

# Evidence synthesis of the research on Suicide Prevention and Postvention; Aotearoa New Zealand and International Perspectives

Dr Sarah Fortune<sup>1</sup>, Dr Vartika Sharma<sup>1</sup>, and Tania Papalii<sup>2</sup>

1

Department of Social and Community Health, School of Population Health,  
The University of Auckland.

<sup>2</sup> Northland District Health Board.

June 2023.

Citation: Fortune S, Sharma V, Papalii T, et al. 2023. *Evidence Synthesis of the Research on Suicide Prevention and Postvention: Aotearoa New Zealand and International Perspectives*. Wellington: Ministry of Health

# Table of Contents

<b>EXECUTIVE SUMMARY</b> .....	<b>1</b>
<b>BACKGROUND</b> .....	<b>7</b>
DESCRIPTION OF THE INTERVENTION .....	9
HOW DO THE INTERVENTIONS WORK? .....	11
WHY IS IT IMPORTANT TO DO THIS REVIEW? .....	12
OBJECTIVES .....	12
<b>METHODS</b> .....	<b>14</b>
A. TYPES OF PARTICIPANTS .....	14
<i>Participant characteristics for inclusion:</i> .....	14
<i>Settings for inclusion:</i> .....	14
B. TYPES OF STUDIES .....	14
C. TYPES OF INTERVENTIONS .....	15
D. SEARCH TERMS .....	15
E. OUTCOME MEASURES .....	17
<i>i. Key outcomes</i> .....	17
<i>ii. Hierarchy of outcomes</i> .....	17
F. SEARCH METHODS FOR IDENTIFICATION OF STUDIES .....	17
G. DATA COLLECTION AND ANALYSIS .....	18
H. SEARCH RESULTS .....	21
<b>RESULTS</b> .....	<b>22</b>
1. LEVEL OF INTERVENTION: UNIVERSAL .....	22
Media reporting guidelines .....	23
Mass media campaigns .....	24
Restricting access to jumping locations .....	25
Restriction of other means of suicide .....	27
Gun ownership .....	27
Ingestion of pesticides .....	27
Paracetamol .....	28
Hanging .....	28
Alcohol .....	29
2. LEVEL OF INTERVENTION: SELECTIVE .....	30

Risk assessment .....	30
Suicide risk stratification .....	31
Gatekeeper training .....	32
Peer and social support.....	34
Surveillance of behaviour using video/CCTV.....	36
Surveillance of online behaviour.....	36
<b>3. LEVEL OF INTERVENTION: INDICATED.....</b>	<b>37</b>
Psychological Therapy's .....	37
eHealth approaches for those experiencing suicidal distress .....	40
Treatment for alcohol use problems.....	44
Pharmacological interventions in adult populations.....	45
Pharmacological treatment of depression in young people .....	46
Ketamine .....	46
Lithium .....	47
Seizure therapy and non-invasive brain stimulation .....	47
Systems of care in Aotearoa New Zealand.....	48
<b>4. INTERVENTIONS FOR SPECIFIC SETTINGS .....</b>	<b>50</b>
Workplaces - overview.....	50
Workplaces - First responders .....	50
Workplaces - healthcare professionals in healthcare settings.....	50
Primary Care as a setting .....	52
Rural settings .....	53
Education settings.....	54
<b>5. TARGET POPULATION GROUPS.....</b>	<b>57</b>
Youth.....	57
Children in care .....	62
Rainbow youth.....	63
Older Adults .....	64
Men.....	65
People in prisons.....	66
Psychiatric in-patients.....	67
Military, soldiers, and veterans.....	68
Refugees and displaced persons .....	70
People experiencing homelessness .....	70
People with diagnosed mental health conditions .....	71
People with diagnosed physical health conditions .....	72
<b>6. LEVEL OF INTERVENTION: MULTILEVEL INTERVENTIONS.....</b>	<b>72</b>
<b>POSTVENTION .....</b>	<b>76</b>
<b>1 LEVEL OF INTERVENTION: MULTILEVEL .....</b>	<b>76</b>
<b>2 LEVEL OF INTERVENTION: UNIVERSAL.....</b>	<b>77</b>

3 LEVEL OF INTERVENTION: SELECTIVE .....	77
<b>INDIGENOUS PEOPLES .....</b>	<b>79</b>
INTERNATIONAL EVIDENCE: .....	79
SUICIDE PREVENTION INTERVENTIONS DELIVERED IN AOTEAROA NEW ZEALAND FOCUSING ON THE GENERAL POPULATION .....	81
Aotearoa New Zealand suicide prevention interventions for all populations.....	81
Aotearoa New Zealand suicide prevention interventions for Māori and Pacific Populations.....	82
Aotearoa New Zealand suicide prevention programme evaluations for Pacific communities .....	83
Aotearoa New Zealand suicide prevention programme evaluations for Māori communities .....	85
Annual Māori Suicide Prevention Symposia .....	87
Aotearoa New Zealand suicide prevention programme evaluations for Māori communities – Te Rau Ora.....	88
POSTVENTION IN AOTEAROA NEW ZEALAND .....	94
<b>CONCLUSIONS AND RECOMMENDATIONS.....</b>	<b>96</b>
WHAT WE NEED TO ACHIEVE GREATER GAINS IN SUICIDE PREVENTION .....	103
<b>REFERENCES.....</b>	<b>105</b>
<b>APPENDICES.....</b>	<b>129</b>
APPENDIX A: PRISMA FLOW DIAGRAMS.....	129
APPENDIX B: SUMMARY TABLE OF INCLUDED REVIEWS .....	131
APPENDIX C: INFORMATION PROVIDED BY TE RAU ORA.....	197

## Executive summary

There have been some encouraging signs of a reduction in lives lost to suicide in the past few years, after a decade of relatively static rates (Pirkis et al., 2021). Evidence-based interventions are required to build on this momentum (World Health Organization, 2014). Generating evidence in suicide prevention is complex (Hawton & Pirkis, 2017); several reviews have synthesised evidence regarding interventions for suicidal behaviour, but have focused only on RCTs (Calear et al., 2016b), on a specific intervention type (Hawton et al., 2016b), specific population groups (Witt et al., 2021b), or in specific settings (Xue, Yang, Xu, Shi, & Liu, 2020), so do not cover the full spectrum knowledge we need to support suicide prevention in Aotearoa. This evidence synthesis summarises the most up-to-date and relevant local and international literature on suicide prevention and postvention. The findings will provide direction for future suicide prevention action plans and highlight knowledge gaps. We have included reviews and review of reviews which had a primary aim of suicide prevention or postvention and assessed a suicide-related outcome such as death by suicide, suicide attempt, self-harm, suicidal ideation (thoughts, feelings, plans, threats), suicide risk, suicidal orientation, non-suicidal self-injury, suicidal behaviour, suicidality, suicide potential, parasuicide, suicidal distress or any other outcome described as a suicide-related behaviour by the review authors. This review included interventions designed and implemented at different suicide prevention levels, for different population groups, in all types of settings, and includes any type of intervention, delivered in any format.

It is important to recognise that a great deal of the extant literature on suicide prevention reflects a Western, individualised, and often psychiatric perspective on suicide. The research methodologies associated with this paradigm have a strong positivist tradition. We acknowledge the centrality of Te Tiriti o Waitangi to suicide prevention in Aotearoa. We acknowledge this tension throughout the review, and have conducted two review strategies for this reason 1) an overarching review of reviews and 2) a supplementary search strategy focusing on suicide prevention in Aotearoa New Zealand, particularly among Māori and Pacific peoples have been included irrespective of their publication status and if published, irrespective of the year of publication, study design and whether or not they were reviews.

The search for reviews across a number of databases produced a total of 30,375 articles. After duplicates were removed, 18,499 articles remained. After screening all titles and abstracts and subsequent full text reviews, 285 reviews were included in the review. The additional search for Māori, Pacific and New Zealand intervention studies across scientific databases, theses depositories, organisations, professional networks and key stakeholders produced 248 results. After screening the studies and reports, 22 were included in this review.

The following suicide prevention strategies are worth pursuing in Aotearoa New Zealand based on the evidence we have reviewed.

**Universal approaches** are important and to date have been relatively under-utilised in Aotearoa New Zealand. It seems likely that these approaches have the potential to prevent deaths among communities who are hard to reach using indicated approaches, particularly men, young people and Māori.

- Address the structural determinants associated with suicide in Aotearoa including poverty, loss of land and language, discrimination and violence (Ngā Pou Arawhenua, Child and Youth Mortality Review Committee, & Suicide Mortality Review Committee, 2020)
- In periods of recession increase expenditure as a proportion of GDP focusing on unemployment benefits, active support of return to labour market programmes, social welfare (Kim, 2018), and robust employment protection legislation (Shand, Duffy, & Torok, 2021). This approach is important in preventing male deaths by suicide
- Maximise the potential effectiveness of responsible media reporting guidelines by increasing adherence to safe reporting guidelines in Aotearoa New Zealand. This approach is important in preventing young deaths by suicide
- Restrict access to locations associated with jumping and instal physical barriers, signage and telephones to support help-seeking, increase the chances of intervention through use of surveillance and/or staff training, update technology for faster stopping of trains. This approach is important in preventing deaths by suicide in urban areas.
- Continue to restrict access to other methods of suicide including guns (important to prevent deaths among older men), carbon monoxide gas, pesticides (important to prevent deaths in the Asian community)
- Pursue stronger restrictions in access to paracetamol (number of tablets in a pack, number of packs which can be purchased, pharmacy only sales), salicylates, dextropropoxyphene,

barbiturates, and caffeine tablets, opioids with appropriate monitoring of the impact of such changes.

- Target acute alcohol intoxication and alcohol misuse by reducing access to alcohol, and increasing price (important to prevent deaths among men younger people and Māori)
- Ensure adherence to existing requirements in specific settings to reduce access to hanging as a method of suicide, including inpatient psychiatric settings, police stations and prisons (important to prevent deaths in Māori who are over-represented in these settings).
- There is an urgent need to ensure adherence to the basic approaches of adequate staffing and service user visibility in these settings which are strongly associated with risk of death and other adverse outcomes in these settings.

### **Selective interventions**

- There needs to a radical rethink about the expectations of suicide risk assessments given our limited ability to predict who will engage in self-harm or die by suicide. The use of risk stratification, based on suicide risk assessment for deciding who can, or cannot access help services, is problematic and needs to be recognised as such. Assessments with those experiencing suicidal distress needs to focus on the factors contributing to that distress, that are amenable to intervention and resources directed towards providing effective solutions to those difficulties.
- There is a great deal of interest, and indeed clinical innovation, in the area of peer support and social support interventions. To operate effectively, peer support by those with lived experience of suicidal distress needs to be purposeful, well-planned, appropriately resourced and respect the expertise of peers with lived experience. Peer support is not the use of peers with lived experience as a free or low-cost workforce.
- There needs to be recognition that evidence for gatekeeper training is mixed; this approach may a valid method of improving the immediate knowledge, skills and self-efficacy of gatekeepers but this approach is unlikely to have a measurable impact on suicidal behaviour at a community level. It also needs to be recognised that positive training effects diminish over time, typically 4-6 months, so long-term and sustained change is not achieved by current gatekeeper training interventions. Novel approaches to addressing these short-comings in gatekeeper training are being investigated locally.
- Workplace interventions focusing on first responder (e.g., military, police, firefighters, ambulance staff) suggests that multilevel interventions are associated with reduced suicide

rates in these groups. Health and social care workers are a group experiencing significant pressures and require specific focussed interventions which focus on the organisational sources of their distress.

- There is a need for a greater focus on the prevention of all types of violence and particularly sexual violence as part of suicide prevention.
- General practice presents an attractive location for suicide prevention initiatives. In Aotearoa New Zealand, the delivery of more psychological support in primary care settings may be offering benefit to suicide prevention, however are yet to be evaluated and adherence with effective MDT integration between mental and physical healthcare clinicians is required.

### **Indicated interventions**

- Most psychological interventions focus on individuals as the unit of intervention, which is at odds with models of wellbeing such as Te Whare Tapa Wha and the emerging evidence of good practice from Pacifica and Māori suicide prevention efforts in Aotearoa New Zealand. The key unit of intervention is whānau
- Less costly, briefer, easy to deliver and scalable psychological interventions are equally likely to be effective as technically complex, long term, hard to deliver and less scalable interventions (Fox et al., 2020). In particular, there is a mis-perception that DBT (or DBT-A) is the only effective intervention for those engaging in self-harm. This perception may inadvertently deskill frontline workers who are not DBT trained, and reduce access to help despite the evidence that good quality treatment as usual is also effective.
- The digital delivery of interventions for suicidal ideation and self-harm may be a safe and acceptable option for those unwilling or unable to attend face-to-face delivery however, we need to understand more about the risk-benefit ratio of digital delivery. Effectiveness is increased if interventions are designed to specifically target suicide-related behaviours (e.g., suicidal thoughts) rather than associated difficulties such as depression. It is also important when developing or purchasing these interventions to understand the impact of such as rapidly increasing user expectations and high drop-out rates.
- Similar to other intervention approaches, evidence supporting the use of brief interventions in Emergency Department settings, is mixed but there is a great deal of scope for enhanced adherence with best practice guidelines and a focus on compassionate care in Emergency Department settings.



- There is uncertain evidence regarding pharmacological interventions in adults who engage in self-harm, including non-suicidal self-injury (NSSI)
- Newer antidepressants may reduce depressive symptoms in a small and clinically unimportant way and may “*at least slightly*” increase the odds of suicide-related outcomes compared with placebo in children and adolescents. This creates a complex set of information for clinicians and whānau to navigate in creating a treatment plan for a young person and is not widely appreciated in the community
- Recent reviews suggest that ketamine, when used as an intervention for treatment resistance depression in adults, may have a positive short-term effect in reducing suicidal ideation, however there is more work to be done to understand how best to deliver this treatment approach in public mental health settings.
- A number of organisations have over many years investigated systems of care to help reduce deaths by suicide among people in inpatient mental health settings. The findings of these reviews are fairly stable and tend to include recommendations such as removal of ligature points, management of absconding and improvements to assessment, which almost always stated in existing policies and procedures. We must now turn our attention to the implementation of recommendations, the leadership and organisational characteristics that foster meaningful change
- For young people the evidence is mixed for suicide prevention initiatives. Areas of promise include mental health awareness training, which appears to be effective and cost-effective amongst school students.
- Children in care have not received a great deal of focus, but are a group with multiple adversities; interventions aimed at improving foster care environments and relationships show promise
- Early findings for initiatives for rainbow youth are promising, future work needs to differentiate between the needs of specific sexual and gender minorities. Attachment based family interventions show promise
- With an aging population in Aotearoa, more attention needs to be directed to the development and investigation of safe, culturally responsive, and effective initiatives for this population – the detection and treatment of depression appears protective for women, but not men and there are some concerns about the use of medications for in this population. Interventions that target loneliness, address physical frailty, poverty and enhance social connection are promising (for women). Gate-keeper training for rest home

staff may have some impact on the way suicidal residents are cared for but there is no evidence of effect on suicidal ideation or behaviours

- The evidence for effective postvention is beginning to emerge; recent investment in interventions for those bereaved by suicide in Aotearoa needs to be complemented with work to increase facilitation of culturally specific grieving practices without pathologising grief or representing it as a mental health crisis.
- Funding of bereavement support needs to recognise there is a great deal of heterogeneity in how whānau experience grief and increased focus on children (of all ages) who lose a parent or caregiver to suicide.

Te Tiriti o Waitangi is central to the success of suicide prevention in Aotearoa. A clear commitment to a nuanced and appropriately resourced national suicide prevention action plan will support success. Other key elements are:

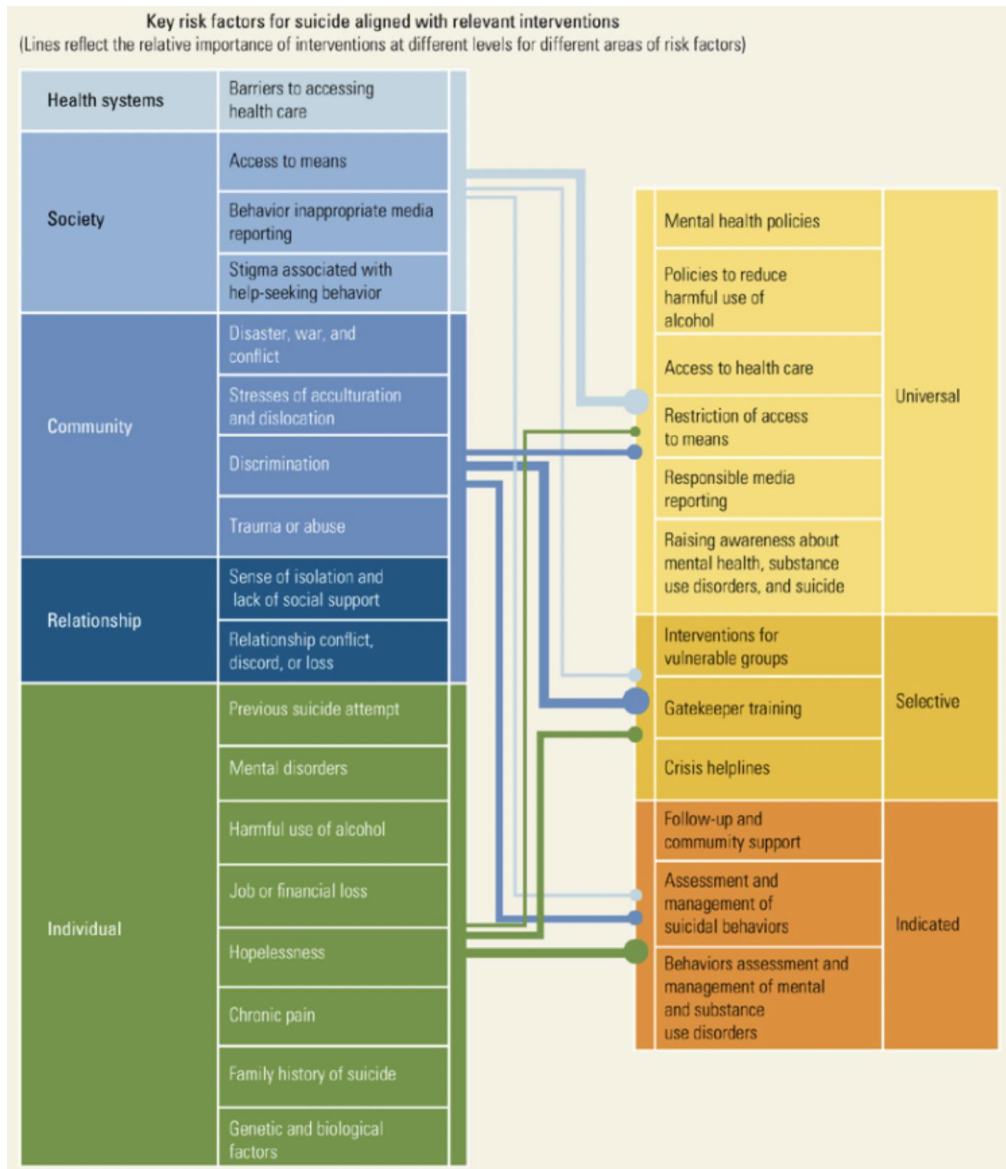
- An agreed and sustained outcomes framework to support greater clarity and communication about the purpose of any given intervention and the desired outcome. Te ao Māori is central to such a framework. This outcomes framework needs to be publicly reported so the mahi can move forwards, rather than compromising the full impact resources by re-doing and re-learning work already done. There needs to be more clarity about the rationale connecting interventions for wellbeing and expectations for suicide prevention.
- A national workforce development plan with core competencies, minimum standards for curriculum development for undergraduate and post qualification training. There needs to be clear signaling about the nature and quality of training required for different segments of the workforce and signally about suicide prevention training offerings and their suitability for contemporary Aotearoa New Zealand.
- Real time surveillance of both self-harm and suicide to support the evaluation of effectiveness of interventions.
- Research funders need to focus on studies which integrate Te ao Māori, are well designed trials using standardised measures of suicide outcomes, address the tendency to exclude participants due to elevated suicide risk, address intervention fidelity, and include cultural responsiveness as safe practice.

## Background

Suicide is a complex phenomenon which occurs due to the convergence of genetic, psychological, social, cultural risk factors such as colonisation, loss of land, language and identity combined with experiences of trauma and loss (Zalsman et al., 2016). Over 800,000 people die by suicide every year, accounting for 1.4% of premature deaths worldwide. Suicide can occur at any point in the lifespan with highest rates among those over 70 years. It is also the second most frequent, and in some countries the leading, cause of death among young people aged 15–24 years (World Health Organization, 2014). Globally, suicide rates are higher for indigenous populations than for non-indigenous populations in the same countries (De Leo, Svetlicic, & Milner, 2011). In Aotearoa New Zealand, the most recent Ministry of Health data indicates an age standardised total population suicide rate of 13.1/100,000 in 2019, with those aged 30 – 34 years having the highest rate in that year. Māori carry a disproportionate burden of suicide in Aotearoa New Zealand, with Māori males having a suicide rate 1.8 times greater than non-Māori males and Māori females being 2.3 times more likely to die by suicide compared with non-Māori females (Ministry of Health, 2024).

