated suicide attempt and death by suicide	Increase in intervention group, but not a statistically significant difference. 20/123 (16%) patients in the intervention group represented to hospital with subsequent attempts, compared with 13/120 (11%) in the control group (odds ratio (OR) 1.60,	Self-report data on SH/SA showed opposite effect: 12% in intervention group and 18% in control group. Control group also had access to CAMS model

Author, year	Study type	Level of evidence	Population	Sample size (N)	Intervention	Control	Outcomes	Direction of effect	Comments
								95% confidence interval 0.76 to 3.38; P=0.22)	
Kawanishi et al., 2014; Furuno et al., 2018	Multicentre RCT	II	Patients admitted to ED following suicide attempt & w DSM-IV-TR axis 1 disorder, 20yrs & older	914	ACTION-J	Enhanced treatment as usual	Suicide attempt/death	<p>Kawanishi - No sig diff at end of study BUT post hoc analyses showed lower recurrence of suicidal behaviour up to and including at 6 mths (RR 9.5 (0.32-0.8, p=.003)</p> <p>Furuno - assertive case management significantly reduced the number of overall self-harm episodes during the whole study period by approximately 12%</p>	
Johannessen et al., 2011 ²	Quasi-experimental	III	All individuals admitted to the general	1,304	Follow up of The Baerum Model	treatment as usual	Repeat suicide attempt and suicide death	Similar effect for treatment and control groups: 60/675 (9%) of	

Author, year	Study type	Level of evidence	Population	Sample size (N)	Intervention	Control	Outcomes	Direction of effect	Comments
			hospital after a suicide attempt					intervention cohort repeated an attempt within 6 months of their index episode with 47/629 (7%) for treatment as usual cohort. 80/675 (12%) of intervention cohort repeated an attempt within 12 months of index episode and 70/629 (11%) for treatment as usual cohort at 12 months	
Intervention type: Brief contact interventions									
Comtois et al., 2019	RCT	II	Serving military	658	Text messages	treatment as usual	Current suicidal ideation; suicide risk incidents (hospitalisation or medical evacuation)	Significant reduction in repeat suicide attempts. No significant effect of likelihood or severity of current suicidal ideation or likelihood of suicide risk incident	

Author, year	Study type	Level of evidence	Population	Sample size (N)	Intervention	Control	Outcomes	Direction of effect	Comments
Kapur et al., 2013	Pilot RCT	II	Manchester residents aged over 18 years who presented to EDs in the city with self-harm during Nov 2010 and May 2011	66	Information leaflet, telephone calls, letters	treatment as usual	Feasibility and repeat episode of self-harm resulting in hospital attendance in 12 months	Increase in intervention group. 12 month repeat rate was 34.4% compared to 12.5% in the treatment as usual group (odds ratio (OR) 3.67, 95% CI 1.0-13.1, P=0.046. The total number of episodes of repeat self-harm over 12 months was higher in the intervention group (41 v 7)(incidence rate ratio (IRR) 5.86, 95% CI 1.4-24.7, P=0.016).). Not significant after adjusting for baseline risk factors	Feasible although only 60% of screened pts met eligibility criteria and a significant proportion were not contactable. Repeat episodes were measured using medical records, not self-report
Carter et al., 2015	RCT	II	Patients admitted to hospital for self-poisoning	772	Eight postcards over a 12-month period, plus treatment as usual	treatment as usual	Admission for repeat self-poisoning	No difference in proportion of participants with repeat self-poisoning	This intervention was more effective for

Author, year	Study type	Level of evidence	Population	Sample size (N)	Intervention	Control	Outcomes	Direction of effect	Comments
								(24.9% vs. 27.2%). Number of self-poisoning incidents in the intervention group was lower than in control group (incident risk ratio 0.54, 95% CI 0.37-0.81)	women than for men
Studies demonstrating other outcomes									
Pfeiffer et al., 2018	Pilot RCT	II	Adult psychiatric inpatients, suicidal ideation or suicide attempt at admission and a Beck Scale for Suicidal Ideation score of 5 or more	70	Peer specialist intervention titled Peers for Valued Living (PREVAIL) to reduce suicide risk, incorporating components of motivational interviewing and psychotherapies targeting suicide risk	treatment as usual	Acceptability and feasibility	Results were qualitative and focussed on acceptability. Mean number of sessions completed was 6.1. 88% of people assigned to intervention completed at least one meeting with the peer specialist prior to discharge	
Grand Pacific Health, 2019	Pre-post design	IV	Adult patients who have made a SA	260	Next Steps Aftercare Service: Assertive follow-up and case	n/a	Depression, anxiety and stress,	Clinically significant reductions on DASS, helplessness, risk	