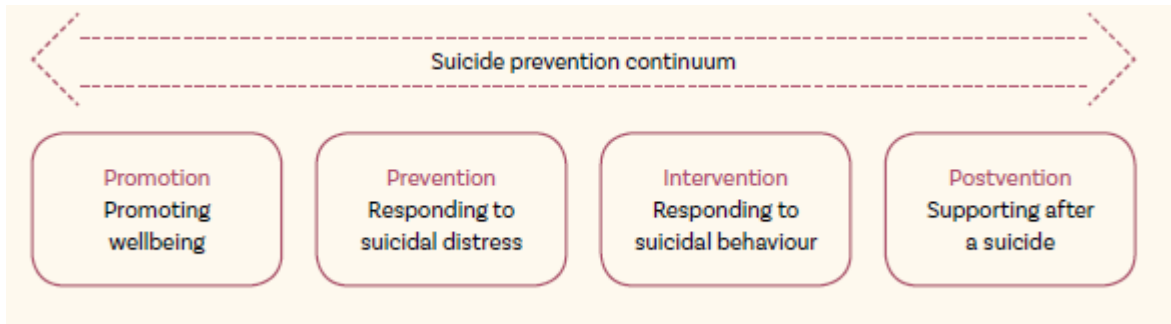
There have been some encouraging signs of a reduction in lives lost to suicide in the past three years (Pirkis et al., 2021), after a decade of relatively static rates (Ministry of Health, 2022). Suicide prevention activities need to build on this momentum, while also extending our understanding of how to reduce deaths among vulnerable groups such as children in care, prisoners, consumers of mental health services and members of the rainbow community (Suicide Mortality Review Committee, 2016; SUMRC, Child and Youth Mortality Review Committee, & Nga Pou Arawhenua, 2020). Suicide is a significant psychosocial stressor for those bereaved by suicide; for every death by suicide it is estimated that more than ten people are profoundly affected (Jordan & McIntosh, 2011) and 135 people knew the deceased (Cerel et al., 2019). People bereaved by suicide are at increased risk of experiencing suicidal behaviour themselves, in addition to experiencing poor mental health outcomes such as depression, anxiety, post-traumatic stress disorder and substance misuse (Andriessen, Krysinska, & Grad, 2017; de Groot & Kollen, 2013). Therefore, suicide postvention is increasingly recognised as an important element of an overall suicide prevention strategy.

The World Health Organisation recommends comprehensive suicide prevention strategies including universal, selective, and indicated interventions (World Health Organization, 2014) and are outlined below with examples of interventions at each of the levels (Patel, Chisholm, Dua, R. Laxminarayan, & Medina-Mora, 2015).



Significant reductions in suicide at a population level are unlikely to be achieved with isolated interventions that are unsustainable or fail to connect with an integrated multilevel prevention strategy (Beautrais, 2005; Bertolote, 2004). He Tapu te Oranga o ia Tangata, the New Zealand Suicide Prevention Strategy (2019-2029) and Suicide Prevention Action Plan (2019-2024) guide suicide prevention activities in Aotearoa New Zealand (Ministry of

Health, 2019). These documents outline a continuum approach of promoting wellbeing, prevention (responding to suicidal distress), intervention (responding to suicidal behaviour) and postvention (support following a suicide) shown in Figure 1 below.



**Figure 1**

*The current approach to suicide prevention in Aotearoa New Zealand (Ministry of Health, 2019)*

Tūramarama ki te Ora is a key document when considering suicide prevention in Aotearoa New Zealand (Durie, Lawson-Te Aho, & Naera, 2017). The key objective is to reduce suicide deaths and other suicidal behaviours in Aotearoa New Zealand, particularly among population groups with higher numbers of suicide deaths and higher rates. The strategic plan also emphasises the need to improve the dissemination of evidence-based information to suicide prevention stakeholders including individuals, their family and communities. In addition, this document highlighted gaps in research evidence that should inform a suicide prevention research agenda.

### **Description of the intervention**

In general, suicide prevention interventions are implemented across three levels; universal programmes that target a whole population, selective programmes targeting subgroups thought to be at elevated risk of suicidal behaviour such as those with alcohol or substance abuse problems, youth, or members of the Rainbow community; and indicated programmes that target specific individuals who display symptoms or behaviours indicative of risk for suicide such as those attending hospital following an act of self-harm (Haggerty & Mrazek, 1994).

Common universal suicide prevention programmes include, but are not limited to, mental health and/or suicide awareness education programmes and skills development programmes that are delivered to everyone in an intervention setting such as schools or workplaces. Universal interventions are designed to provide necessary skill sets that act as protective factors, such as coping and problem-solving skills, which may be delivered via different means including face-to-face or using digital platforms (Robinson et al., 2018a; Stefanopoulou et al., 2020; Zalsman et al., 2016). Universal prevention includes restricting access to certain methods of suicide such as paracetamol, firearms or jumping locations. Media reporting guidelines, mental health and alcohol control are also examples of this approach.

Common selective suicide prevention approaches include gatekeeper training programmes where key community members are upskilled to recognise the early symptoms of suicidal distress and provide relevant support. Peer support programmes usually involve training peers in specific skills to maximise support to those who disclose suicidal distress (Rowe et al., 2014). Screening programmes involve the administration of questionnaires or interviews to identify people at elevated risk of suicidal behaviour. Those detected as being of increased concern may be referred for mental health treatment, or offered a specific prevention intervention (Robinson et al., 2018a; Winicov, 2019).

Indicated suicide prevention interventions target individuals who have engaged in self-harm or have suicidal ideation in order to provide specific interventions. These interventions, such as cognitive behavioural therapy or dialectical behavioural therapy (Hawton et al., 2016b; Ougrin, Tranah, Stahl, Moran, & Asarnow, 2015), have typically been developed and evaluated in clinical rather than non-clinical settings. Given the prevalence of mental illness among people who engage in suicidal behaviour, pharmacological treatments such as antidepressants, antipsychotics, anxiolytics (including both benzodiazepines and non-benzodiazepine anxiolytics) (Hawton et al., 2015b), mood stabilisers (including anticonvulsants and lithium), and other pharmacological agents such as ketamine (Mann, Michel, & Auerbach, 2021) are considered indicated interventions.

Suicide postvention activities focus on those bereaved by suicide to maximise supports and reduce the probability of contagion. Much of the published literature in this area has focused on bereavement supports for family, friends and peers affected by suicide (e.g., Szumilas & Kutcher, 2011). A recent review (Andriessen et al., 2019a) suggests that postvention

interventions can be conceptualised within a public health framework; universal interventions for people with low levels of grief and relatively little impact of suicide such as psychoeducation or printed resources; selective interventions for those experiencing moderate or severe grief reactions such as peer support, and indicated interventions for people those experiencing mental health problems and problematic grief such as grief-focused therapy. To date there has been very little evaluation of the effectiveness of systems and processes to support postvention activities (Andriessen et al., 2019a).

Successful suicide prevention is complex. To maximise the chances of success, suicide prevention activities need to target several populations or several levels within the USI model. Designing, delivering and evaluating interventions for different population groups in different settings simultaneously within a constrained budget is challenging (van Der Feltz-Cornelis et al., 2011).

### **How do the interventions work?**

Suicide prevention interventions work in different ways to reduce suicidal behaviour. Universal interventions aim to increase mental health and suicide prevention literacy and increase the likelihood of people seeking help when it is needed. It is likely that increased help-seeking is due to multiple factors - improved literacy, reduced stigma as well as improved attitudes to mental health and suicide-related behaviours (Rowe et al., 2014). There is also a role for increasing protective factors such as coping skills and problem-solving skills. Selective interventions are more directly focused on ensuring early detection to facilitate access to care using activities such as screening for to identify those at increased risk of suicidal behaviour. The mechanism of action of indicated interventions depends on the underlying theoretical model as a range of psychosocial and pharmacological interventions are available to prevent suicidal behaviour. For example, cognitive behavioural therapy is designed to identify, challenge, and modify the unhelpful way that individuals might interpret events and emotions leading to suicidal behaviour. Dialectical behavioural therapy (DBT) focuses on reducing life-threatening behaviours by increasing the ability to accept, and manage painful emotions. Other psychosocial interventions include mentalisation based therapy, group-based psychotherapy, mindfulness training, enhanced assessment approaches and family interventions (Hofstra et al., 2020; Witt et al., 2021b).

Pharmacological interventions may be explored as a treatment option for those experiencing mental illness. For example, anti-depressants aim to reduce depressive symptoms with the aim of also reducing suicidal distress. Antipsychotic drugs may reduce arousal levels. Anxiolytics target anxiety and mood stabilisers may reduce self-harm via a serotonin-mediated reductions in impulsivity and aggression (Witt et al., 2021b).

### **Why is it important to do this review?**

There have been some encouraging signs of a reduction in lives lost to suicide in the past three years, after a decade of relatively static rates (Pirkis et al., 2021). However, evidence-based interventions are required to build on this momentum (World Health Organization, 2014). Generating such evidence in suicide prevention is complex (Hawton & Pirkis, 2017) as suicide is a relatively rare event, so it is often challenging to demonstrate the impact of interventions on this outcome. Moreover, many interventions do not lend themselves to being tested using randomised controlled trials (RCTs), typically considered the gold-standard (Goldney, 2005). Therefore, assessing changes in other related outcomes such as self-harm and suicidal ideation is a commonly used approach. Several reviews have synthesised evidence regarding these proxy outcomes but are limited due to only including RCTs (Calear et al., 2016b), focussing on a specific intervention type (Hawton et al., 2016b), or a specific population group (Witt et al., 2021b), or in a particular setting (Xue et al., 2020) and thus do not cover the full spectrum of the challenge. Therefore, there is need for this comprehensive overview of the effectiveness of a diverse range of interventions, implemented at different levels and for different population groups, particularly in context of the unique opportunities and challenges that exist in Aotearoa.

### **Objectives**

This evidence synthesis summarises the most up-to-date and relevant local and international literature on suicide prevention and postvention. This includes interventions designed and implemented at different suicide prevention levels, for different population groups in all types of settings, including any type of intervention delivered in any format (Robinson et al., 2018a).

It is important to recognise that a great deal of the extant literature on suicide prevention reflects a Western, individualised, and often psychiatric perspective on suicide. The research



methodologies associated with this paradigm have a strong positivist tradition. We encourage the reader to consider the difference between no evidence of effect and evidence of no effect. We acknowledge this tension throughout the review and have conducted two review strategies for this reason 1) an overarching review of reviews and 2) a supplementary search strategy focusing on suicide prevention in Aotearoa New Zealand, particularly among Māori and Pacific peoples have been included irrespective of their publication status and if published, irrespective of the year of publication, study design and whether or not they were reviews.

This review provides an up-to-date summary for the Suicide Prevention Office on the research evidence for suicide prevention in the context of contemporary Aotearoa New Zealand. The findings will provide direction for future suicide prevention action plans and highlight research priorities to address knowledge gaps.

## Methods

### A. Types of participants

#### Participant characteristics for inclusion:

- Any population group (e.g., men, indigenous, prisoners, rainbow community);
- Any age group (e.g., older adult, youth);
- Any sexual/gender identity;
- With or without lived experience of any another diagnosis (psychiatric or non-psychiatric) where suicidal behaviour may be a comorbid issue but was the focus of the intervention. For example, suicide prevention interventions for patients with bipolar disorder;
- For postvention, study participants should include people bereaved by suicide.

#### Settings for inclusion:

- Any setting (e.g., workplace, education, community, psychiatric hospital, prison)

### B. Types of studies

We have included reviews and review of reviews (RoR) which had a primary aim of suicide prevention or postvention and assessed a suicide-related outcome such as death by suicide, suicide attempt, self-harm, suicidal ideation (thoughts, feelings, plans, threats), suicide risk, suicidal orientation, non-suicidal self-injury, suicidal behaviour, suicidality, suicide potential, parasuicide, suicidal distress or any other outcome described as a suicide-related behaviour by the review authors.

#### *Types of studies for inclusion:*

- Reviews/RoR including studies using any type of research design (experimental or non-experimental)
- Clearly identified by the authors as a review, with reference to a systematic search method of at least one academic database
- With or without meta-analysis

- Reviews/RoR on postvention which included people bereaved by suicide with a primary outcome on grief, psychosocial and suicide related outcomes

*Types of studies for exclusion:*

- Reviews/RoR where the primary outcome was not preventing or reducing suicide-related behaviour
- Reviews/RoR that did not measure or report on a suicide-related outcome.

In addition, publications related to suicide prevention/postvention interventions in Aotearoa New Zealand, particularly among Māori and Pacific peoples have been included irrespective of their publication status and if published, irrespective of the year of publication, study design and whether or not they were reviews.

### **C. Types of interventions**

We included reviews/RoR that investigated the efficacy of any intervention type, such as:

- psychosocial universal, selective and indicated interventions to prevent suicidal behaviour
- pharmacological interventions to reduce suicidal behaviour
- postvention programmes for those bereaved by suicide

We excluded studies that examined the efficacy of interventions aimed at promoting wellbeing. While it is acknowledged that such interventions are targeting pathways that may have an impact on suicidal behaviour, unless the primary and explicit aim of the study was stated as reducing self-harm or suicide (including measuring these as outcomes), these reviews/reviews of reviews were outside the scope of this project.

### **D. Search terms**

#### **Search terms used for the Review of Review:**

Suicide/ self-harm related terms:

1. self-injurious behavior/
2. self mutilation/
3. suicide/ or suicide, attempted/
4. (suicid\* or parasuicid\*).ti,ab,kw.

5. (automutilat\* or auto-mutilat\* or selfdestruct\* or self-destruct\* or self harm\* or self-harm\* or selfimmolat\* or self-immolat\* or selfinflict\* or self-inflict\* or selfinjur\* or self-injur\* or selfmutilat\* or self-mutilat\* or self-poison\* or selfpoison\*).ti,ab,kw.
6. (self adj2 (cut or cuts or cutting or cutter\* or lacerat\* or wound or stab or cut\* or burn\* or hang\* or gun\* or fire\* or drown\* or injur\* or inject\* or strangulat\*)).ti,ab,kw.
7. (suicid\* adj2 (behavio\* or attempt\* or distress\* or ideat\* or thought\* or feel\* or plan\* or threat\* or orient\* or potent\* or risk\* or jump\* or fall\*)).ti,ab,kw.
8. (NSSI? or ((nonsuicid\* or non suicid\*) adj2 (self\* or injur\*))).ti,ab,kw.
9. Drug Overdose/
10. ((nonfatal or non fatal) adj2 (overdose\* or over dose\*)).ti,ab,kw.

Study design/ review related terms:

1. systematic review/
2. meta-analysis/
3. (review adj (systematic\* or narrative\* or scop\* or rapid\* or literature\* or review\* or mixed method\* or integrative\* or meta\* or integrat\* or umbrella or qualitative or quantitative or synthes\* or evidence or critical or mixed or mapping or Cochrane)).ti,ab,kw.

**Search terms used for the review of Māori and Pacific people and Aotearoa New Zealand intervention studies:**

Suicide/ self-harm related terms:

*Same as above*

Population terms:

1. (indigenous OR Māori OR Maori OR Maaori OR Pacific OR Pasifika OR Tongan OR Samoan OR Fiji\* OR Niue\* OR Tokelau\*).ti,ab,id.

Location terms:

1. (New Zealand OR Aotearoa).ti,ab,id.

## **E. Outcome measures**

### **i. Key outcomes**

- Suicide related outcome

While the aim of any suicide prevention intervention is to reduce the rate of suicide, suicide is a relatively rare event, particularly in intervention studies, that usually have a relatively small number of participants and are undertaken over a relatively short period of time. Given self-harm represents a key risk factor for suicide (Hawton et al., 2015a), it is likely that any reduction in self-harm will have an impact on rates of suicide, therefore self-harm was one of the key outcomes reported on in this review. Other suicide related outcomes commonly reported included suicidal distress, suicide attempt, suicidal orientation, suicidal ideation, suicide threat, non-suicidal self-injury and suicide risk.

We report suicide related outcomes as reported by the included reviews/RoR. For instance, as proportion of individuals reporting SH, frequency of SH, suicidal ideation scores using psychometrically validated measures. These are reported irrespective of how they have been measured; that is by self-report, significant other or assessor/clinician report, health records, or hospital presentation. If multiple ascertainment methods were reported, we report the most commonly used measure across the reviews. For postvention interventions, grief (complicated and uncomplicated), anxiety and depression, suicide specific aspects of grief (guilt, responsibility and rejection), psychological functioning, contagion effect are key outcomes.

### **ii. Hierarchy of outcomes**

We did not restrict our reporting with regards to hierarchy of the outcomes. In reviews/RoR, where outcomes were measured for a range of suicidal behaviours, for example, both suicidal ideation and self-harm, or self-harm and suicidal threat, we report all reported measures.

## **F. Search methods for identification of studies**

For the RoR, we searched the following bibliographic databases, using relevant subject headings, keywords, and search syntax appropriate to each resource. Databases included:

PsycINFO, Medline, Pubmed, Embase, CINAHL, and the Cochrane Library, see section C for the search terms used.

A review filter was included in the search strategy to restrict the search results to 1) reviews and reviews of reviews; 2) published in English; 3) conducted in humans; and 4) published in a peer-reviewed journal between 2011-2021. Where individual studies were suggested by key stakeholders these were hand-searched if they were not included in the reviews/review of reviews.

To identify suicide prevention/postvention interventions in Aotearoa New Zealand, particularly among Māori and Pacific peoples we used a number of additional search methods. Firstly, we sought advice and documents/publications from those working in suicide prevention in Aotearoa through our extensive professional networks. This allowed us to obtain information about interventions that are being delivered but might not be publicly available or available in peer reviewed publications. This strategy was particularly important for identifying small scale interventions that have been developed locally and are responsive to indigenous and other local communities. Additional steps included:

- Conducting a search of bibliographic databases including, PSycINFO, Medline, PubMed, and Embase (with the suicide and self-harm search terms listed as well as population and location terms);
- Conducting a grey literature search of relevant theses from New Zealand Universities, using the Kiwi Research Information Service;
- Conducting an additional check of the first 50 results of Google Scholar;
- Contacting three key funding agencies, including Le Va, Te Rau Ora and Te Puni Kokiri, who have administered community suicide prevention funds for evaluation information and searching for associated publicly available reports.

## **G. Data collection and analysis**

### *i. Selection of studies*

For the RoR, one team member conducted the searches of each database using the developed search strategy developed for this project. Once search results were conducted, results were screened for duplicates. All team members were then involved in screening titles and

abstracts. For each search result, at least two team members independently screened the title and abstract against the inclusion criteria. The full texts of reviews/RoR meeting these criteria were then independently screened by at least two team members to confirm inclusion. Any disagreements were resolved in discussion with the PI. Screening was conducted using Rayyan, a web and mobile application to manage the screening and selection of articles for systematic reviews (Ouzzani, Hammady, Fedorowicz, & Elmagarmid, 2016). Where individual studies were suggested by key stakeholders these were hand-searched if they are already not a part of the included reviews/RoR. Team members who are authors of any included reviews were not involved in decisions involving those reviews. For both the RoR and the review of interventions in Aotearoa New Zealand, we have described the selection process in adapted PRISMA flow charts in Figure 2 and 3 below (Page et al., 2021).

For the review of interventions for Māori and Pacific people in Aotearoa NZ, one team member separately conducted the searches of the listed databases and searched for relevant national level reports from government organisations and local research funding organisations.

#### *ii. Data extraction and management*

All team members were involved in data extraction using a standardised data extraction form. We did not make contact with the review authors to seek any additional information that is not already in the included review/RoR. The following data were extracted from all the included reviews/RoR, published/unpublished studies on suicide prevention interventions for indigenous populations and any included government reports:

- Review characteristics
- Publication information: name of first author, year of publication
- Type of review and evidence synthesis (e.g., Cochrane review, scoping review, review of review, systematic review, narrative review, type of analysis e.g., with or without meta-analysis)
- Objectives of the review
- Period for which publications were included
- Number of included trials/reviews
- Characteristics of included participants (e.g., gender, age, ethnicity, with/without comorbid mental health conditions (to the extent possible))

- Type of setting the interventions were conducted (e.g., mixed settings, clinical settings, prisons, or education settings)
- Description of interventions, including level of interventions (universal/selective/indicated), type of interventions (for example, means restriction/gatekeeper training, psychological therapy), intervention approach (for example, CBT, DBT), intervention settings (to the extent possible)
- Outcomes related to suicidal behaviour (not outcomes that were not relevant to our review)
- Details of meta-analyses, if applicable
- Commonly used standardised tools to measure outcomes in the included studies/review, if available
- Conclusions drawn by the author regarding the efficacy of the intervention/s
- Policy and clinical recommendations mentioned by authors
- Cost-effectiveness of the intervention, if available
- Risk of bias of the included studies in the review/review of reviews (as reported in the review)
- Acknowledged limitations of the review/RoR.

Similar information, was extracted where possible, from the published/unpublished studies on suicide prevention for indigenous and Pacific populations.

### *iii. Data synthesis*

Overall, we used a whole-of-population approach for data synthesis and present a narrative synthesis where we describe the overall effect of different intervention approaches/types on different population groups in different settings, taking into account variations in study characteristics.

The narrative synthesis involved information related to the level of intervention (universal, selective, indicated), target population group (for example, rainbow youth, men, older adults), outcome measures (indicators of success), intervention settings, methodological rigor (sample size, study design) resources involved in delivering the intervention (e.g., physical barriers, pack size, clinicians, teachers), evidence of successful replication in other settings. We did not perform any statistical synthesis of data.



We prioritised reporting of some review findings over others, depending on the type of studies included (for example, reviews including only randomised trials), number of trials included (sample size of the review), the relevance of the evidence (outcome, population/context, or intervention) pertaining to the review question and certainty of the evidence.

#### *iv. Assessment of methodological quality of included reviews*

We did not use any standardised instrument to undertake assessment of the methodological quality of the included reviews. However, we undertook a broad assessment of the review quality, with particular consideration of items such as protocol registry, justification of excluding studies, risk of bias from individual studies included in the review and consideration of risk of bias when interpreting the study results, and sources of funding (particularly for reviews investigating pharmacological interventions) to form an impression of quality. These are included in our summary table (see Appendix B, Table 1) and throughout the review we signal limitations and risk of bias considerations.

## **H. Search results**

The search for reviews across databases produced a total of 30,375 articles. After duplicates were removed, 18,499 articles remained. After screening all titles and abstracts and subsequent full text reviews, 285 reviews were included in the review, see Figure 2 in Appendix A for a flowchart of the literature search and review selection. In addition, Table 1 in Appendix B provides a summary of the reviews included.

The additional search for Māori, Pacific and New Zealand intervention studies across scientific databases, theses depositories, organisations, professional networks, funding agencies, and key stakeholders produced 248 results. After screening the studies and reports, 22 are included in this review.

## Results

### 1. Level of Intervention: Universal

Universal suicide prevention interventions affect entire populations and offer a scalable method to prevent deaths. The most widely researched universal interventions are media reporting guidelines and reducing access to certain methods of suicide and are outlined below.

In a recent qualitative synthesis of universal intervention studies published from 1900 to 2020 (Ishimo et al., 2021), one hundred studies in high income OECD countries were included where suicide mortality was the outcome of interest and were grouped according to the WHO Suicide Prevention Global Imperative position statement (World Health Organization, 2014). Weak evidence of effect was found for men but not women for enhancing access to healthcare via the establishment of suicide prevention centres. Mental health policies, physical barriers to jumping locations, and restricting access to other lethal means were generally found to be effective (Ishimo et al., 2021). This review suggested that national suicide prevention initiatives and universal strategies are generally associated with decreased rates of suicide. However, trends in background rates of suicide need to be considered in the design of evaluations in order to tease out whether or not the intervention has had a demonstrable impact on suicide rates. This review highlighted the important finding that universal prevention activities, particularly those using regulatory approaches, seem to benefit populations where selective and indicated initiatives do not such as men and young people (Ishimo et al., 2021).

Periods of economic downturn and recessions also appear to be associated with increased rates of suicide in high- and low-income countries and provide a focus for universal interventions (Haw, Hawton, Gunnell, & Platt, 2015), with the COVID-19 pandemic reigniting interest in this area e.g., (Gunnell et al., 2020). For every 1% increase in unemployment there is around a 1% increase in deaths by suicide (Shand et al., 2021). The effect of recession is particularly evident on the male suicide rate and among those with lower levels of educational qualification (Haw et al., 2015). A selected review by Haw and colleagues suggests that enhancing rather than reducing economic and welfare support in periods of recession, enhancing access to mental health services, supporting opportunities for social support, and reducing alcohol consumption, particularly binge drinking, may be

effective for reducing suicide (Haw et al., 2015). Similarly, a recent narrative review of social protection policies found that 16 of 19 studies showed evidence of a protective effect against suicide of increased expenditure as a proportion of GDP with strategies including unemployment benefits, active support of return to labour market programmes and social welfare (Kim, 2018). A recent review also highlights that unemployment benefits alone do not necessarily protect against suicide for those experiencing unemployment. It is important to have active labour market policies which may include activities such as assistance with job searching, welfare to work schemes, practical training for skills-shortage occupations, and youth focused vocational training alongside robust employment protection legislation, particularly for men (Shand et al., 2021).

### *Media reporting guidelines*

There is longstanding concern about the potential for both non-fiction and fictional portrayal of suicide to result in copy-cat behaviour. More recent scientific literature suggests that such portrayal may also have the potential to contribute to suicide prevention (e.g. Niederkrotenthaler et al., 2010). The theoretical models for how exposure to certain types of media representations of suicide lead to suicidal behaviour are based on the concept of contagion or imitation (Cheng, Li, Silenzio, & Caine, 2014), whereby the exposure to media representations of suicide or self-harm is one of a number of multiple, and possibly inter-linked, causal pathways that may contribute to a suicide death (e.g. Beautrais, 2000). More specifically, media exposure of suicide is thought to influence suicide rates in two ways; the first is to increase familiarity with the concept of suicide, giving the community a sense that suicide is ‘all around’ them, and is a reasonable response to adverse life events. This may decrease the social taboo against suicide, a taboo which is thought to be protective (Hawton & Williams, 2002). Secondly, media portrayals may provide specific information about certain methods or means of suicide and may lead to direct ‘copycat’ or imitation behaviour among vulnerable people (Pirkis, Blood, Sutherland, & Currier, 2019a).

Because of these known associations between media reporting and suicide deaths, media reporting guidelines for suicide prevention focus on the use of strategies to reduce the potential for imitation and contagion following publicised suicides (Stack, 2020). Changes in media reporting of suicide deaths are likely to have a preventative effect on suicide deaths (Barker, Kolves, & De Leo, 2017; Bennett et al., 2015; Cox et al., 2013; Cox et al., 2012; Gunnell et al., 2020; Haw et al., 2015). Adherence to media reporting guidelines differs

country to country, perhaps due to variations in awareness and buy-in among media outlets. There have been several attempts to establish responsible reporting guidelines in New Zealand over the past two decades with mixed success. On one hand changes to the Coroners Act which gave media greater ability to report on suspected self-inflicted deaths did not lead to any significant changes in frequency of reporting in the short term (Collings, Slim, Stanley, & Jenkin, 2018). On the other hand, there are regular and repeated examples of local media coverage which does not comply with guidelines. A recently published New Zealand study highlighted discrepant opinions between stakeholders on this matter, particularly around coverage of suicide as a public health issue and coverage of specific, individual suicide deaths (Jenkin, Slim, & Collings, 2020). As with most best practice guidelines, responsible reporting practices appear most likely to be adopted following a model of consultation, collaboration, media ownership, and sustained training (Bohanna & Wang, 2012).

#### *Synthesis and implications for Aotearoa*

Adoption of safe media reporting practices have a preventative effect on suicide deaths (Barker et al., 2017; Bennett et al., 2015; Cox et al., 2013; Cox et al., 2012; Gunnell et al., 2020; Haw et al., 2015). However, the effectiveness of responsible media reporting guidelines depends on adherence by media outlets. In Aotearoa New Zealand the next phase of this work is to enhance adherence and then evaluate the recently refreshed guidelines. There is also a need for local research on the impact of media coverage on subsequent suicide rates, particularly coverage of deaths by high profile community members.

#### *Mass media campaigns*

Mass media campaigns are an important aspect of suicide prevention, and are separated, although overlap, with considerations around safe media reporting of suicide. Mass media campaigns that aim to enhance knowledge and attitudes about suicide prevention and decrease stigma towards those experiencing suicidal distress can be delivered either as a stand-alone intervention, or as part of a multilevel approach to prevention. The most prominent and recent review in this area (Torok, Callear, Shand, & Christensen, 2017), found mixed results with some campaigns having no or only very modest effects on literacy about suicide prevention, approximately one in three studies showing an effect on suicide attempts or deaths by suicide, and only half of the interventions targeting stigma were effective in

reducing it. However, these authors suggested that standalone mass media campaigns are less effective than those embedded in multilevel interventions and sustained, repeated and multichannel campaigns appeared to result in more sustained change (Torok et al., 2017).

### *Synthesis and implications for Aotearoa*

Mass media suicide prevention campaigns are most likely to be effective when embedded in multilevel interventions. They need to be sustained, repeated, and multichannel focusing on building mental health literacy, reducing stigma, and tailored to different communities of interest (Niederkröthaler et al., 2010; Pirkis et al., 2019b; Torok, Calear, Smart, Nicolopoulos, & Wong, 2019). New Zealand has a strong, and internationally recognised, tradition of anti-stigma mass media campaigns in the broader area of mental health (Thornicroft et al., 2016), however we to further develop expertise in evaluated suicide prevention campaigns.

### *Restricting access to jumping locations*

Restricting access to locations associated with suicide, sometimes known as ‘hot spots’ is the subject of several included reviews (Cox et al., 2013; Okolie et al., 2020b; Pirkis et al., 2013; Pirkis et al., 2015). Jumping locations such as bridges, buildings, natural beauty spots and railways are most widely researched. Intervention approaches commonly involve one or more of the following strategies the installation of physical barriers of various heights or reduced access, such as railway platform screen doors and barriers or suicide pits (which reduce the probability of fatal injury should a person be on the tracks when a train passes) (Altavini, Ascitti, Solis, & Wang, 2022; Barker et al., 2017; Cox et al., 2013; Havarneanu, Burkhardt, & Paran, 2015; Okolie et al., 2020b; Pirkis et al., 2013), supporting help-seeking by placement of signage and/or telephones, increasing the chances of intervention through use of surveillance and/or staff training, guidelines for responsible reporting of locations associated with suicide (Cox et al., 2013; Pirkis et al., 2013; Pirkis et al., 2015) and the use of blue light (Barker et al., 2017; Pirkis et al., 2015). There is strong evidence that reducing access to certain locations is associated with reduced suicides by jumping (Cox et al., 2013), despite some substitution to nearby sites (Pirkis et al., 2013). For example, one review found an 86% reduction in jumping suicides per year at intervention sites (95% CI 79% - 91%), with a 44% increase in jumping suicides per year at nearby sites (95% CI 15% - 81%) and an overall 28% reduction in suicides by jumping per year (95% CI 13% to 40%) (Pirkis et al.,

2013). This finding was further refined in a subsequent review by the same research group which showed that interventions restricting access to means were associated with a reduction in the number of suicides per year (incidence rate ratio 0.09, 95% CI 0.03–0.27;  $p < 0.0001$ ), with promising evidence of effectiveness for interventions that encourage help-seeking (0.49, 95% CI 0.29–0.83;  $p = 0.0086$ ), and interventions that increase the likelihood of intervention by a third party (0.53, 95% CI 0.31–0.89;  $p = 0.0155$ ). It can also be effective to have either restricting access to means or location alone (0.07, 95% CI 0.02–0.19;  $p < 0.0001$ ), or encouraging help-seeking at these locations (0.39, 95% CI 0.19–0.80;  $p = 0.0101$ ) if the introduction of barriers is not possible (Pirkis et al., 2015). A more recent Cochrane review further consolidates the previous findings and suggested that use of physical barriers, fencing, safety nets or restriction of access to these sites was associated with a 91% reduction in suicides at these locations (Okolie et al., 2020b).

In addition to the classic studies conducted in New Zealand showing the effectiveness of restricting access to two jumping locations (Beautrais, Gibb, Fergusson, Horwood, & Larkin, 2009; Skegg & Herbison, 2009), which are incorporated into the reviews above, there is a less well-known study conducted in Auckland showing that fencing reduced trespass on railways, and was more effective than education to school students whose school was adjacent to the railway location which is incorporated into the review of railway prevention strategies (Havarneanu et al., 2015). There is also continued research on the effectiveness of surveillance systems and staff training to reduce trespassing, act as gatekeepers and train technology to assist rapid stopping (Havarneanu et al., 2015).

### *Synthesis and implications for Aotearoa*

Restricting access to locations associated with suicide reduces suicide. The installation of physical barriers, placing signage and telephones to support help-seeking, using blue lights, increasing the chances of intervention through use of surveillance and/or staff training, updated technology for faster stopping of trains, and guidelines for responsible reporting of locations associated with suicide are all important approaches to prevent suicide in Aotearoa New Zealand. The expansion of the rail network, such as Auckland's light rail should incorporate these strategies at the design stage and any emergent locations should be actively considered for retro-fitting.

### *Restriction of other means of suicide*

Ease of access to certain means and substances used as methods of suicide are commonly associated with increased rates of suicides, and present key opportunities for prevention. These include restriction of gun ownership, pesticides, carbon monoxide gas, paracetamol, opioids, alcohol, and the modification of specific settings to reduce ease of hanging, and modifications to road networks outlined below.

*Gun ownership* is associated with increased rates of suicide overall, as well as death by suicide using a firearm (Jin, Khazem, & Anestis, 2016; Mann & Michel, 2016) and non-suicide related firearm mortality among children (Zeoli et al., 2019). Like other approaches to means restriction, reducing suicide deaths by firearms requires multiple strategies including the use of locked gun cabinets, storing guns unloaded, separate storage of guns and ammunition and outside of the USA, a focus on more stringent licencing. Changes to licencing in New Zealand after the 1990 Aramoana tragedy reduced firearm suicides, particularly among young people (Beautrais, Fergusson, & Horwood, 2006; Mann & Michel, 2016). Most firearms deaths in New Zealand occurring among older men, who have lower than average rates of GP contacts and antidepressant prescriptions in the year prior to their death (see the Suicide Mortality Review Committee report [here](#) for more detail). The impact of more recent firearms amendments following the 2019 Christchurch tragedy (Every-Palmer, Cunningham, Jenkins, & Bell, 2021) is not yet clear, but needs to be evaluated from a suicide prevention perspective.

Lethal means counselling usually focuses on firearms or medication advice and on parents taking care of a suicidal young person. Studies to date have focused on those presenting to Emergency Departments (ED's) and have identified clinician hesitancy, perceived lack of skill and clinician scepticism about effectiveness as barriers to routine delivery of this approach to suicide prevention (Hunter et al., 2021).

*Ingestion of pesticides* is a method of suicide associated with a number of agricultural communities and in low and low middle income countries (LMIC) particularly in the Western Pacific region (Mew et al., 2017). Consideration of pesticide ingestion as a method of suicide is becoming more relevant to prevention in New Zealand as we become more diverse as a nation. The evidence to date suggests that national bans, rather than safe storage (Reifels et al., 2019) or sales restrictions (Gunnell et al., 2017) of the most highly hazardous pesticides (HHP) is the most effective method of reducing deaths both by suicide and overall, without

impacting agricultural outputs (Bonvoisin, Utyasheva, Knipe, Gunnell, & Eddleston, 2020; Gunnell et al., 2017; Mew et al., 2017).

Means restriction to *carbon monoxide gas* has been the focus of a number of studies in the UK following changes in supply source for domestic gas (Sarchiapone, Mandelli, Iosue, Andrisano, & Roy, 2011). In New Zealand there has been a positive impact of regulations for catalytic convertors in motor vehicles (Suicide Mortality Review Committee, 2016), against a backdrop of reduced deaths (intentional and unintentional) due to carbon monoxide poisoning in Australasia (Long, Sun, Zhao, Liu, & Peng, 2021). Deaths by this method may further decline as the proportion of petrol vehicles in the fleet decreases over time.

*Paracetamol* is a cheap, widely available compound which is commonly used in intentional self-poisoning and is associated with morbidity and mortality. Paracetamol controls, reducing both the number of tablets available in a package, and number of packs that can be purchased at once have been effective in reducing deaths associated with this method in the UK (Hawton et al., 2013) and Ireland. However, both countries report ongoing issues with paracetamol overdoses and researchers recommend further reductions in availability such as making this a pharmacy only medication (Casey et al., 2020; Daly et al., 2021). Paracetamol control in Scotland had some initial success following the introduction of pack size controls, but then returned to previous levels (Gorman, Bain, Inglis, Murphy, & Bateman, 2007). A number of Australian states have moved to implement paracetamol control based on the international evidence (Lim, Buckley, Chitty, Moles, & Cairns, 2021). In addition to paracetamol, interventions to reduce access to salicylates, dextropropoxyphene, barbiturates, and caffeine tablets have also been found to effective across a number of countries (Lim et al., 2021).

*Hanging* has an extremely high case fatality rate and is the most common method of suicide among every population group in Aotearoa New Zealand, which makes this an important aspect of prevention to consider. In general population settings reducing access to ligatures and ligature points is not entirely feasible. However there is still scope for a reduction in deaths by this method in institutional settings such as hospitals, prisons and police custody using design for safety principles, ensuring adequate staffing and service user visibility (Jin et al., 2016; Sakinofsky, 2014). Internationally, certain common ligature points have been targeted for re-design to ensure they collapse under weight. There may be scope for this in New Zealand also, given that most deaths by hanging occur in the home. In addition,



reducing unsafe reporting or social media content about this method is an important approach to reducing cognitive valence of this method (Cai, Junus, Chang, & Yip, 2022).

*Alcohol* consumption is associated with elevated risk of suicide, at both an individual and population level. Both acute intoxication and alcohol misuse are potential targets for intervention given their association with low mood, loss of behaviour regulation and hopelessness (Norstrom & Rossow, 2016). Reducing access to alcohol, and increasing price are feasible and effective strategies for reducing alcohol related harm generally, and for reducing suicide in particular (Altavini et al., 2022), particularly among men and younger people (Kolves et al., 2020). Reducing access has been shown to be effective in Europe and North America, including with indigenous populations (Leske et al., 2020). The clinical treatment literature relating to alcohol is addressed in a later section.

In terms of roading, New Zealand has a large *road network*, and each year there are transport-related suicides in which the deceased may be a driver or pedestrian. International evidence suggests that a proportion of transport accidents are suicides and suicide should be considered particularly in single vehicle accidents, for men 25 to 35 years and where the person has a prior experience of suicide attempt (Okolie et al., 2020a). There has been relatively little work in this area in New Zealand (Fortune, McDonald, Chafer, Lilley, & Mulder, 2022) and a recent review was unable to identify any intervention studies (Okolie et al., 2020a).

There has been extensive coverage in both the mainstream media and academic publications on the impact on opioid prescribing on *opioid related deaths*, particularly in the USA. Opioids are of interest to suicide prevention practitioners in New Zealand. First, we already have intentional self-poisoning deaths due to opioid compounds particularly among older men (Fortune et al., 2022). Secondly, there is a known overlap between accidental and intentional self-poisoning deaths internationally, and thirdly, there has been recent media coverage suggesting that compounds such as fentanyl are being distributed in the community (see [here](#) for more details). A full consideration of this topic is beyond the scope of this review; however, it is likely a strong prescription drug monitoring system (in terms of dose, duration and frequency), patient and clinician education, (Ansari, Tote, Rosenberg, & Martin, 2020) (e.g., Beaudoin, Banerjee, & Mello, 2016) in addition to harm reduction measures such as the availability of naloxone is likely to be needed. The evidence for the latter is; however, mixed (e.g., (Ansari et al., 2020)).

## *Synthesis and implications for Aotearoa*

The restriction of lethal means is an important approach to suicide prevention, with a strong evidence base, and has also been highlighted as a key component in effective multilevel approaches (Hofstra et al., 2020; Krysiniska et al., 2016; Mann & Michel, 2016). Increasing the unit price and reducing the accessibility of alcohol is likely to have positive effect in Aotearoa (Altavini et al., 2022), especially among younger people and men (Kolves et al., 2020). National bans of pesticides may be an important next step in reducing suicide rates in a growing Asian population (Bonvoisin et al., 2020; Gunnell et al., 2017; Mew et al., 2017; Reifels et al., 2019). Ensuring adequate staffing, service user visibility, and designing for safety is likely to reduce suicide by hanging in clinical and judicial settings (Jin et al., 2016; Sakinofsky, 2014), this is further addressed in the section of this report on inpatient and prison settings. There is scope in Aotearoa to re-design common ligature points to collapse under weight to reduce hanging in the home, and to increase adherence to responsible reporting guidelines and reductions in social media content (Cai et al., 2022) and for strategies to address access to a range of medications including paracetamol.