Author, year	Study type	Level of evidence	Population	Sample size (N)	Intervention	Control	Outcomes	Direction of effect	Comments
					management, clinician and peer support for 12 weeks, includes session for support person		helplessness, burdensomeness, thwarted belongingness, suicide risk ratings (self-report)	ratings, and burdensomeness. No change in thwarted belongingness	
De Leo et al., 2008 ²	RCT	II	Psychiatric patients at risk of suicide post-discharge		Intensive case management for 12m	treatment as usual	Suicide attempt		
Woden Community Service ACT, 2018	Pre-post design	IV	Patients who presented to ED and other govt health services following a SA	71	TWBSS, ACT: Assertive follow-up and case management	n/a	Depression, anxiety, psychological distress (K10)	Clinically significant reductions in depression, anxiety and distress	
Rickwood, 2008 ²	Pre-post design	IV	Callers to Lifeline who were at risk of suicide	45	Telephone support from volunteer counsellor for up to eight weeks	n/a	Suicidal ideation, coping, resourcing (community, professional, personal)	Decrease in % with ideation, and in frequency and intensity. Increase in coping and resourcing	Included because it was Australian forerunner to current models

Author, year	Study type	Level of evidence	Population	Sample size (N)	Intervention	Control	Outcomes	Direction of effect	Comments
Ernst and Young, 2016	Pre-post design	IV	Patients presenting to ED following SA	13	TWBSS, NT: Assertive follow-up and case management	n/a	Wellbeing (WHO-5)	Increase in wellbeing from intake to end of program of 10 points	

² included as seminal studies that have demonstrated specific outcomes or were ground-breaking nationally or internationally

Appendix C: Evaluation status of Australian services (where known)

Service	Location	Evaluation status
TWBSS	Newcastle	Comprehensive evaluation with historic controls due for public release late 2019
Next Steps	Illawarra/Shoalhaven	Preliminary evaluation complete (included), comprehensive evaluation due for completion 2020
SP Connect	Central and Eastern Sydney (POWH, St Vincents, RPAH)	No evaluation completed or planned
Anglicare Aftercare	Adelaide Hills, South Australia	Some data collected (e.g. engagement) but no formal evaluation
Pika Wiya Aboriginal Health Service	Port Augusta, South Australia	Evaluation planned, led by U of Melb and Adele Cox
TWBSS	Casey, Victoria	Some evaluation underway, incomplete
TWBSS	Australian Capital Territory	Evaluation complete (included)
LifeLine Aftercare Outreach	Macarthur/SW Sydney	YES survey completed
TWBSS	Brisbane North PHN	Evaluation underway (AISRAP), complete late 2019
Lotus Suicide Prevention	Gold Coast, Queensland	No formal evaluation
TWBSS	Lismore/Tweed, NSW	No evaluation yet
TWBSS	Grafton, NSW	No evaluation yet
The Seasons Program	North Sydney, NSW	Initial response via email, evaluation status unclear

Appendix D: Components that contribute to effectiveness of the model

Component of model	Description	Evidence level	Comments
Focus on therapeutic alliance	Client-rated strength and quality of relationship with counsellor or other service provider	The only factor examined using mediational analysis to show an effect on repeat suicide attempts	May be influenced by (1) qualities of the counsellor (i.e. caring and non-judgemental), and (2) culture and qualities of the organisation that are reflected in its service model, support for staff to support their clients, and to reduce staff turnover
Rapid follow-up	Contact is made within 48 hours of discharge from hospital	In all the models showing no effect on repeat SA/SH, rapid follow-up was absent. In seven of the 10 effective models, rapid follow-up was present	This is backed by epidemiological research showing that period immediately after discharge is high-risk for a reattempt
Duration of service	Length of time service is provided	There was no clear relationship between duration and effectiveness in the peer-reviewed literature	Some evidence that for a small group of clients, there is benefit in longer-term support
Case management and integration with clinical care	A case manager works with patient to identify and address psychosocial goals	Evidence is mixed: four of the 10 effective models used a case management approach	A combination of clinical and non-clinical support may be most effective. Top goals identified by clients include non-mental health goals (vocational, financial, social)
Frequency of contact	Contact is at least weekly in the first month, then at least monthly for first three months	Most effective models had frequent contact in the first month, tapering thereafter	
Mode of contact	At least one session is face to face before using telephone and other modes of follow-up (letter, postcard, text)	Seven of the studies showing a reduction in SA/SH had at least one face-to-face contact before initiating other forms of contact	It is possible that this is related to therapeutic alliance and engagement

Involvement of support person (family and/or carers)	Contact with a support person either face-to-face or over the telephone – psychoeducation, how to support patient and self.	Studies showing the largest effects had one or more sessions with a family member. Four of the 10 studies showing a reduction in SA/SH included a family member. In the one youth study included in the review, there was family contact.	There is work to be done on how best to achieve this. The services who provided information for this review consistently said that they struggle to get service users to identify a support person.
Assertive follow-up	Where service is unable to contact patient, multiple methods are used to re-establish and maintain contact (telephone, text, letter).	Direct evidence from this review is mixed (follow-up procedures were not well documented in some studies)	This component is inferred from the finding that patients who stay engaged with the service have better outcomes.
Continuity of relationship with staff	As much as possible, contact with the patient is with the same staff member.	Eight of the 10 studies showing a reduction in SA/SH had continuity of staff as a principle. Previous epidemiological research showing that staff turnover and other loss of continuity is a risk for reattempt	This component is likely related to therapeutic alliance. It has implications for how aftercare services are managed and how they support their staff.