## **2. Level of intervention: Selective**

### *Risk assessment*

The challenges of conducting suicide risk assessment in contemporary Aotearoa New Zealand are documented in a recent publication (Fortune & Hetrick, 2022b) and follows from the important observation that “*the idea of risk assessment as risk prediction is a fallacy and should be recognised as such*” (Chan et al., 2016, p.282). We identified a number of reviews reporting on a range of scales and checklists available for risk assessments of those who are suicidal, in various settings such as General Practice (Abarca, Gheza, Coda, & Elicer, 2018), prisons (Gould, McGeorge, & Slade, 2018), children and adolescents (Carter, Walker, Aubeeluck, & Manning, 2019; Harris, Beese, & Moore, 2019), young people with autism (Howe, Hewitt, Baraskewich, Cassidy, & McMorris, 2020), adolescents presenting to the emergency department (Cervantes et al., 2021), NSSI by adolescents (Chavez-Flores, Hidalgo-Rasmussen, & Yanez-Penunuri, 2019), adolescents in school settings using e-health (Exner-Cortens et al., 2021), adults (Kreuzer & Lamis, 2018), veterans (Nelson et al., 2017), and mental health services (Bolton, Gunnell, & Turecki, 2015). However, it is important to recognise that despite the proliferation of these measures, we still have limited ability to predict who will engage in self-harm or die by suicide (Carter et al., 2017; Chan et al., 2016;

Franklin et al., 2017; Large et al., 2018; Quinlivan et al., 2016; Ribeiro et al., 2016; Runeson et al., 2017; Woodford et al., 2019). For example, even among mental health service users, who have a relatively high rate of death by suicide, the positive predictive value (PPV) of risk assessment measures is low, ranging from 5.5% (95% confidence interval, CI = [3.9, 7.9]) for suicide to 26.3% (95% CI = [21.8, 31.3]) for self-harm and 35.9% (95% CI = [25.8, 47.4]) for self-harm plus suicide (Carter et al., 2017).

The evidence suggests relatively modest differences between unassisted clinician prediction (Woodford et al., 2019), approaches that focus solely on the presence of suicidal ideation (Erford, Jackson, Bardhoshi, Duncan, & Atalay, 2018; McHugh, Corderoy, Ryan, Hickie, & Large, 2019) and the use of technological solutions which employ algorithms or machine learning (Belsher et al., 2019; McHugh & Large, 2020). A thorough review of suicide prediction using machine learning concludes “*the meta-analyses of sensitivity and specificity suggests that under half of all suicides might be anticipated by suicide prediction models, with non-suicide being incorrectly predicted in more than one in ten cases. Meta-analyses of a subsample of cohort studies suggested that 34 in 35 suicide predictions are likely to be false positive predictions*” (Corke, Mullin, Angel-Scott, Xia, & Large, 2020, p.6).

*Suicide risk stratification*, or classifying a person as being at low, medium or high risk of suicide based on these risk assessment tools or measures, continues to be used to decide who should, or should not, get access to treatment, despite best practice guidelines from local (Carter et al., 2016) and international professional organisations (NICE, 2022). Given the poor performance of risk assessment approaches, many people are misclassified and may either receive treatments they don't need or are unable to access to treatments that would potentially be helpful (Carter et al., 2017). The latter is of particular concern for those categorised as being at low risk of suicide who as a consequence do not get timely access to treatments that would reduce exposure to factors associated with self-harm and suicide such as depression, anxiety, posttraumatic stress disorder (PTSD) and substance misuse. There is also an iatrogenic effect of a person being labelled ‘low risk’ having reached out for help; this is extremely invalidating and potentially prevents future help-seeking (Bellairs-Walsh et al., 2021).

Clinicians do not always feel confident in conducting suicide risk assessments (Airey & Iqbal, 2020), with varying (and sometimes low) rates of administering suicide risk screens (Cervantes et al., 2021). They may be subject to conflicting practice advice (Bernert, Hom,

& Roberts, 2014) despite evidence that there is no harm in asking about suicidal behaviour (Polihronis, Cloutier, Kaur, Skinner, & Cappelli, 2020). These challenges enhance interest in emerging alternative approaches to risk assessment, such as the use of big data integrating information from electronic medical records, the world wide web (D'Hotman & Loh, 2020) and administrative data sets (Bernert et al., 2020; Kessler, Bossarte, Luedtke, Zaslavsky, & Zubizarreta, 2020). Ecological momentary assessment (EMA), electronic monitoring and the use of natural language processing applied to the content of clinical records and social media are also developing (Berman & Carter, 2020b; Castillo-Sanchez et al., 2020; Fonseka, Bhat, & Kennedy, 2019; Kessler et al., 2020). However, there are ethical and practical constraints to these approaches in New Zealand, including the extent to which they align with Te Tiriti O Waitangi and Māori data sovereignty principles (Kukutai & Cormack, 2019). Furthermore, the same issues regarding the poor predictive ability of these more recent approaches remain (Berman & Carter, 2020a; Bernert et al., 2020; Burke, Ammerman, & Jacobucci, 2019). In addition to the technical issues identified above, there are also organisational, service user acceptability, perceptions about liability, and staff training needs which influence the utilisation of suicide risk assessments (e.g., Cervantes et al., 2021).

### *Synthesis and implications for Aotearoa*

There are numerous risk assessment tools, and associated risk stratification templates, that attempt to make accurate prediction about the likelihood of future suicidal behaviour. However, there is significant scientific evidence and several best practice guidelines that caution strongly against using this approach, particularly when making decisions about who can access treatment. The reliance on suicide risk assessment and prediction within clinical services needs to be actively reviewed.

### *Gatekeeper training*

The term gatekeeper is used to describe individuals (including those in professional settings such as healthcare or education; and those in lay-person roles such as family or friends) who may have contact with individuals experiencing suicidal distress. Gatekeeper training programmes aim to provide these individuals with knowledge, skills and strategies to better recognise and inquire about suicidal behaviour and to intervene appropriately.

The evidence for gatekeeper training is mixed (Ferguson et al., 2020; Holmes, Clacy, Hermens, & Lagopoulos, 2021; Yonemoto, Kawashima, Endo, & Yamada, 2019). However

this approach can be considered a valid method of improving the immediate knowledge, skills and self-efficacy of gatekeepers (Bowersox, Jagusch, Garlick, Chen, & Pfeiffer, 2021). This approach has been reviewed for gatekeeper training of peers; (Ferguson et al., 2020; Ferguson et al., 2018), nurses and nursing students (Herron, Patterson, Nugent, & Troyer, 2016), small non-urban communities (Holmes et al., 2021), school-based gatekeepers (Nasir et al., 2016), teachers and parents (Mo, Ko, & Xin, 2018) and indigenous community members (Torok et al., 2019),

Positive changes in knowledge were maintained over short timeframes of 4 - 6 months post training in reviews of nurses and those supporting older adults (Ferguson et al., 2020; Holmes et al., 2021). Additional elements may be required in gatekeeper training interventions to support long-term and sustained positive changes (Holmes et al., 2021; Mo et al., 2018). It is also important to recognise that short-term improvements in knowledge and self-efficacy of gatekeepers are not always sufficient to increase the identification of suicide behaviours, both immediately following training and over longer time periods (Holmes et al., 2021; Torok et al., 2019). The sociocultural context in which gatekeeper training is implemented needs to be understood to inform interventions focused on creating enduring attitudinal change (Bowersox et al., 2021; Ferguson et al., 2020; Holmes et al., 2021; Nasir et al., 2016). It seems likely that compassion fatigue (Holmes et al., 2021), stigma and poor attitudes towards suicide (Holmes et al., 2021) both among the public and among health professionals needs to be factored into effective programmes. Consideration should also be given to the wellbeing and suicide outcomes for the gatekeepers themselves (Ferguson et al., 2020; Morton et al., 2021).

Key authors in this area suggest there are a limited number of gatekeeper interventions targeting the lay public, who are much more likely to be contacted by those experiencing suicidal distress compared with professionals (Hill, Somerset, Armstrong, Schwarzer, & Chan, 2021) or friends and family caring for a person with lived or living experience of suicidal distress (Morton et al., 2021). To date there has also been relatively little consideration of culturally appropriate gatekeeper training programmes for indigenous peoples (Nasir et al., 2016).

### *Synthesis and implications for Aotearoa*

Gatekeeper training is a core element in a large number of suicide prevention programmes, and has been delivered as both a single intervention and is a feature of most multi-level or multi-component interventions. However, it is important to note that the evidence for gatekeeper training is mixed; this approach may be a valid method of improving the immediate knowledge and self-efficacy of gatekeepers; however, there is relatively little, high-quality evidence of the impact of these programmes on helping behaviour or on suicidal behaviour. It is important to recognise that improvements in knowledge and confidence decay relatively quickly and that additional strategies are likely needed to consolidate gains, not just repeated delivery of the same core intervention. It is important that those purchasing or attending gatekeeper training have clear expectations of what this approach can achieve and acknowledge that providing communities with knowledge may well be a valid and important approach to increasing confidence and reducing anxiety.

We have active gatekeeper training activities, at least some of which have been designed and developed with cultural responsiveness and the suicide prevention context of Aotearoa New Zealand as central. The next steps is to develop a robust evaluation methodology to develop a greater understanding of their impact on behaviour change outcomes, over short and longer periods of time (Ferguson et al., 2018). This will also support understanding of the costs and time spent training relative to a programme's effectiveness (Herron et al., 2016).

### *Peer and social support*

Peer support may be used to deliver suicide prevention through a range of approaches including the provision of planned supports, acute crisis supports in a range of health and non-health settings. Peers can include those with shared experience, fellow laypersons or members of the same community of interest. This is a relatively new area and to date there is insufficient evidence of the effectiveness of peer-based interventions for suicide prevention in the published literature. Most literature identified by reviews were programme descriptions with only a small number of uncontrolled studies (Bowersox et al., 2021; Schlichthorst, Ozols, Reifels, & Morgan, 2020). However, this is an area where there is a great deal of community-based activity and the research literature may well be lagging in terms of describing effective interventions.

One of the challenges from a research perspective is there is inconsistency in the operationalisation and measurement of peer support interventions. However, Kryszynska et al., (2021) conducted a narrative review of psychosocial interventions for those supporting individuals who survived a suicide attempt. Suicide related outcomes were not examined; but carers reported improved mental health outcomes, lower burden and improved ability to care. Kia et al., (2020) conducted a scoping review of peer support models for trans populations suggesting they provided a protective effect against suicide.

Evidence from a robust meta-analysis examining social support interventions, defined broadly as including one-to-one interventions (face-to-face meetings, text messaging, telephone or email) and group interventions (therapy, social gatherings, hiking, volunteer services) for populations deemed at risk of suicide concluded that the face-to-face interventions (i.e., those with direct contact and were interactive), but not group interventions, significantly reduced the number of suicides, but not the number of suicide attempts (Hou et al., 2021). Sullivan et al., (2021a) conducted a scoping review of a range of group-based treatments, thought to enhance social support and decrease isolation due to delivery in a group setting. They suggested this modality was acceptable to most participants and had positive impacts on suicidal behaviour.

#### *Synthesis and implications for Aotearoa*

The use of social support and peer support interventions is relatively under-researched in terms of efficacy and there is need for high quality research to evaluate these interventions (Bowersox et al., 2021; Hou et al., 2021; Kia, MacKinnon, Abramovich, & Bonato, 2021; Schlichthorst et al., 2020). Enhancing support and connection are key elements of the next generation of suicide prevention interventions. The use of peer and social support recognises the complexity of suicide, and broadens the range of interventions available beyond a health focus. There are a number of service innovations locally and internationally that are of interest in this area. To maximise success of this approach in Aotearoa New Zealand key factors for considerations are the models of peer support required for safe practice, the recognition of lived experience as valuable expertise and the equity of compensation across different parts of the suicide prevention workforce.

### *Surveillance of behaviour using video/CCTV*

A comprehensive narrative review provides an overview of the variety of ways video and/or CCTV are currently being used, or developed for use, in suicide prevention (Onie, Li, Liang, Sowmya, & Larsen, 2021). Three applications of video or CCTV surveillance were identified; visual identification of risk factors (e.g., depression from facial features), forensic applications to aid understanding after a suicide attempt, and identification of behavioural clues prior to an attempt that may provide opportunity for intervention. This review suggested that manual CCTV monitoring may reduce incidences of suicide in some settings such as in hospitals or public spaces such as train stations. Automated detection systems are being developed to identify behaviours associated with a suicide attempt. This is another relatively new area and evaluations of effectiveness have not been completed (Onie et al., 2021).

### *Surveillance of online behaviour*

The reliability and preventative capacity to screening online behaviour in order to identify suicide risk and monitor patterns of web activity for suicidal behaviours has not yet been determined (Christensen, Batterham, & O'Dea, 2014; Lopez-Castroman et al., 2020). Interventions triggered by the screening of online activity and delivered via social media are possible; however, the validity, feasibility, effectiveness and implementation of this approach remains highly uncertain (Christensen et al., 2014; Lopez-Castroman et al., 2020). One approach is the use of Embodied Conversational Agents (ECAs) which are computational interactive interfaces potentially useful in detecting suicide-related risk (Martinez-Miranda, 2017). The ECA 'interviews' a user using pre-defined questions and information elicited is used by the ECA to provide immediate feedback. Where concerns are detected the ECA may promote face-to-face contact with a clinician or caregiver. Research is needed to establish whether screening of online suicide-related behaviours is an effective method to reduce suicide related outcomes and what preventative measures should best be applied where risky situations are detected (Christensen et al., 2014; Lopez-Castroman et al., 2020).

### *Synthesis and implications for Aotearoa*

The use of surveillance approaches to human behaviour both in person and online is an area of significant interest and activity. To date there is little clear evidence of effectiveness. This approach faces the same challenges of predicting a relatively rare event that clinical suicide risk assessment faces. It is also important to note that the role of surveillance raises



significant issues in terms of privacy, autonomy and Māori data sovereignty and that key players in the online environment are not based in Aoteroa New Zealand.

### **3. Level of intervention: Indicated**

#### *Psychological Therapy's*

Psychological approaches used to treat those who engage in suicidal behaviour typically involve brief individual or group interventions based on Cognitive Behavioural Therapy (CBT), Dialectical Behaviour Therapy (DBT), Mentalisation-Based therapy, Emotion-Regulation psychotherapy, Psychodynamic psychotherapy, and problem-solving therapies. There are a number of reviews for self-harm (Hetrick, Robinson, Spittal, & Carter, 2016; Witt et al., 2021a) for suicide attempt; (Meerwijk et al., 2016; Sobanski, Jospheld, Peikert, & Wagner, 2021); and for suicidal ideation (Krysinska, Batterham, & Christensen, 2017).

Interventions may be multimodal in nature including various levels of case management and remote contact interventions. Psychological therapy approaches may vary in terms of location of treatment, continuity, intensity and frequency of contact with a therapist (Winter, Bradshaw, Bunn, & Wellsted, 2013; Yiu, Rowe, & Wood, 2021). Some psychological interventions that take a direct approach to addressing suicidal thoughts and behaviours and others work indirectly with these outcomes by addressing hopelessness, depression or anxiety. A systematic review and meta-analysis including participants of all ages, found that interventions which address suicidal thoughts and behaviours directly are advisable as they have positive effects immediately after completion of treatment and also in the longer term, whereas indirect approaches are effective in the longer term, missing the opportunity for initial gain (Meerwijk et al., 2016).

Overall, DBT and CBT are the most widely evaluated psychological interventions and show some potential, for some populations (Hetrick et al., 2016; Hurzeler et al., 2021; Krysinska et al., 2017; Mendez-Bustos et al., 2019; Sobanski et al., 2021; Witt et al., 2021a; Witt et al., 2021c; Yiu et al., 2021), but may not be effective in some settings (e.g., inpatient, see Yiu et al., 2021) or for some populations (e.g., elderly, see Zeppegno, Gattoni, Mastrangelo, Gramaglia, & Sarchiapone, 2019).

Psychological interventions for suicidal ideation were investigated with a focus on gender differences and concluded that treatment outcomes were either similar across males and females, and some favoured females in terms of reduced suicidal ideation. Factors such as

severity of suicidal thoughts, behaviours, and adherence to treatment may have a greater impact on treatment outcomes than gender (Krysinska et al., 2017).

The following section focuses on adults, with youth considered in a subsequent section.

### *Cognitive behaviour therapy (CBT)*

CBT is a well-established therapeutic approach. The recent Cochrane Review identified 21 trials of CBT for adults who experienced self-harm, with most trials evaluating the effectiveness of this intervention of up to 10 sessions, over a three-month period, offered individually (n=20). Only four trials reported repetition of SH after treatment as a primary outcome, these data suggest reduced repetition of SH, with this effect more evident at longer follow-up periods. There was no evidence of an effect of CBT-based therapies on the frequency of SH or time to repetition of SH in this review. CBT was also associated with a small, but beneficial effect on depression, hopelessness, and suicidal ideation, but not suicide (Witt et al., 2021c).

### *Dialectical behaviour therapy (DBT)*

There is mixed evidence for the effectiveness of DBT. Most studies of DBT have been conducted with participants meeting criteria for Borderline Personality Disorder and identify as female, which makes the generalisability of these findings to other populations difficult. One review, with meta-analysis including both RCT's and CCT's, of Dialectical behaviour therapy (DBT) in mixed populations, reported a reduction in self-directed violence ( $d = -.324$ , 95% CI =  $-.471$  to  $-.176$ ), but not suicidal ideation ( $d = -.229$ , 95% CI =  $-.473$  to  $.016$ ). The authors suggested the lack of effect on suicidal ideation reflects the focus of DBT on behaviour rather than cognition (DeCou, Comtois, & Landes, 2019). A more recent review restricted to RCT's of DBT in adults (18+ years), found no evidence of effect of DBT on suicide reattempts (Sobanski et al., 2021). In what should be considered the gold standard review, due to its robust methodology, the authors of a recently updated Cochrane Systematic conclude "*there was no evidence of an effect for standard DBT compared to either TAU or alternative psychotherapy in terms of the proportion of patients repeating SH by the post-intervention assessment (OR 0.71, 95% CI 0.32 to 1.55; participants = 502; studies = 6;  $I^2 = 60%$ )*" (Witt et al., 2021c, p.40). There was also no evidence of an effect on treatment adherence, suicidal ideation or suicide or for significant differences in outcome for group, individual or prolonged exposure versions of DBT (Witt et al., 2021c).

### *Mentalisation based interventions*

Mentalisation is defined as the ability to understand the your own and other people's behaviour with reference to motivational and emotional states. Mentalisation-based therapy approaches help people identify and understand their emotions, to facilitate the development of strategies they can use in times of stress to regulate their emotions and reduce the probability of self-harm. The Cochrane Review of interventions for adults, identified a single trial in which mentalisation-based therapy reduced repetition of SH and the frequency of SH (OR 0.35, 95% CI 0.17 to 0.73) (Witt et al., 2021c).

### *Mindfulness based interventions*

Mindfulness based interventions (MBI) have attracted much public attention; two reviews, spanning mixed populations, including with a heterogenous range of mindfulness-based interventions, and studies of varying (often low) quality suggesting MBI may reduce suicidal thoughts or behaviour, particularly in populations with mood related disorders (de Aguiar et al., 2021; Raj, Ghosh, Verma, & Singh, 2021). However, robust metanalytic approaches to this intervention are lacking, and a number of MBI studies did not meet the inclusion criteria of the recent Cochrane Systematic Review. It is also important to note that this approach, may not be suitable for everyone, with a recent review highlighting adverse events including anxiety, depression and suicidal behaviour in studies investigating meditation and mindfulness-based interventions (Farias, Maraldi, Wallenkampf, & Lucchetti, 2020). Further high quality trials with suicide specific outcomes are required before firm conclusions regarding suicide prevention can be drawn (Schmelefske, Per, Khoury, & Heath, 2020).

### *Case Management*

Case management is a generally accepted cornerstone of good practice in supporting those who are experiencing suicidal distress. Case management may involve identifying the support or treatment needs with a person, developing a care plan and facilitating communication and coordination of care. However, a metaanalysis of 5 RCT's with n= 1,608 participants reported no clear evidence of an effect of case management compared with treatment as usual or enhanced usual care on self-harm at the completion of the intervention or time to repetition of self-harm (Witt et al., 2021c).

### *Summary and implications for Aotearoa New Zealand*

Adults who experience suicidal behaviour should be able to access effective psychological therapies. The evidence presented above indicates that CBT and mentalisation-based therapies may benefit some participants. Despite strong brand awareness, it is not entirely clear that DBT reduces absolute repetition of self-harm, and there is likely to be little or no effect of DBT group or individual or group skills training on repetition among adults (Witt et al., 2021c).

### *eHealth approaches for those experiencing suicidal distress*

eHealth suicide prevention interventions cover a broad range of modalities and applications, including suicide prevention interventions using digital platforms, telehealth services, self-management mobile applications (apps) and websites. The evidence for these is outlined below.

### *Digital apps and websites*

Digital interventions offer unique advantages such as increased availability and scalability, reduced stigma and the potential to address barriers to face-to-face help (Yu et al., 2021). The use of digital apps has been explored for use independently, or as an adjunct to face-to-face interventions (Melia et al., 2020). There are few definitive conclusions about effectiveness (Lai, Maniam, Chan, & Ravindran, 2014; Rojas, Carter, McGinn, & Reger, 2020; Szlyk & Tan, 2020) although promising findings have been reported (Arshad et al., 2020; Buscher, Torok, Terhorst, & Sander, 2020; Chen & Chan, 2020; Melia et al., 2020; Stefanopoulou et al., 2020; Yu et al., 2021).

A recent meta-analysis investigating the efficacy of a diverse range of mobile phone and internet-based psychological interventions for suicidal behaviour among adolescents and adults found a positive treatment effect on suicidal ideation when compared with usual care, but not when compared with active control interventions (Arshad et al., 2020). Similarly, online delivery of Cognitive Behavioural Therapy (CBT), Mindfulness-Based Cognitive Therapy (MBCT), and Dialectical Behavioural Therapy (DBT) showed promising results among adults 18-65 years (Stefanopoulou et al., 2020). Short-term improvements in suicidal ideation have been reported at 3 month follow-up for iCBT for adults (Yu et al., 2021) and also for slightly longer follow-up periods in both adolescents and adults (Buscher et al.,

2020). Two reviews highlighted that digital interventions tended to be effective in building knowledge and skills (Chen & Chan, 2020; Kreuze et al., 2017) with comparable effect sizes on suicidal ideation seen in to face-to-face CBT-type interventions (Chen & Chan, 2020).

A growing number of mobile applications (apps) for the self-management of suicidal thoughts and behaviours have become available in recent years. However, few have been evaluated for their effectiveness in reducing suicide-related outcomes (Malakouti et al., 2020; Melia et al., 2020; Witt et al., 2017b). These apps are generally composed of elements drawn from cognitive behavioural therapy (CBT), acceptance and commitment therapy (ACT), and dialectic behaviour therapy (DBT). They may also incorporate activities to develop coping or emotional regulation skills, an action plan or emergency contact details (Melia et al., 2020; Witt et al., 2017b). A review of apps for the self-management of suicidal ideation and self-harm demonstrated reductions in suicidal ideation post-intervention. There was no evidence of an intervention effect for self-harm or attempted suicide. It was unclear if the observed reductions would be clinically meaningful (Witt et al., 2017b). A review of this approach for First Nations peoples showed promise, but little evidence of efficacy (Hobson, Caffery, Neuhaus, & Langbecker, 2019), another found reductions in suicidal ideation (Malakouti et al., 2020) and a high quality meta-analysis found a small, but significant effect on suicidal ideation (Hedges'  $g = -0.18$ , 95% CI  $-0.27$  to  $-0.10$ ,  $p < 0.0001$ ;  $I^2 = 0\%$ ,  $I^2$  CI  $0.047-9$ ) (Torok et al., 2020). It is important to note that interventions directly targeting suicidality were effective, whereas indirect interventions were not effective in reducing suicide ideation (Torok et al., 2020).

### *Telehealth and helpline interventions*

Despite these mixed findings across various digital modalities, reviews highlight the unique advantages for specific populations, including young people, people who live rurally, and indigenous populations. Although these populations are discussed more thoroughly in the following sections, a brief summary of findings is provided here; in student populations, digital interventions can reduce accessibility barriers and predominately demonstrate efficacy for increasing help-seeking behaviours, knowledge, and perceptions about suicide (Szlyk & Tan, 2020). Telehealth improves access for rural populations expressing suicidal ideation or behaviour, although no studies have directly examined the efficacy of telehealth in terms of suicide-related outcomes (Rojas et al., 2020). Similarly, in a review of eHealth platforms for First Nation populations in Australia, digital platforms appeared favourable; however, again

no significant indication of efficacy in terms of suicide-related outcomes was found (Hobson et al., 2019). Digital modalities also offer advantages for youth populations such as improvements in help-seeking behaviours, knowledge, and perceptions but we cannot yet determine which types of technology are better associated with positive outcomes (Forte, Sarli, Polidori, Lester, & Pompili, 2021; Szlyk & Tan, 2020).

Two reviews of telephone helplines for those experiencing suicidal behaviours were identified with the majority of included studies showing improvements in immediate and intermediate suicidal urgency and depressive states. Telephone helplines also received positive feedback from users and counsellors on service acceptability and helpfulness (Hvidt, Ploug, & Holm, 2016). However, this review is restricted by the low quality of included studies with evaluation of this type of intervention hampered by geographical spread and anonymity of callers. A meta-analysis of mobile and landline telephone psychotherapy interventions suggested this approach did not significantly reduce suicide attempts or suicides (Noh, Park, & Oh, 2016). On balance, while there is an appetite for the provision of these services, methodological limitations make it difficult to draw strong conclusions about their efficacy in terms of suicide prevention.

#### *Synthesis and implications for Aotearoa*

Overall, the digital delivery of interventions for suicidal ideation and self-harm may be a safe and acceptable option for those unwilling or unable to attend face-to-face delivery; however, we need to understand more about the risk-benefit ratio of digital delivery of interventions for these individuals (Arshad et al., 2020; Chen & Chan, 2020; Stefanopoulou et al., 2020). Effectiveness will be increased where interventions are designed to specifically target suicide-related behaviours (e.g., suicidal thoughts) rather than associated difficulties such as depression (Torok et al., 2020). However, rapidly increasing user expectations, high drop-out rates, low engagement, cultural responsiveness and safety, need to be considered.

#### *Brief contact interventions*

Brief interventions are a heterogeneous group of interventions. They include brief contact services such as helpline and telehealth services described above, follow-up interventions subsequent to hospital presentations, green or crisis cards, personalised letters, brief face-to-face therapies and psycho-education information sessions. This is another style of

intervention which is appealing, but where the benefits of this approach in terms of suicide-related outcomes are mixed (Hvidt et al., 2016; Katsivarda, Assimakopoulos, & Jelastopulu, 2021; Luxton, June, & Comtois, 2013; Milner, Carter, Pirkis, Robinson, & Spittal, 2015a). Some reviews of follow-up contacts using telephones and postcards following discharge from an emergency or psychiatric inpatient departments suggest that they may reduce suicidal behaviours (Luxton et al., 2013; McCabe, Garside, Backhouse, & Xanthopoulou, 2018), especially if contact is sustained for at least 12-months (McCabe et al., 2018). Brief face-to-face safety planning interventions (Nuij et al., 2021) and collaborative care and case management, involving scheduled patient follow-ups and multi-professional approaches, were considered to have demonstrated reductions in suicidal ideation (Grigoroglou et al., 2021). Conversely, other reviews found no significant reductions in suicide attempts, suicides (Noh et al., 2016), or suicidal ideation (McCabe et al., 2018). An all-ages review and meta-analysis of 14 brief acute care interventions (mostly ED settings, <2 contacts) showed a positive effect of brief suicide prevention interventions in reducing subsequent suicide attempts and enhancing linkage to follow-up (Doupnik et al., 2020). However, the more recent Cochrane review concluded there is no evidence to support a range of brief contact interventions after ED presentations including GP letters, postcards, phone-calls, alone or in combination for adults (Witt et al., 2021c). This is another area of clinical interventions where there are study design difficulties in conducting comparison and evaluations of this approach due to large variations in types of interventions and outcome measures used (Katsivarda et al., 2021).

#### *Collaborative Assessment and Management of Suicidality (CAMS)*

Select reviews have evaluated the efficacy of a model of care described as the Collaborative Assessment and Management of Suicidality (CAMS) (Hanratty, Kilicaslan, Wilding, & Castle, 2019; Swift, Trusty, & Penix, 2021). CAMS is a therapeutic style and set of procedures to enhance suicide focused assessment and intervention, focusing on an empathetic and non-judgmental stance to support exploration of a person's suicidal behaviour and flexibly tailoring intervention to address the persons challenges. A recent meta-analysis provided evidence for CAMS as an intervention for suicidal ideation with reductions in distress and hopelessness, drop-out, and higher levels of satisfaction. No differences were found for suicide attempts, self-harm or cost-effectiveness and effect sizes for CAMs were significantly smaller in military, veteran, and male samples (Swift et al., 2021). The gold

standard Cochrane review found no evidence of effectiveness on self-harm repetition at 12-month follow-up (Witt et al., 2021c). The general philosophy of aspects of this approach overlaps with SafeSide, which has attracted interest from a number of Te Whatu Ora locality mental health teams. Studies of SafeSide are not yet incorporated in any of the reviews or ROR identified for this project.

### *Synthesis and implications for Aotearoa*

Similar to other intervention approaches, evidence supporting the use of brief interventions is mixed, with a significant number of methodological limitations, particularly studies which are underpowered. In the face of these findings, it is important to consider that people with lived experience of suicidal distress and their supporters, frequently request compassionate and responsive care, in which continuity and access to appropriate treatment options are central (Scarth et al., 2021).

Future studies in Aotearoa, investigating the efficacy of brief interventions need to focus on using standardised evaluations and interventions (Grigoroglou et al., 2021; Milner et al., 2015a; Noh et al., 2016), with an emphasis on determining what specific factors make particular follow-up methods more effective than others (Luxton et al., 2013; Nuij et al., 2021), investigating whether improvements are sustained over the long-term (Grigoroglou et al., 2021; Hvidt et al., 2016; McCabe et al., 2018) and determining appropriate interventional dosages in terms of length and frequency of contacts (Katsivarda et al., 2021; Luxton et al., 2013).

### *Treatment for alcohol use problems*

Acute and chronic alcohol consumption is associated with suicidal behaviour. A thorough review of alcohol-related psychological interventions delivered to a range of individuals presenting with problematic alcohol use, in addition to a broad range of presentations, across a broad range of settings has been conducted (Witt et al., 2021a). Interventions ranged in intensity from a brief alcohol screen delivered in ED, to CBT, motivational interviewing and internet delivered DBT. This review found that alcohol-related interventions may contribute to a reduction in self-harm at the individual level (OR 0.57, 95% CI 0.33 to 0.97, 6 studies, 491 participants,  $I^2 = 0\%$ ); however they were unable to determine the effect of these interventions on suicidal ideation or suicide deaths (Witt et al., 2021a). Similar findings were reported for adults and adolescents with problematic alcohol use in another review evaluating



psychosocial interventions (Hurzeler et al., 2021). Padmanathan et al., (2020) reported evidence of a small positive effect of interventions on suicide and self-harm outcomes ( $d = -0.20$ , 95%CI =  $-0.39-0.00$ ) in populations with substance use disorder.

### *Synthesis and implications for Aotearoa*

Alcohol control was highlighted as an effective whole of population approach to suicide prevention, and should be supplemented by ready access to effective treatments for those with substance misuse challenges in Aotearoa New Zealand.

### *Pharmacological interventions in adult populations*

In this review we have only included reviews and ROR where a primary focus is suicide prevention. A review of pharmacological interventions for the treatment of common mental disorders associated with suicidal behaviour more generally is beyond the scope of this review. There is uncertain evidence regarding pharmacological interventions in adult patients who engage in self-harm, including non-suicidal self-injury (NSSI) (Turner, Austin, & Chapman, 2014; Witt et al., 2020a). A review conducted by Suicide Prevention Taskforce Members of the National Network of Depression Centres concluded that “*the effect of antidepressants is not at all clear. There appears to be direct evidence for antidepressants increasing suicidal ideation and the risk for suicide over the short-term in young people, but indirect (low quality) evidence that antidepressants reduce suicide risk over the long term*” (Hawkins et al., 2021a, p.1). The risk profile for children and adolescents was also raised in a recent Cochrane Systematic Review (Hetrick et al., 2021) and is addressed in a subsequent section. A review of selective serotonin reuptake inhibitor (SSRI) treatments for depression in older adults also raised concern that there may be an increased risk of suicide and suicide attempt in older people with major depression on SSRI treatment (over a 2- to 11-year period) compared to no treatment (KoKoAung & Aromataris, 2012) which requires further investigation.

One review (without metanalysis) (Serafini et al., 2018) suggested that Buprenorphine (BUP) may be a safe option in reducing depressive symptoms, serious suicidal ideation and NSSI. However, evidence quality was moderate to low and further evidence is required. A review of available evidence for the impact of psychotropics on suicidal risk in those with bipolar disorder concluded that the evidence available at that time was methodologically flawed and lacked clinical utility (Yerevanian & Choi, 2013). However, a more recent review

Wilkinson et al., (2021) of pharmacological (excluding antidepressants) and somatic interventions on suicide, and reported that in those diagnosed with a psychotic disorder, clozapine was associated with a reduction in odds of suicide, however there was no consistent relationship between antiepileptic mood stabilizers and suicide outcome (Wilkinson et al., 2021). Two pharmacological interventions, ketamine (Witt et al., 2020b) and lithium (Hawkins et al., 2021b) are addressed in separate sections below.

### *Pharmacological treatment of depression in young people*

The use of medication to treat depression in young people needs to be balanced with evidence that there is an increased risk of suicide-related outcomes in those treated with antidepressant medications (Hawkins et al., 2021b). A recent Cochrane meta-analysis of new generation antidepressants for depression in children and adolescents reported very uncertain evidence for the “effect of mirtazapine (OR 0.50, 95% CI 0.03, 8.04), duloxetine (OR 1.15, 95% CI 0.72, 1.82), vilazodone (OR 1.01, 95% CI 0.68, 1.48), desvenlafaxine (OR 0.94, 95% CI 0.59, 1.52), citalopram (OR 1.72, 95% CI 0.76, 3.87) or vortioxetine (OR 1.58, 95% CI 0.29, 8.60) on suicide-related outcomes compared with placebo. Low certainty of evidence that escitalopram (OR 0.89, 95% CI 0.43, 1.84) may “at least slight” reduce odds of suicide-related outcomes compared to placebo and that fluoxetine (OR 1.27, 95% CI 0.87, 1.86), paroxetine (OR 1.81, 95% CI 0.85, 3.86), sertraline (OR 3.03, 95% CI 0.60, 15.22), and venlafaxine (OR 13.84, 95% CI 1.79, 106.90) may “at least slightly” increase the odds of suicide-related outcomes compared with placebo” (Hetrick et al., 2021., p.2). There are a limited number of methodologically sound trials and the size and clinical meaningfulness of statistically significant results are uncertain. Most studies do not include suicide as a primary outcome measure and/or exclude those experiencing suicidal distress (Hetrick et al., 2021).

### *Ketamine:*

Recent reviews suggest that ketamine, when used as an intervention for treatment resistant depression in adults, may have a positive short-term (24-48 hours) effect in reducing suicidal ideation in populations with psychiatric disorder, however the evidence was rated low to moderate and marked heterogeneity was noted (Bartoli et al., 2014; D'Anci, Uhl, Giradi, & Martin, 2019; Hawkins et al., 2021b; Hochschild, Grunebaum, & Mann, 2021; Maguire, Bullard, & Papa, 2021; Reinstatler & Youssef, 2015; Siegel et al., 2021; Wilkinson et al., 2018; Witt et al., 2020b; Xiong et al., 2021). Ketamine may have an application as an agent

to treat acute suicidality presenting in a clinical setting (Hochschild et al., 2021; Witt et al., 2020b). However, there is more to be learnt about long-term benefits and impact on suicidal behaviours (Hochschild et al., 2021; Kritzer et al., 2021; Wilkinson et al., 2018; Witt et al., 2020b). Further research is required to confirm efficacy of ketamine on suicidal ideation and to explore the impact on suicidal ideation over periods greater than 72 hours (Maguire et al., 2021; Siegel et al., 2021; Witt et al., 2020b). We also need greater understanding about long-term effects including abuse, in addition to variations in dosage and frequency of administration (Hochschild et al., 2021; Kritzer et al., 2021; Maguire et al., 2021); route of administration, (e.g., intravenously; intranasal) (Maguire et al., 2021; Xiong et al., 2021), diverse clinical populations (Hochschild et al., 2021; Maguire et al., 2021). Many of these studies on Ketamine have been conducted in the USA, among adults and with predominantly female participants. It is also important to consider how delivery of this treatment option could best operate within current health services in Aotearoa New Zealand.

### *Lithium*

Evidence suggests that lithium may provide a reduction in suicide deaths and suicide attempts, over the long-term, in patients with mood/affective disorders (Cipriani, Hawton, Stockton, & Geddes, 2013; D'Anci et al., 2019; Del Matto et al., 2020; Hawkins et al., 2021b; Lewitzka et al., 2015; Tondo & Baldessarini, 2018; Wilkinson et al., 2021); including during depressive phases of Bipolar Disorder (BD) and Major Depressive Disorder (MDD) (Tondo & Baldessarini, 2018). There are less clear benefits for preventing self-harm (Cipriani et al., 2013). Lithium discontinuation has been associated with increased suicide risk (Hawkins et al., 2021b). A review of a small number of studies ( $N = 9$ ) investigated naturally occurring lithium in general population drinking water suggested that higher lithium levels may be associated with reduced rates of suicide (Vita, De Peri, & Sacchetti, 2015). A more recent review of ecological studies ( $N = 16$ ) reported the same relationship between local water lithium levels and reduced suicide mortality rates (Del Matto et al., 2020).

### *Seizure therapy and non-invasive brain stimulation*

Non-invasive brain stimulation (e.g., electroconvulsive therapy (ECT), magnetic seizure therapy, transcranial magnetic stimulation (TMS), transcranial direct current stimulation) have all been suggested as interventions for suicidality for those diagnosed with mental health disorders. There appears to be some evidence that ECT may provide benefit for acute suicidal

ideation for some people, but more general conclusions about this group of interventions cannot be drawn with regards to efficacy due to difficulties with study design (Chen et al., 2021c; Kucuker et al., 2021). Serafini et al., (2021) concluded that transcranial magnetic stimulation (TMS) may be considered an effective, safe and well-tolerated intervention for suicidal behaviour in adults with diagnosed mental health disorders, however, interactions between the intervention, suicide-related outcomes and depression are not clear.

### *Synthesis and implications for Aotearoa*

A review of pharmacological interventions for the treatment of common mental disorders associated with suicidal behaviour more generally is beyond the scope of this review. The Suicide Prevention Taskforce Members of the National Network of Depression Centres concluded that “*the effect of antidepressants is not at all clear. There appears to be direct evidence for antidepressants increasing suicidal ideation and the risk for suicide over the short-term in young people, but indirect (low quality) evidence that antidepressants reduce suicide risk over the long term*” (Hawkins et al., 2021a, p.1). The risk profile for children and adolescents has also been raised Cochrane Systematic Review (Hetrick et al., 2021) and there is some suggestion that a similar effect could be observed in older adults. Some individuals may experience benefit from appropriately prescribed and supervised prescribing, or use of non-invasive brain stimulation, in collaboration with their health care provider.

### *Systems of care in Aotearoa New Zealand*

In New Zealand, the Suicide Mortality Review Committee (Suicide Mortality Review Committee, 2016) and the Ministry of Health (Ministry of Health, 2021c) have both recognised the importance of understanding how to reduce deaths by suicide among people in contact with mental health services. A systematic review of international studies on changes implemented after patient suicides in mental health services, concluded that adverse event reviews of suicide deaths in this population tend to repeat recommendations such as removal of ligature points, management of absconding and improvements to risk assessment, which themselves are almost always stated in existing policies and procedures (Ramsey, Galway, & Davidson, 2021). These authors highlighted the fact that much less attention has been directed to implementation of suicide prevention recommendations, evaluation of implementation and the leadership and organisational characteristics that foster meaningful change in light of recommendations (Ramsey et al., 2021).

The relatively low adherence to existing policies, procedures or practice guidelines relevant to suicide prevention is an important area for improvement (Wilson et al., 2021b). A review of adherence to Clinical Practice Guidelines in the Emergency Department settings suggested that low rates of adherence in this setting may reflect the fact that clinical practice guidelines tend to be written by non-Emergency Department staff so may not reflect the clinical reality of the Emergency Department setting. Clinical Practice Guidelines sponsored by large organisations such as the local Australian and New Zealand College of Psychiatry (Carter et al., 2016), tend to be of higher quality however many guidelines are of relatively low quality (Wilson et al., 2021b). A broader review of CPG for the management of suicidal behaviour is beyond the scope of this particular review but the most up to date CPG from NICE is [here](#).

## 4. Interventions for specific settings

### *Workplaces - overview*

In their systematic review Milner et al., (2015) assessed workplace suicide prevention interventions such as short-term training activities, as well as suicide prevention strategies designed for occupational groups at risk of suicide; of the 13 studies included, most had been conducted in the United States and Australia and involved a gatekeeper training programme to enhance risk recognition and referrals to mental health services. Some of these were internationally recognised programmes such as ASIST, QPR, SafeTALK and Suicide TALK (Milner, Page, Spencer-Thomas, & Lamotagne, 2015b). Evidence for workplace interventions in New Zealand, is addressed the later Aotearoa New Zealand focused section as they have not yet been included in reviews or ROR.

### *Workplaces - First responders*

Due to the generally high prevalence of men in the first responder workforce and also the real prospect that aspects of their work result in exposure to experiences that may cause distress, suicide prevention interventions for military personnel, police, prison staff, ambulance and fire fighters have been of interest to suicide prevention practitioners. A systematic review and meta-analysis of 13 studies (mostly from the USA), reported that most programmes focussed on selective and indicated level interventions. A few used universal interventions such as resiliency training or addressing job related stress by providing support such as leadership training for supervisors. Selective interventions included gatekeeper training, suicide surveillance data systems (to monitor trends and evaluate outcomes) and peer-support programmes. Indicated interventions focussed on crisis hotline provision, suicide intervention skills training, and postvention services. This review indicated a halving of suicide rates over a mean follow-up period of 5.3 years. Universal prevention interventions addressing primary source of stress within organisations are relatively few, with most programmes including a combination of selective and indicated level interventions (Witt, Milner, Allisey, Davenport, & LaMontagne, 2017a). Given the multicomponent nature of these evaluated interventions, it is somewhat difficult to clearly identify which are the active elements of this prevention approach.

### *Workplaces - healthcare professionals in healthcare settings*

Suicide prevention activities have tended to view healthcare professionals as part of prevention and delivery of interventions (e.g., Audouard-Marzin, Kopp-Bigault, Scouarnec,

& Walter, 2019; Dabkowski & Porter, 2021; Ferguson et al., 2018) and to date there has been relatively little work examining initiatives for suicide prevention among healthcare professionals. A review investigating the efficacy of peer support groups for those bereaved by suicide (Bartone, Bartone, Violanti, & Gileno, 2019) included six studies of health care professionals. Although limited by primarily qualitative and observational investigations, the review suggested that peer support groups eased isolation and grief, while improving a sense of coping and support. Additionally, there are two reviews investigating cognitive behaviour therapy (CBT) (Leavey & Hawkins, 2017) and self-guided digital interventions (Torok et al., 2020) included one study examining the use of an online CBT programme for insomnia ('called MOODGym') among medical interns which reported a significant reduction in suicidal ideation across a 12-month follow-up period (Guille et al., 2015).

### *Synthesis and implications for Aotearoa*

Workplaces appear to be a promising location for intervention; however, it is important that interventions in these settings address organisational and structural determinants of workplace stress, in addition to selective and indicated interventions. There has been widespread promotion of Mates in Construction as an industry-based prevention programme in New Zealand building on earlier work in Australia. A recent evaluation published by MATES suggested that participants rated their knowledge and intention to seek help more positively after participation in this programme, although there was an increase in the number of participants who said they would seek help from 'no-one' after participation. This programme appeared more effective for female compared with male participants. It is not possible to establish whether or not these effects are maintained over time given that only 3.2% of those who participated in the training completed a follow-up survey (Wilson, Bryson, & Bartolo - Doblaz, 2021a).

There has been recent commentary for example by the [NZMA](#) about the need to focus on health care workers given prevalence of burnout, secondary traumatic stress and increased challenges with related to the ongoing COVID-19 pandemic (Awan et al., 2021), the further development and evaluation of current initiatives for healthcare workers is urgently needed. In Aotearoa New Zealand, we have approximately 12,000 first responders; however, there are a lack of tailored initiatives and support in place for this workforce. There is a need for evaluation of interventions already in place for first-responder populations and continued development of effective interventions to address the needs of this population (Witt et al.,

2017a). The interim report of the Royal Commission of Inquiry into Suicide among Australian defence personnel has recently been released ([https://defenceveteransuicide.royalcommission.gov.au/system/files/2022-08/interim\\_report.pdf](https://defenceveteransuicide.royalcommission.gov.au/system/files/2022-08/interim_report.pdf)) and there is the opportunity for learnings from this process, in addition to recognising the unique challenges for defence force personnel in Aotearoa New Zealand.

### *Primary Care as a setting*

General practice is an attractive location for offering suicide prevention interventions for several reasons; first, many people who die by suicide have seen a general practitioner (GP) in the year prior to death. Secondly, most people experiencing suicidal distress are not in the care of mental health services and thirdly, New Zealand has invested heavily in primary mental health care.

A robust review and meta-analysis by Milner and colleagues (Milner et al., 2017), evaluated interventions provided by GP's in primary care settings, provided just by a GP or in combination with other professionals, incorporating both standalone interventions and those delivered as part of larger multicomponent interventions. Interventions were varied (Audouard-Marzin et al., 2019; Dueweke & Bridges, 2018) but mainly focused on improving knowledge, assessment, treatment and management of depression using a combination of workshops, written materials and for a small number, an additional focus on case management. Some studies have also incorporated screening, which is dealt with in a separate section. There is some evidence from pre- and post- intervention studies of a significant reduction in suicide rates, but not when comparisons are made with a 'control'. One cluster randomised control trial (cRCT) suggested that the GP intervention was associated with a non-significant increase in suicide deaths (Milner et al., 2017). Evaluations of non-fatal suicidal behaviours showed a similar pattern with some promise when using a pre- and post-test historical control design, and possible harm when compared to control, and benefit for female but not male patients (Milner et al., 2017). This review also evaluated the impact of interventions on prescription rates and GP knowledge, but need a clear rationale to understand their connection to suicide prevention (Milner et al., 2017). The effectiveness of GP interventions for youth have not been well-researched (Robinson, Calcar, & Bailey, 2018b). There is some evidence of a protective effect of GP letters following hospital presentation for self-harm among female participants, but the same review was unable to find



evidence of effect for structured GP follow-up on repetition, treatment adherence, depression, hopelessness or suicidal ideation (Witt et al., 2021c).

### *Synthesis and implications for Aotearoa*

Although general practice presents an attractive location for suicide prevention initiatives, current evidence among this setting is limited and interventions have been developed and tested from a largely western-psychiatric perspective. Possible benefits have been reported for female patients; however initiatives also indicated harm when compared to control conditions (Milner et al., 2017), highlighting the need for programmes to be evaluated. In Aotearoa New Zealand the development of services focused on providing rapid access to psychological treatments in primary care settings through dedicated mental health and addiction support workers and integrated Health Improvement Practitioners (HIPs) may have the potential to reduce to suicidal behaviour, but has not yet been evaluated.

### *Rural settings*

We found few reviews that examined effectiveness of suicide prevention interventions designed specifically for non-urban or rural populations. The three reviews identified all comment on the lack of rigorously designed research studies in this area. A review of the effectiveness of four gatekeeper interventions (listed in the Best Practices Registry funded by SAMHSA) for people living in small non-urban communities included ten peer-reviewed studies and suggested strong evidence of efficacy for ASIST (Applied Suicide Intervention Skills Training) and QPR (Question, Persuade and Refer) programmes. However, these studies had methodological limitations including lack of follow-up data, lack of control group and poor selection of outcome variables which limits the strength of review findings (Herron et al., 2016).

Melia et al., (2020) reviewed the effectiveness of mobile health technology interventions (which are addressed in more detail in the section on digital health) for mixed population groups including indigenous youth in rural Australia with history of suicidal behaviour. Interventions using a range of apps such as iBobbly, Virtual Hope, BlueIce were reviewed some of which were designed for rural and remote populations, while others were not. iBobbly, an intervention specifically designed for rural Indigenous young people, showed some positive impact on depression but not suicidal ideation (Melia et al., 2020). Rojas and colleagues (Rojas et al., 2020) conducted a narrative review including a number of practice

guideline and case study methodologies on the use of tele mental health (two-way synchronous clinical video technology) to deliver suicide specific interventions. A large proportion of the studies focused on the logistics of conducting suicide risk assessments using this approach, with a smaller number of studies looking at delivery of interventions. Due to the methodological limitations of the included 22 studies, authors were unable to draw definitive conclusions regarding efficacy or effectiveness of interventions for suicidal behaviours in rural populations.

### *Synthesis and implications for Aotearoa*

Although gatekeeper training and mobile health technology interventions in rural settings are an attractive proposition to reduce inequity in health outcomes, the heterogeneity of outcomes and poor study quality limit the ability to make strong recommendations. The opportunity to increase reach, and decrease travel distances needs to be balanced with ongoing limitations to internet speed in some rural locations and personal preferences for in person relationships. There are a large number of grass-roots activities in the rural community across Aotearoa New Zealand, many of which focus on reducing loneliness and increasing connection, particularly for young men. Further evaluation of these programmes is indicated.

### *Education settings*

Several reviews have focused on the effectiveness of interventions in education settings. Many of these interventions were gatekeeper training programmes, some including screening, and a smaller number including youth mental health awareness, youth mental health literacy and emotional problem-solving interventions. An early review examined universal and indicated interventions and suggested that school-based interventions could have a positive impact on suicide-related behaviour and did not appear to cause harm (Robinson et al., 2018b). A more recent review separated included studies into two intervention types (gatekeeper and educational interventions), although there was a great deal of similarity in the knowledge taught in both the gatekeeper and direct educational interventions (Pistone, Beckman, Eriksson, Lagerlof, & Sager, 2019). This review found a positive effect of school based educational interventions on suicide attempt at 3-month follow-up (OR=0.56, 0.39-0.80, p=0.001) and 12 -month follow-up (OR=0.60, 0.38-0.95, p=0.03) and suicidal ideation at 12 months (OR=0.54, 0.35-0.81, p<0.003), with moderate study quality overall (Pistone et al., 2019). However, the metaanalysis was unable to demonstrate an effect on gatekeeper

skills for gatekeeper training at 3-6 months follow-up or on suicidal ideation among populations supported by those who received gatekeeper training. These reviews suggested that changes in suicidal behaviour were more likely if students are involved as both gatekeepers and the target population rather than another group, such as teachers, acting as gatekeepers for pupils. None of the included studies in the review had suicide as an outcome (Pistone et al., 2019).

Standalone gatekeeper interventions are one of the most commonly used interventions in educational settings as noted above. In recent years a number of reviews have reported modest or no gains from gatekeeper interventions in school and college/university campus settings (Black et al., 2021; Harrod, Goss, Stallones, & DiGuseppi, 2014; Torok et al., 2019; Wolitzky-Taylor, LeBeau, Perez, Gong-Guy, & Fong, 2020). A review of gatekeeper training interventions on college campuses showed relatively smaller effect size for skills compared to knowledge and self-efficacy with no data available regarding changes in suicidal behaviour (Wolitzky-Taylor et al., 2020) or impact on student outcomes (Black et al., 2021). Gate keeper training may be more effective in enhancing the subjective experience of addressing suicide, rather than having an impact on the more objective likelihood to intervene (Wolitzky-Taylor et al., 2020). Overall, there is a lack of evidence that these interventions can actually change participant behaviour (Torok et al., 2019).

### *Synthesis and implications for Aotearoa*

While education settings provide an accessible setting to deliver suicide prevention interventions, one needs to be cautious about what one can expect in terms of suicide prevention. It appears that changes in suicidal behaviour are more likely if students are involved as both gatekeepers and also the target population rather than another group, often adults, acting as gatekeepers for pupils. It is hard to disaggregate the effective elements of the interventions, as most studies have included multicomponent interventions, often gatekeeper+education. Gatekeeper training alone may not bring desired reductions in suicidal behaviour. Most evaluated interventions have been designed by adults and delivered to young people, so there is a strong need for co-design of these programmes. In addition, a whole of school approach has been shown in New Zealand based research to have a positive impact on student mental health; suicide prevention needs to be integrated into every aspect of daily school life to have a sustained impact (Denny et al., 2018). Future research needs to employ longer-term follow-up (Surgenor, Quinn, & Hughes, 2016) and include measurement

of actual changes in suicide related behaviours for gatekeeper training interventions (Torok et al., 2019). There is a need for more suicide prevention initiatives in university settings (Calear et al., 2016b; Robinson et al., 2018b).

## 5. Target population groups

### *Youth*

Several reviews, and review of reviews, have been conducted to assess the effectiveness of interventions for children, adolescents and youth which have been delivered in a range of intervention levels and are outlined below. More detail pertaining to youth interventions in specific settings, such as education and in-patient settings are explored in their own dedicated sections.

A review to support on child and adolescent suicide prevention in Canada concluded that school-based interventions led to reductions in suicide attempts and suicidal ideation. There was some evidence that emergency department transition programmes may reduce hospitalisations, and reduce treatment non-adherence (Bennett et al., 2015). A review of 28 RCTs for young people aged 12 - 25 years, examined a range of psychosocial interventions across a range of settings such as in school, community and healthcare settings and reported a significant effect on suicidal ideation (Cohen's  $d = 0.16-3.01$ ), suicide attempts ( $\phi = 0.04-0.38$ ) and deliberate self-harm ( $\phi = 0.29-0.33$ ;  $d = 0.42$ ) (Calear et al., 2016b).

One of the most comprehensive reviews of interventions for young people including  $n = 99$  studies spanning a range of settings and study designs. This review concluded that in clinical settings there was little evidence that interventions reduced repeated SH post-intervention, although there may be a small effect on frequency of self-harm if measured continuously (Robinson et al., 2018a). There was strong evidence of a small effect on suicidal ideation post-intervention. In educational settings, there was some evidence regarding effectiveness of school-based psycho-educational interventions. In community settings, there was mixed evidence regarding efficacy of intervention due to variable study quality (Robinson et al., 2018a).

A later review of reviews examined effect of interventions across various settings in preventing self-harm and suicide in children and adolescents (Morken, Dahlgren, Lunde, & Toven, 2019) concluded there was evidence of moderate to low certainty suggesting that school-based suicide prevention programmes could prevent suicide ideation and suicide attempts in young people and unclear evidence regarding any protective effects of local suicide plans and community-based interventions (often led by psychiatric services) following suicide clusters. Similarly, there was evidence of low certainty suggesting that

DBT and developmental group therapy were equally effective as enhanced treatment as usual (often established treatment approaches such as individual and/or family psychotherapy) for repetition of self-harm (Morken et al., 2019).

### *Universal*

In contrast to the reviews outlined above that included interventions across Universal, Selective and Indicated intervention levels in different settings, there were fewer reviews of universal interventions, although the findings are comparable. For example, a metaanalysis of 11 RCTs to examine effectiveness of school-based preventative programmes on suicidal thoughts and behaviours and reported small effect sizes for both suicidal ideation (pooled Hedges'  $g = 0.15$ ,  $p = .001$ ) and suicidal behaviours (pooled Hedges'  $g = 0.30$ ,  $p < .001$ ) at post-intervention. Similarly, school-based prevention of suicidal thoughts and behaviours showed promising results at three months post-intervention. Interventions included SOS, Headstrong, Mindfulness and YAM many of which were delivered by teachers. In this review, authors dichotomised prevention strategies into singular intervention or multimodal. Multimodal were those where screening was completed before the start of the intervention. Screening was not examined as a separate intervention (Gijzen, Rasing, Creemers, Engels, & Smit, 2022).

We identified one recent review on means restriction, which focused on the effect of child access prevention firearm laws on firearm outcomes among children and adolescents. This review suggested mixed evidence, but overall optimism for an association between strong child access protections and reduced firearm suicides (Zeoli et al., 2019).

### *Selective*

Relatively few reviews have examined selective interventions in this population. One review found no evidence of superior efficacy for psychological treatments for depression compared to a variety of control treatments (active treatment groups such as pharmacotherapy or TAU) in reducing suicidality among adolescents with depression. However, Attachment Based Family Therapy (ABFT) and Interpersonal Psychotherapy, which focus on relationships appeared to be promising (Devenish, Berk, & Lewis, 2016).

### *Indicated*

Several systematic reviews have been conducted recently to examine the effectiveness of a range of indicated interventions provided to children and adolescents who experience suicidal behaviour. While there is some evidence that receiving therapeutic interventions results in reduction in self-harm, there is insufficient information to be able to indicate any hierarchy of treatment options based on their effectiveness, that is to say that the outcomes for many interventions are similar and client and whānau preference should be taken into account.

A systematic review and meta-analysis of 30 RCTs of psychosocial treatments for suicide prevention among adolescents concluded that overall, interventions were non-significant for self-harm behaviour ( $d=0.97$ ) or suicide attempt ( $d=0.03$ ) but decreased suicidal ideation with small effect size ( $d=0.08$ ,  $p=0.01$ ). Further, experimental interventions showed no clinically significant superiority to control treatments in improving SH behaviour (Itzhaky et al., 2021).

Several reviews have examined effectiveness of specific indicated interventions such as the DBT-A, CBT and Mentalisation Based Therapy and are addressed below.

### *DBT*

A recent meta-analysis ( $n=25$  RCTs conducted between 1999-2019) of different intervention types for adolescents who self-harm, including DBT-A, CBT, Group therapy, family therapy, therapeutic assessment, brief interventions and treatment as usual (TAU) reported moderate effects for DBT-A in reducing self-harm and suicidal ideation as well as for family-centred therapy in reducing suicidal ideation (Kothgassner, Robinson, Goreis, Ougrin, & Plener, 2020). It is important to note that moderate to large reductions were reported in self-harm behaviour and suicidal ideation among participants receiving good quality standard therapy (TAU/EUC). This finding suggests that high quality routine clinical care is effective at improving patient outcomes (Kothgassner et al., 2020). A subsequent review specifically examined the efficacy of DBT for adolescent SH and suicidal ideation, reported that overall, compared to control groups, DBT-A showed small to moderate effects for reducing self-harm ( $g = -0.44$ ; 95% CI  $-0.81$  to  $-0.07$ ) and suicidal ideation ( $g = -0.31$ , 95% CI  $-0.52$  to  $-0.09$ ) (Kothgassner et al., 2021).

Similar findings related to the effectiveness of DBT-A have been reported in a recently published Cochrane review, including only RCTs of psychosocial interventions in children

and adolescents who engage in SH (Witt et al., 2021b). This review concluded a lower proportion of SH repetition for DBT-A (30%) compared to TAU, EUC, or alternative psychotherapy (43%) and repetition of SH at post-intervention in four trials (OR 0.46, 95% CI 0.26 to 0.82). Similarly, a metaanalysis of 44 studies examining a range of psychotherapies for treatment of self-harm and suicidal behaviours among children and adolescents, showed that DBT-A was associated with reductions in self-harm (OR, 0.28; 95% CI, 0.12-0.64) and suicidal ideation (Cohen d SMD,  $-0.71$ ; 95% CI,  $-1.19$  to  $-0.23$ ) at the end of treatment compared with TAU (Bahji et al., 2021b). These findings are consistent with other reviews (Flaherty, 2018; Glenn, Esposito, Porter, & Robinson, 2019; Ougrin et al., 2015).

Given the small effect sizes across a number of these reviews, and the effectiveness of TAU/EUC, significant consideration needs to be given the relative cost of training and maintaining fidelity to this intervention compared with supporting quality treatment as usual.

### *CBT*

The most recent Cochrane review on interventions for SH in children and adolescents (Witt et al., 2021b) were unable to detect evidence of a difference for individual CBT-based psychotherapy and TAU for repetition of SH at post-intervention (OR 0.93, 95% CI 0.12 to 7.24; low-certainty evidence). This supersedes an older review which suggested that CBT had a significant treatment effect in reducing suicidal ideation ( $g = -.40$ , 95% CI  $[-.30, .49]$ ) and self-harm ( $g = -.27$ , 95% CI  $[-.17, .38]$ ) but not for suicide attempts (Labelle, Pouliot, & Janelle, 2015). CBT has been widely investigated with adults, with some promise and well-designed, well-powered studies of this as an intervention for suicidal children and adolescents are needed.

### *Mentalization-Based Treatment*

The Cochrane review (Witt et al., 2021b) did not find clear evidence for the effectiveness of mentalisation based therapy (MBT-A at post-intervention as compared to TAU (OR 0.70, 95% CI 0.06 to 8.46; very low-certainty evidence). In contrast, (Bahji et al., 2021b) reported that mentalization-based therapies were associated with decreases in self-harm (OR, 0.38; 95% CI, 0.15-0.97) and suicidal ideation (Cohen d SMD,  $-1.22$ ; 95% CI,  $-2.18$  to  $-0.26$ ) at the end of follow-up, however these authors did not provide any indication of certainty of



evidence and the methodology of a Cochrane review is considered the gold standard in terms of evidence synthesis.

### *Family-based treatment*

Family-based treatments makes developmental sense in the management of suicidal behaviour for children and adolescents; Aggarwal and Patton (2018) examined the effectiveness of a range of family interventions such as brief single sessions, intermediate level and intensive family interventions and reported that while brief interventions did not reduce adolescent self-harm, intermediate interventions such as the Resourceful Adolescent Parent Programme, Safe Alternatives for Teens and Youth Programme and attachment-based family treatment were effective in reducing suicidal behaviour (effect size 0.72), suicide attempts ( $P=0.01$ ) and suicidal ideations (effect size 0.95), however the long term effects remain unknown (Aggarwal & Patton, 2018). A selected narrative review of 16 RCTs on family-based treatments (CBT+ Parent training, family therapy, ABFT) for suicidal ideation and behaviour for adolescents suggested promising results for suicide-related outcomes (Frey, Hunt, Russon, & Diamond, 2022). The recent Cochrane review reported that family interventions were not significantly different compared to either TAU or EUC at post-intervention (OR 1.00, 95% CI 0.49 to 2.07; moderate-certainty evidence) in terms repetition of SH. However, a large study included in this review showed a positive impact of Family Therapy on caregivers and young people perceptions of well-being and self-reported suicidal ideation was significantly lower in the family therapy arm at 12 months, although this washed out at 18 month follow-up (Cottrell et al., 2020).

### *Other intervention types:*

A narrative of review of interventions for young people (<19 years) with suicidal behaviour often in combination with other factors such as depression, alcohol and substance use noted few interventions are effective for adolescents and even fewer intervention options for preadolescents (Busby, Hatkevich, McGuire, & King, 2020). We found one review that focused on children and adolescent's in-patient psychiatric settings. DBT, CBT and milieu therapy were the most commonly described intervention used in included studies, which were generally of poor quality. Other interventions included the use of safe kits, (a box that patients were encouraged to decorate and then fill with personally meaningful objects),

changes to the physical environment and enhanced staff training (Griffiths, Dawber, McDougall, Midgley, & Baker, 2021).

### *Synthesis and implications for Aotearoa*

In summary, the evidence is mixed for initiatives amongst youth; however, there are several areas of promise. For example, mental health awareness training appears to be effective and cost-effective amongst school settings (Morken et al., 2019). However, gatekeeper training does not generally achieve sustained changes and small effects of DBT on repetition are observed in clinical settings over and above other therapeutic approaches (Witt et al., 2021b). Future studies need to include short- and long-term follow-ups (Bahji et al., 2021a; Calear et al., 2016a; Calear et al., 2016b; Labelle et al., 2015), incorporate cost benefit analyses (Calear et al., 2016b), measure actual changes in suicide related behaviours (Morken, Dahlgren, Lunde, & Toven, 2020), tailor interventions to be developmentally appropriate (Busby et al., 2020) and be robustly appraised in terms of responsiveness to Māori and wider equity issues. Young males are under-represented in youth research (Calear et al., 2016b).

In Aotearoa more specifically, there are a number of psychological interventions, such as DBT, which are being rolled out in clinical and community settings with unknown fidelity and evaluation. Given the mixed evidence of effectiveness outlined above, there is a need for closer monitoring to ensure these interventions are applicable in our local context and not causing harm. Furthermore, the evidence related to significant reduction of self-harm in active control conditions can be used to provide a stepped-care approach in clinical practice. This will help expedite availability of treatments for those who need them the most. Additionally, there is much scope for increasing whānau-based interventions in Aotearoa, which may reduce suicidal distress through improvements in family connection and relationships.

### *Children in care*

Children and young people in out-of-whānau or home care are an important group who are more likely than peers to have life experiences associated with elevated risk of suicidal behaviour. This group are at increased risk of a range of adverse outcomes including suicidal behaviour, however, there is currently little evidence on effective interventions. A review of suicide prevention interventions for those in contact with child protection systems identified five studies; two were youth-focused and three targeted professional development (Russell,

Trew, & Higgins, 2021). The first youth-focused programme evaluated emotional intelligence therapy which aimed to develop emotional management skills, perception, understanding, and regulation. The second study evaluated Multidimensional Treatment Foster care programme was delivered by foster carers grounded in social learning theory to reduce delinquent behaviour. The three professional-focussed interventions included 1) safeTALK Training, designed to teach participants to identify warning signs/risk for suicide, supportively respond, and link the individual to professional assistance, 2) Question, Persuade, Refer a gatekeeper programme, and 3) the Youth and Depression training programme, an adapted version of the Youth Depression and Suicide: Let's Talk gatekeeper training (Russell et al., 2021).

The two youth-focused studies demonstrated moderate effectiveness regarding suicidal ideation. One of the youth-focused studies also measured suicide attempts, but the intervention did not significantly improve this outcome. Gatekeeper training improved carer knowledge, skills, attitudes, and self-efficacy toward suicide prevention after completion of the programmes, however there was mixed evidence of a sustained effect at 6-month follow-up. None of the studies measured outcomes directly related to suicidal thoughts or behaviour in young people (Russell et al., 2021).

### *Synthesis and implications for Aotearoa*

The evaluation of initiatives among children and young people in out-of-home care is limited; however, interventions aimed at improving emotion regulation skills and improving foster care environments and relationships show promise, and at least short term improvements in knowledge and attitudes after gate-keeper training with those involved in providing care (Russell et al., 2021). In Aotearoa, an evaluation of current approaches and their efficacy on suicide related outcomes is needed given the significant over-representation of care and protection contacts in children and adolescents who die by suicide, many of whom are Māori rangatahi (SUMRC et al., 2020).

### *Rainbow youth*

Suicide prevention research for rainbow youth is its infancy, with relatively few programmes tailored to meet the needs of this community despite an increasing understanding their needs (e.g., [Recent Youth 19 findings](#)). Most studies in this area have focussed on specific health outcomes such as sexual health and substance abuse or the treatment of depression (Russon,

Washington, Machado, Smithee, & Dellinger, 2021b). While a variety of approaches are effective for these outcomes in this population, these interventions remain untested for suicide prevention. One review identified a range of CBT based interventions, tailored to meet the needs of LGBTQIA+ youth, which have been developed and evaluated for acceptability and feasibility, including rainbow SPARX developed in Aotearoa. There has been some research on Attachment-Based Family Therapy (ABFT) modified to meet the needs of sexual and gender minority youth, delivered in LGBTQIA+ service organisations, mainly in the USA. This approach has shown clinical utility with sexual and gender minority youth and is currently being adapted for transgender youth. Preliminary effectiveness has been demonstrated for the use of modified ABFT with respect to suicide ideation (Russon, Morrissey, Dellinger, Jin, & Diamond, 2021a).

### *Synthesis and implications for Aotearoa*

While early findings for initiatives for rainbow youth are promising, research in this area has generally used feasibility and pilot study designs and sample sizes have been too small to demonstrate effectiveness (Russon et al., 2021b). As a heterogeneous group, future research needs to differentiate between the needs of specific sexual and gender minorities. Attachment based family interventions show promise (Russon et al., 2021a) indicating the potential utility and efficacy for whānau involvement in Aotearoa.

### *Older Adults*

There is relatively limited research examining the efficacy of intervention programmes for older adults (Chauliac, Leaune, Gardette, Poulet, & Duclos, 2020; O'Connor, Gaynes, Burda, Soh, & Whitlock, 2013; Wallace, Miller, Fields, Xu, & Mercado-Sierra, 2021; Wyart, Abbar, & Courtet, 2012; Zeppegno et al., 2019). The importance of recognising and referring older adults with both physical and mental health needs in primary care is one approach to suicide prevention (Holm, Salemonsén, & Severinsson, 2021). Most interventions to date have focused on detection and treatment of depression (Lapierre et al., 2011; Okolie, Dennis, Simon Thomas, & John, 2017; Wyart et al., 2012) and this approach may be effective in primary care when using personalised treatment and close follow-up, with two particularly large trials incorporating psychological and physical health interventions (Okolie et al., 2017). Psychological interventions particularly those using problem solving approaches, telephone counselling, and multi-level intervention community programmes have showed some

promising results particularly in Japan (Okolie et al., 2017). Relatively little is known about what is effective for suicide prevention for older adults living in rest homes and long-term care facilities, one review suggests that gate-keeper training for rest home staff had some impact on the way suicidal residents were cared for however, but there was no impact on suicidal ideation or behaviours (Chauliac et al., 2020).

A review of selective serotonin reuptake inhibitor (SSRI) treatments for older population, which included both RCT and observational studies, found a possible association between SSRI use and an increased risk of suicide attempt and suicide in this population (KoKoAung & Aromataris, 2012), but requires further evaluation.

Dong et al., (2015) reviewed suicide prevention for the global Chinese aging population, which is growing in New Zealand, and suggested that measures to improve protective factors (family and community care relationships, addressing cultural and language barriers) were important for the Chinese population living both in China and internationally.

### *Synthesis and implications for Aotearoa*

Suicide prevention for older adults has been largely neglected, in New Zealand and around the world. Given the aging population in Aotearoa, more attention should be paid to the development and investigation of safe, culturally responsive, and effective initiatives for this population both in their own homes, and in aged-care facilities. High quality trials to investigate efficacy are urgently needed (Okolie et al., 2017; Wallace et al., 2021; Zeppegno et al., 2019), particularly in determining what particular aspects of multi-faceted interventions are most effective (Okolie et al., 2017) in the New Zealand context. Reducing access to certain methods is worth considering given the epidemiology of suicide among older adults in Aotearoa (Barak, Cheung, Fortune, & Glue, 2020).

### *Men*

Despite the prevalence of deaths by suicide by those who identify as men, only a small number of prevention initiatives and interventions for men have been reviewed (Joe, Scott, & Banks, 2018; Struszczyk, Galdas, & Tiffin, 2019). These identified reviews were descriptive and did not synthesis data on efficacy (Joe et al., 2018; Struszczyk et al., 2019). The included interventions spanned awareness campaigns, community gatekeeper training, psychological interventions, and education initiatives targeting men experiencing depression (Struszczyk et

al., 2019). A review of interventions for Black adolescent males experiencing suicidal distress found insufficient evidence to draw strong conclusions for this community (Joe et al., 2018).

### *Synthesis and implications for Aotearoa*

Further research is urgently needed to examine the perspectives of men experiencing suicidal distress and what interventions work for them within a New Zealand context. Population level interventions including alcohol control, safe storage of fire-arms and reducing unemployment in periods of recession appear to prevent deaths by suicide in men. As with other population groups, research in this area needs to use more consistent and standardised measures of suicidal behaviours and ideation to enable appropriate evaluation and comparisons of efficacy (Joe et al., 2018).

### *People in prisons*

A number of suicide prevention interventions have been investigated in prison populations, including risk assessment of prisoners (Gould et al., 2018), environmental modifications (such as staff training, increased observation, monitoring and safer physical environments) (Barker, Kolves, & De Leo, 2014), and psychotherapy interventions (Ekanem & Woods, 2021; Winicov, 2019). A systematic review of eight studies on effectiveness of prison-specific suicide screening tools in adult incarcerated offenders concluded that there was very limited evidence to recommend the use of suicide screening tools in this setting (Gould et al., 2018), consistent with the broader literature on suicide risk assessment which has already been outlined (Fortune & Hetrick, 2022a). A broader systematic review of management of self-harm and suicidal behaviour in prison settings identified 12 studies, of which 6 used multi-component approaches (e.g., staff training, increased observation and monitoring, safer physical environments, mental health services, access to hospitalisation, reduced use of isolation, post-suicide staff support), 2 focused on peer support and 4 focused on clinical assessment and care of those experiencing suicidal distress (Barker et al., 2014). The success of these programmes depends on the extent to which they can modify factors that are unique to the incarcerated population and the incarceration experience, over and above the generally high rates of suicidal distress that those who experience incarceration carry with them due to their prior experiences of adverse life events (Barker et al., 2014). This review suggested that peer support programmes have promise (Barker et al., 2014).

A narrative synthesis of 10 studies of interventions for managing NSSI among incarcerated women reported mixed findings and did not include a meta-analysis (Ekanem & Woods, 2021). An earlier systematic review of CBT, DBT, peer support and locally generated interventions for people with self-harm behaviours in correctional facilities identified only 1 RCT, and was similarly unable to draw strong conclusions about effectiveness (Winicov, 2019).

### *Synthesis and implications for Aotearoa*

Similar to other target population groups, evidence for initiatives amongst prison populations is limited and mixed. Reliance on screening and risk assessment has been highlighted as having limited yield, and a high quality review by Australian colleagues suggests that addressing factors unique to the incarceration experience, while also addressing life events associated with elevated suicidal distress, and taking care of both those who are incarcerated and those who provide care for prisoners, is essential (Barker et al., 2014). Prisons are complex environments, so no single intervention is likely to reduce rates of suicidal behaviour. Reviews indicate there may be some promise for CBT and peer support (Ekanem & Woods, 2021; Winicov, 2019), but conclusions are limited by low study quality and the absence of long-term follow-ups. There is an urgent need to examine the goodness of fit for some of the therapeutic approaches used for Māori and Pacifica who are over-represented in the incarcerated population.

### *Psychiatric in-patients*

The efficacy and utility of various types of interventions have been investigated for in-patient settings, including psychotherapies (Nawaz, Reen, Bloodworth, Maughan, & Vincent, 2021; Timberlake, Beeber, & Hubbard, 2020; Yiu et al., 2021), pharmacotherapy (Navin, Kuppili, Menon, & Kattimani, 2019; Timberlake et al., 2020), and environmental modifications to ward environments (Kiley, Volpe, Schenkel, & DeGrazia, 2020; Navin et al., 2019; Sakinofsky, 2014; Timberlake et al., 2020; Zhang, 2021). These reviews emphasised staff training about suicide prevention, improving staff to patient ratios, optimising patient visibility, conducting regular safety checks and monitoring on the wards and also while patients on leave. There is relatively limited literature on the efficacy of constant observation despite its common usage within ward environments (Kiley et al., 2020; Navin et al., 2019; Sakinofsky, 2014; Timberlake et al., 2020; Zhang, 2021).

The evidence for psychosocial interventions and pharmacotherapy approaches in general settings has been reviewed in other sections and is supplemented here by selected reviews in in-patient settings (Navin et al., 2019; Nawaz et al., 2021; Timberlake et al., 2020; Yiu et al., 2021). The most recently conducted systematic review found psychosocial interventions did not significantly differ from treatment as usual, enhanced usual care or active control interventions in reducing suicidality inpatient settings (Yiu et al., 2021).

### *Synthesis and implications for Aotearoa*

Overall, the strongest evidence base for suicide prevention in psychiatric in-patient settings is the use of ward environment modifications, such as staff training, increasing staff to patient ratios, optimising patient visibility and conducting regular safety checks and monitoring both inside and outside the ward (Kiley et al., 2020; Navin et al., 2019; Sakinofsky, 2014; Timberlake et al., 2020; Zhang, 2021). These ward/unit design and staffing matters are important in Aotearoa given the current Mental Health Infrastructure Programme (Ministry of Health, 2021a) to design and build a number of new inpatient psychiatric facilities around the country and have been noted both by suicide prevention researchers in New Zealand (Jenkin et al., 2022), the Ombudsman (see [here](#), for current reports) and by a number of Coronial findings. Further research is also needed to compare different models of care in inpatient settings (Kiley et al., 2020; Timberlake et al., 2020; Zhang, 2021) and the potential efficacy of psychotherapy approaches which are tailored specifically to addressing suicide in in-patient settings (Yiu et al., 2021).

### *Military, soldiers, and veterans*

Research on suicide prevention initiatives for active military personnel and veterans have included a wide range of intervention approaches such as mindfulness (Chesin et al., 2016; Raj et al., 2021), ACT (Tighe, Nicholas, Shand, & Christensen, 2018), CBT (Gotzsche & Gotzsche, 2017; Rostami, Rahmati-Najarkolaei, Salesi, & Azad, 2021; Rozek et al., 2021), DBT (DeCou et al., 2019; Rozek et al., 2021), social support (Hou et al., 2021; Kia et al., 2021), Collaborative Assessment and Management of Suicidality (CAMS) (Swift et al., 2021), risk assessment (Bernert et al., 2020; Burke et al., 2019; Carter et al., 2017; Nelson et al., 2017; Nuij et al., 2021; Woodford et al., 2019), safety planning (Ferguson, Rhodes, Loughhead, McIntyre, & Procter, 2021; Nuij et al., 2021), staff training (Harmon, Cooper,



Nugent, & Butcher, 2016), and multi-component interventions (Harmon et al., 2016; Witt et al., 2017a).

Reviews support the use of safety planning interventions for preventing suicidal behaviour in veterans (Ferguson et al., 2021; Nuij et al., 2021); however, no evidence was found for reduction in suicidal ideation. CAMS was used as a model of care for active duty military and veteran samples and was more effective in reducing suicidal ideation than suicidal behaviours (Swift et al., 2021). Brief-CBT has been illustrated to be effective in reducing suicidal behaviour, with smaller effects shown for suicidal ideation (Rostami et al., 2021). As previously noted the findings for risk assessment mirror the earlier section, and despite the large amount of data known about serving personnel and veteran populations, risk prediction approaches generally still suffer from poor predictive ability (Carter et al., 2017; Nelson et al., 2017; Woodford et al., 2019).

More complex multi-component interventions have been developed and evaluated for these populations (Harmon et al., 2016; Witt et al., 2017a); in a review of prevention programmes across military and emergency employees, common interventions were awareness training, crisis intervention, mental health surveillance using routinely collected data, peer support, employee wellbeing programmes, and postvention support. A robust review suggested that these programmes were associated with an approximate halving of suicide mortality rates over an average follow-up period of 5.3 years (Witt et al., 2017a).

### *Synthesis and implications for Aotearoa*

Overall, multi-component and organisational interventions show promise in decreasing suicide rates (Harmon et al., 2016; Witt et al., 2017a) and suicide-specific psychotherapy (Rostami et al., 2021; Rozek et al., 2021) and safety planning approaches show evidence for reducing suicidal behaviour in defence force personnel and veterans (Ferguson et al., 2021; Nuij et al., 2021). However, most reviews noted the low methodological quality of included studies. Most of this work has been conducted in the USA, and applicability to Aotearoa New Zealand has not been investigated. While active military personnel in Aotearoa New Zealand have access to support services as part of their employment, veterans do not currently have tailored health or social support services. The suicide prevention needs of veterans in Aotearoa are largely unknown, complicated by a lack of visibility (for example registering veteran status is an opt-in process). The NZ Defence Force is made up of more

than 15,000 personnel of whom 80% are male and 18% Māori ([Office of Auditor General, 2023](#)) making this an area where an equity focus is required.

### *Refugees and displaced persons*

In refugee and other displaced populations, evidence is limited for effective interventions, primarily due to poor study design (Haroz et al., 2020). Most interventions included in a review of displaced populations combined two or more prevention strategies, with the majority focused on training health workers or other community members/gatekeepers to improve identification and assistance to people at risk of suicide. Other common strategies include raising awareness to increase help-seeking and identification, targeting individuals following a suicidal act (e.g., self-injurious behaviours, attempts), and targeting subgroups of the population considered at increased risk. Although constrained by poor study quality, the most robust evidence of effectiveness to date is for brief interventions and safety planning (Haroz et al., 2020).

### *Synthesis and implications for Aotearoa*

Overall, the evidence for refugee and displaced population is limited, with some promise for brief interventions and safety planning (Haroz et al., 2020). In Aotearoa, settlement programmes are available in the immediate transition to the country, however, we do not have an organised system of specialised education, mental or physical health support for refugees. The suicide prevention needs of these groups in Aotearoa is largely unknown, but given their life experiences is likely to be significant and should be culturally and linguistically responsive.

### *People experiencing homelessness*

There is an absence of evidence for effective suicide prevention for people experiencing homelessness. An all-age scoping review of RCT's (Murray et al., 2021) included a HOPE family intervention made up of weekly meetings, intensive efforts to enhance family support, communication, and managing stressful situations with participants indicating no suicidal ideation at the end of the intervention. Collaborative Assessment and Management of Suicidality (CAMS) intervention focused on improving clients' reasons for living over 3-13 sessions and a health education and Cognitive Therapy for Suicide Prevention (CTSP, 10-19 sessions) were also described (Murray et al., 2021). This scoping review did not include a meta-analysis, so firm conclusions are difficult.

### *Synthesis and implications for Aotearoa*

While interventions to strengthen social or whānau networks, CAMS and cognitive therapy are describe in one scoping review as showing some promise, these studies have mainly been conducted in the USA, so the relevance for people experiencing homelessness in Aotearoa is unknown. From an equity perspective, there is a strong need to address the key social determinant of poverty which is associated with both homelessness and suicide.

#### *People with diagnosed mental health conditions*

Amongst people with diagnosed mental health conditions, including depression, anxiety, psychosis, and personality disorders, there is mixed evidence for the efficacy of psychotherapy and pharmacotherapy interventions on suicide prevention.

In depressed patients, there is little evidence to suggest that psychotherapy (including CBT, mindfulness, and psychodynamic approaches) is sufficient to reduce suicidality (Cuijpers et al., 2013). A more recent review included a broader range of interventions for those with treatment resistant depression and found no difference in the incidence of attempted suicide following deep brain stimulation, vagal nerve stimulation, or ECT in a meta-regression analysis (Bergfeld et al., 2018).

For those experiencing early or first-episode psychosis (Bornheimer, Zhang, Li, Hiller, & Tarrier, 2020) and schizophrenia (Donker et al., 2013), there is some evidence that psychosocial interventions (including CBT and motivational interviewing) may have positive outcomes. However, the benefit of these interventions over and above that of treatment-as-usual or a control condition is not clear (Donker et al., 2013). More recently, a meta-analysis by Bornheimer and colleagues (2020) suggested that participants with first-episode psychosis who received psychosocial interventions were less likely than controls to report suicidal ideation, suicide plan, and attempt or die by suicide (OR=0.57, 95% CI =0.41–0.78) (Bornheimer et al., 2020., p.829).

People with Post-Traumatic Stress Disorder (PTSD) and Borderline Personality Disorder (BPD) have high rates of suicide. For adults diagnosed with BPD, there is some evidence to suggest that DBT has positive effects on self-harm, but not on suicidal ideation; a recent meta-analysis showing that DBT reduced self-harm behaviours (SMD = -0.28, 95% CI -0.44, -0.12) and depression, but not suicidal ideation (SMD = -0.26, 95% CI -0.74, 0.21) (Chen, Cheng, Zhao, & Zhang, 2021b). For those with PTSD, treatments for PTSD tended to

reduce both PTSD and suicide related outcomes and the addition of treatments focusing on suicide tends to result in a similar pattern of improvement, with generally low rates of adverse outcomes (Rozek et al., 2021).

#### *Synthesis and implications for Aotearoa*

Given the high incidence of suicide and suicide attempts in those with diagnosed mental health conditions, the ongoing investigation of interventions for these groups is warranted. In Aotearoa, we need more thorough evaluation of interventions currently being offered, particularly to groups of people in which there is limited international evidence of effectiveness.

#### *People with diagnosed physical health conditions*

Few reviews of evidence for effective interventions with those with physical health conditions were identified, with only one review focusing on people diagnosed with cancer where suicide related outcomes were incorporated as secondary outcomes in the included trials. This is an important population, who are thought to have suicide incident rates twice that of the general population. However, these studies showed little evidence of benefits on suicide-related outcomes among cancer patients, most likely because the interventions targeted depression, and a number of included studies excluded those with suicidal distress (Kawashima et al., 2019). An older review of ehealth interventions included one study conducted among people living with HIV however, a lack of control meant that they were unable to determine whether screening and referral to an intervention alone was sufficient to improve help-seeking and suicide related behaviours (Christensen et al., 2014).

#### *Synthesis and implications for Aotearoa*

Suicide prevention research amongst people diagnosed with physical health conditions is severely lacking. Similarly, to people with diagnosed mental health conditions, it is likely interventions need to specifically targeting suicidality in these populations over and above support for their underlying mental health or physical health condition/s.

### **6. Level of Intervention: Multilevel Interventions**

Multilevel interventions target several populations or several levels within systems, such as public health or primary care. Several, high quality reviews suggest that a coordinated,

synergistic approach to suicide prevention, across all levels of intervention (i.e., universal, selective and indicated) is likely to be necessary to reduce suicide (Altavini et al., 2022) (Hofstra et al., 2020). Building on an earlier, influential review which outlined the elements of best practice for multilevel interventions (van Der Feltz-Cornelis et al., 2011), an updated systematic review (16 studies,  $n = 252,932$ ) and meta-analysis (15 studies,  $n = 29,071$ ) investigated intervention studies published between 2011 to 2017 where suicide attempts and death by suicide were the primary outcome of interest (Hofstra et al., 2020). The included interventions ranged from talking therapies, to safety planning, reducing access to pesticides, brief intervention/contacts and gatekeeper training. The meta-analysis suggested there was overall a large preventative effect of suicide prevention interventions on deaths by suicide ( $d = -0.535$ , 95% CI  $-0.898, -0.171$ ,  $p = .004$ ), with a moderate effect on attempted suicide ( $d = -0.449$ , 95% CI  $-0.618, -0.280$ ),  $p < .001$ ). Interventions delivered in psychiatric wards of general hospitals showed the largest effect on preventing deaths by suicide. A small, non-significant effect was observed for ED based interventions ( $d = -0.289$ , 95% CI  $-1.082, 0.503$ ,  $p = .474$ ) with no evidence that interventions delivered in outpatient mental health settings reduced deaths by suicide ( $d = 0.088$ , 95% CI  $-0.655, 0.831$ ,  $p = .817$ ). In contrast, outpatient settings showed the largest effect size for reducing suicide attempts, followed by psychiatric wards, community settings and emergency department settings. Multilevel interventions, defined by the authors as containing suicide prevention activities in different settings, different domains and by different providers, were more effective than non-multilevel interventions in reducing both suicide attempts and death by suicides. There was also evidence to support synergistic effects with increasing levels of activity (three levels was the maximum included) (Hofstra et al., 2020).

A recent review of reviews including universal prevention initiatives in non-clinical adult populations up to July 2021 across 32 systematic reviews highlights that general population universal interventions tend to be a single intervention, whereas studies focusing on specific populations tend to include multiple components, such as a combination of means restriction, mental health promotion and gatekeeper training (Altavini et al., 2022). These authors concluded that the single interventions of restricting access to methods and media reporting guidelines were effective. Gatekeeper training to improve knowledge as part of a multicomponent intervention was viewed as helpful rather than having a direct, measurable effect on suicidal behaviours. Multicomponent interventions had the greatest evidence for effectiveness when implemented with specific populations in specific contexts such as

workplaces with emergency services, military and police personnel compared with general population programmes (Altavini et al., 2022).

Reviews have also shown promise for other multilevel initiatives implemented with specific populations or within specific settings. A recent selective systematic review, without meta-analysis, (Mann et al., 2021) of 97 RCT intervention studies and 30 epidemiological studies (conducted between 2005-2019) highlighted General Practitioner (GP) education to screen and treat depression, assertive outreach after attending hospital following self-harm, and firearms control as effective interventions. This review concluded that the results of youth education interventions were mixed, with stronger evidence for educating youth about mental health, than adults in the education setting (Mann et al., 2021). Additionally, in a review restricted to interventions that measured death by suicide as an outcome measure in adults, the WHO Brief Intervention, an enhanced care model with structured information session close to ED presentation, and nine sessions of follow-up over an 18 month period, with additional onward referral where indicated, were shown to be effective in preventing suicide (Riblet, Shiner, Young-Xu, & Watts, 2017).

In terms of evaluating the cost-effectiveness of such multilevel approaches, Feldman and colleagues found in their review of public health interventions that two of four suicide prevention interventions identified were cost effective, one for school students (although not all elements were cost effective) and one for those bereaved by suicide (Feldman, Gebreslassie, Sampaio, Nystrand, & Ssegonja, 2021).

While multilevel interventions appear to be promising (Zalsman et al., 2016) and intuitive as an approach, it also needs to be recognised that even a perfectly designed multilevel programme, delivered with true fidelity will have some limitations. Kyrinska and colleagues demonstrated this by estimating the population preventable fraction (PPF) of range of evidence-based multilevel approaches in Australia. The PPF of an intervention estimates the extent to which suicide attempts and deaths would be reduced if each of the interventions was fully implemented with true fidelity. The PPF's were based on literature for the risk ratio for each intervention as described in two reviews (Mann & Michel, 2016; van Der Feltz-Cornelis et al., 2011). Prevalence estimates were assessed for each component of the proposed systems approach: reducing access to suicide means by self-poisoning, media guidelines, public health campaigns using flyers, gatekeeper programmes in workplaces, school programmes, general practitioner training, psychotherapy by increasing access to mental health care and

co-ordinated/assertive aftercare of those who attend hospital following self-harm (Krysinska et al., 2016). Some of these estimates have potentially been superseded by subsequent studies of particular interventions, but this review highlights likely gains for reducing access to methods of suicide and modest, but worthwhile gains other approaches.

Lastly, it is also important to frame the promise of multilevel approaches within the current climate. Amongst the rise of the Coronavirus of 2019 (COVID-19) pandemic, there was an initial concern that suicide rates would increase with rising uncertainty, disruptions, and flow-on effects challenging wellbeing (Gunnell et al., 2020). However, two prominent studies (Pirkis et al., 2022; Pirkis et al., 2021) show most countries observed either no change to suicide rates or a decrease. However, while this is more promising than originally predicted, delayed effects of a global pandemic, such as rising inflation and predictions of recessions, means that cautions for such increases should not be discarded and multilevel interventions, including macro-economic, will likely play an important role in prevention in the next decade or so.

#### *Synthesis and implications for Aotearoa*

Co-ordinated, synergistic multilevel approaches have been illustrated to be likely effective in reducing suicide (Hofstra et al., 2020). The highlighted reviews above suggested multiple initiatives involved in multilevel approaches such as, means restriction (Altavini et al., 2022; Hofstra et al., 2020; Krysinska et al., 2016; Mann et al., 2021), media reporting guidelines (Altavini et al., 2022), repeated GP education, follow-up contact and assertive outreach following hospital admission for self-harm (Mann et al., 2021), and brief interventions (Riblet et al., 2017). Conclusions are limited by mixed fidelity and heterogeneity of outcome measures, and there is a need to examine more closely the efficacy of combination approaches as well as evaluating the efficacy of each component (Altavini et al., 2022; Hofstra et al., 2020; Mann et al., 2021).

## Postvention

Suicide postvention is an important element of suicide prevention given the elevated rates of suicide among those bereaved by suicide. In reviews where all intervention types were included, the sample of postvention studies were generally small, highlighting a paucity of information about effectiveness.

### **1 Level of intervention: multilevel**

Colleagues in Australia (Andriessen, Krysinska, Kolves, & Reavley, 2019b) have reviewed postvention best practice, however the definition used focuses on bereavement support, which is a narrower definition than the wide range of activities which typically occur under a postvention ‘umbrella’ here in Aotearoa. A postvention response should include a range of interventions which are flexible, and responsive to the specific context, and are likely to include provision of help for those affected by suicide, or self-harm, proactive engagement with media interest, guidance for organisations connected with the deceased, such as education or workplaces, marae, encouraging adherence with safe media reporting guidelines and bereavement support. Social media can be positively employed as a means for disseminating information and reaching young people at risk (Hawton et al., 2020), however this will also require monitoring to reduce social media as a vector of further contagion.

Suicide clusters account for a relatively small proportion of deaths, so most postvention activities occur outside of suspected or confirmed clusters. However, due to the impact of contagion on families and communities, this is an important area of suicide prevention. We identified one review (Hawton et al., 2020) that examined effectiveness of strategies for containing suicide clusters, which concluded that interventions in this area are still evolving and current approaches are largely based on good practice derived from experience. The identification of clusters, or other variations can be difficult, particularly in smaller communities due to the low base rate of deaths by suicide. Effective detection of clusters, or other variations, requires ongoing real-time surveillance of suicidal behaviour. Real time surveillance is a complex activity requiring cross sectoral (e.g., Police, Coroners, Health) cooperation, compatible data systems, strong governance, cultural support, suicide prevention epidemiologists and strong relationships across the suicide prevention and postvention sector. Real time surveillance requires stable funding and robust support (including psychological support) to all those involved in the surveillance system and postvention responses (Benson et al., 2023).



## **2 Level of intervention: universal**

None

## **3 Level of intervention: selective**

As noted above, Karl Andriessen and colleagues recently reviewed a range of suicide postvention service models and guidelines. This group reported mixed evidence as each of these programmes had a range of outcomes with only some showing positive impacts (Andriessen, Krysiniska, Kølves, & Reavley, 2019c). Despite the limited evidence of effectiveness of postvention interventions (mainly due to paucity of high-quality research), the review identified some of the potential effective programme components such as - distinction between help offered to all individuals and help for those with higher levels of grief or mental health symptoms. Grief specific interventions, delivery of interventions that acknowledges a continuum of grief with intervention offered according to the differing needs for postvention intervention (universal e.g. informal social support for all; selective – peer support; and indicated-psychotherapy for those who are highly distressed); peer support and involvement (providing and receiving) with trained volunteers working alongside mental health professionals, involvement of wider community, interventions offered over time and use of manuals or guidelines.

A review of controlled studies of grief and suicide-related outcomes indicated some evidence of the effectiveness of interventions for uncomplicated grief but not for complicated grief. There is also lack of evidence regarding which intervention modalities delivered in particular settings, such as schools, participants' own homes or clinical settings, are most helpful for suicide survivors across a range of demographic profiles. Despite the limited evidence, promising interventions include supportive, therapeutic and educational approaches, involvement of the social environment of the bereaved, sessions led by trained facilitators (Andriessen et al., 2019c). Similarly an older review reported variability in the effectiveness of interventions in reducing complicated grief (Linde, Treml, Steinig, Nagl, & Kersting, 2017).

Peer support is one of the widely discussed interventions for postvention; however, few reviews have evaluated such interventions. A recent review of peer support programmes for those bereaved by suicide concluded that most programmes did not report data on effectiveness, signposting workforce development requirements regarding programme

design, implementation, evaluation and rigour in reporting (Schlichthorst et al., 2020). The effectiveness support groups for children and adolescents who had lost a close relative to suicide was similarly unable to demonstrate an effect (Journot-Reverbel, Raynaud, Bui, & Revet, 2017). However, a review of interventions for bereaved survivors of sudden or unexpected death, and reported some evidence that peer support from fellow suicide survivors, irrespective of mode of delivery, was beneficial in terms of reducing grief symptoms, and suicidal thinking (Bartone et al., 2019).

A review of effectiveness of community-based support for people affected by suicide reported preliminary support for these interventions in enhancing psychological adjustment, reducing suicide-related behaviour, and improving caring ability among those affected by suicide. Key ingredients appeared to be face-to-face support and connecting with others with lived experience (Finlayson-Short et al., 2020). A second review examined the effectiveness of online resources, which included online support groups, online memorials, Facebook and PDF's of resources. The authors suggested that women, those in their middle years, recently bereaved and parents who had a child die by suicide were particularly likely to use these resources, and there may be promising effects on the mental health and psychosocial health of participants, particularly for those who were more socially disadvantaged and isolated (Lestienne, Leane, Haesebaert, Poulet, & Andriessen, 2021). A review of art-based interventions for suicide prevention and survivorship included a single study of people bereaved by suicide. The intervention involved creating memorial quilts to reduce social judgements and stigma, which limited opportunity to grieve (Sonke et al., 2021).

Leaders in this area of prevention suggest that development of a 'core outcome set' for suicide bereavement interventions (Andriessen et al., 2019c) and greater evaluation of the effectiveness of peer support approaches for bereaved survivors are important next steps (Bartone et al., 2019; Schlichthorst et al., 2020).

### *Synthesis and implications for Aotearoa*

It is possible that suicide postvention activities in Aotearoa New Zealand are world leading. However, there is much work to be done to ensure that postvention systems are well established, with robust data sharing and governance structures, supported by real time surveillance of self-harm and suicide, and have Te Tiriti at the centre.

Grief interventions designed for those bereaved by suicide have been recently established in a national approach, but will need to include a sufficient number of sessions over a sufficient length in time to align with the evidence outlined above. Current government funded bereavement interventions only offer four funded sessions which may be insufficient for the complexity of grief after a death by suicide.

## **Indigenous peoples**

### **International evidence:**

Several reviews examining suicide prevention interventions in indigenous populations have been identified. However, most of the included trials in these reviews focus on risk and protective factors or conceptual frameworks but offer limited information regarding interventions and their effectiveness in prevention of suicide or suicide related behaviours.

We found two reviews regarding suicide prevention interventions in circumpolar north (Pollock et al., 2020; Redvers et al., 2015). Both of these reviews highlight policy and service-specific initiatives such as having a national suicide prevention strategy for Inuit, Sami, Alaskans and Greenland, and emphasised the local and cultural contextualisation of the interventions. A collaborative inter-governmental response to identify the most important suicide prevention outcomes for indigenous communities - Reducing the Incidence of Suicide in Indigenous Groups—Strengths United through Networks (RISING SUN Initiative) has established to identify primary outcomes, measures and best practice from the region, but do not report detail on interventions or their effectiveness.

We identified reviews specifically focused on suicide prevention interventions for indigenous populations in USA, Canada, Australia and New Zealand (Harlow, Bohanna, & Clough, 2014; Hatcher, Crawford, & Coupe, 2017; Leske et al., 2020). Overall, these reviews strongly endorsed the incorporation of indigenous knowledge, worldviews and cultural practices into suicide prevention interventions. Leadership, collaboration or direct involvement with indigenous people was identified as critical to success.

A narrative synthesis of suicide prevention among Inuit in Canada emphasised inclusion of cultural knowledge and practices such as listening to advice from elders, pipe ceremonies, powwow dances and fasting camps (Kral, 2016). Similar recommendations were made by Harlow et al. (2014), who reviewed suicide prevention for indigenous youth and identified

strong community development and involvement as promising (Harlow et al., 2014). Hatcher et al., (2017) also suggested that institutions and researchers need to accept the role of indigenous knowledge in the content and control of strategies, and engage with indigenous peoples as collaborators as well as participants at all levels of research design, analysis, data ownership and dissemination of results (Bartone et al., 2019; Hatcher et al., 2017). On balance these reviews appeared to privilege Western, often psychiatric interventions with suggestions for cultural adaptations rather describing interventions developed or privileging an indigenous world view.

A review of programmes for Australian Aboriginal and Torres Strait Islander communities suggested that programmes delivered by non-indigenous tended to be more individualistic and treatment oriented while indigenous-led interventions tended to be more holistic and community focused (Ridani et al., 2015). This review highlighted a whole of community approach focusing on connectedness, belonging and cultural heritage using creative arts such as photography, theatre, cultural camps and performances. Programme evaluation included process outcomes but a lack of suicide related outcomes limited conclusions about programme effectiveness (Ridani et al., 2015).

An important review of indigenous suicide prevention interventions, spanning 24 studies from Australia, Canada, New Zealand and USA, (14/24 before-after studies, 4/24 RCT's, 3/24 n-RCT's, 2 interrupted time-series and a cohort study) reported that decreased suicide deaths in four studies and decreased in suicide attempts in six studies. This review identified that youth (12/24) were the most common population of interest, using selective interventions (13/24 studies) with 5/24 studies whole populations or communities. Three studies had universal, selective and indicated interventions operating at the same time. This review concluded there was some evidence of reduced suicides associated with alcohol control policies as part of comprehensive, multilevel interventions. For suicide attempts, there was also limited evidence favouring multilevel programmes (Leske et al., 2020). This review also highlighted the continued use of a western psychiatric lens for outcome measures that do not align with the community. The authors suggested indigenous derived outcome data is an important area for further development (Leske et al., 2020).

A review of the effectiveness of gatekeeper trainings for indigenous suicide prevention interventions in the USA, Canada and Australia and indicated lack of culturally appropriate

gatekeeper programmes, that are specific for Indigenous people with appropriate evaluation (Nasir et al., 2016).

Overall, these reviews highlight the continued use of a western psychiatric lens for both interventions and outcome measures for published indigenous suicide prevention interventions. There is an urgent need to privilege an indigenous world view and to develop significant improvements in study design and evaluations to generate evidence about what works in indigenous suicide prevention.

### **Suicide Prevention Interventions delivered in Aotearoa New Zealand focusing on the general population**

We found a diverse range of evidence for suicide prevention interventions in Aotearoa New Zealand, the majority of which is based on evaluations of community activities rather than methodologically rigorous research studies. This project is not a stocktake of current suicide prevention activities, but a synthesis of evidence so we address these findings below.

#### *Aotearoa New Zealand suicide prevention interventions for all populations*

Collings and colleagues conducted a cluster RCT to assess the effectiveness of a multilevel intervention that included training in recognising risk factors of suicide (QPR New Zealand adaptation), workshops on mental health topics, community-based interventions such as linking with community events, and the dissemination of suicide prevention information including web-based resources. The study included four pair of DHBs, it could not establish substantial evidence regarding effectiveness of these interventions in reducing suicidal behaviours. This study highlights the need for more robust outcome data, particularly the challenges of using routinely collected data as primary outcome measures in trials in New Zealand (Collings et al., 2018).

An earlier comparative evaluation commissioned by the Ministry of Health, of two approaches to gatekeeper training, ASIST in person workshops and QPR Online identified advantages and disadvantages of each programme and mode of delivery. Participants raised concerns about perceived personal and cultural safety, particularly for ASIST (Oliver, Spee, Akroyd, Wolfgramm, & Ignite Research, 2015). It is not clear whether the current offerings of ASIST in New Zealand have been modified in respect of these findings.

A small open trial of Problem Solving Therapy for Young People at risk of self-harm in New Zealand showed statistically and clinically significant reduction in depression and suicidal behaviour between pre and post intervention. The highlighted the feasibility and acceptability of a client workbook and training content (although not the training delivery) (Blackett, 2014). A qualitative interview study where participants had lived experiences of suicidality in New Zealand aimed to identify interventions that participants found helpful. Art therapy, practising mindfulness, certain medications and spirituality were described as effective by study participants (Ali, 2019).

Mates in Construction is an industry-based prevention programme delivered in the construction industry in New Zealand. This approach builds on work in Australia and includes a range of interventions including ASIST. A recent evaluation published by MATES suggested that participants rated their knowledge and intention to seek help more positively after participation in this programme, although there was an increase in the number of participants who said they would seek help from ‘no-one’ after participation. This programme appeared more effective for female compared with male participants. It is not possible to establish whether or not these effects are maintained over time given that only 3.2% of those who participated in the training completed a follow-up survey (Wilson et al., 2021a).

A review of the [Australian and New Zealand Clinical Trials Registry](#) indicates there are a number of important studies underway, which will further inform our understanding of what suicide prevention interventions may work in the local context. Of particular interest are: two projects by Dr Emily Cooney on DBT offered to [adolescents](#) and another within the [Kaupapa Māori Family Violence Prevention Service](#), an evaluation of [mental health co-response teams](#) by Police, Ambulance and Mental Health services led by Dr Kuehl, two projects examining use of apps to enhance [social support](#) and [youth health assessments](#) led by Dr Hiran Thabrew, and an RCT of interventions to enhance [post-training effectiveness of gate-keeper training](#) led by Denise Kingi-Uluavae.

To date there is no publicly available information at this time about the effectiveness of a mass media campaign targeting men delivered at the end of 2020, called [Man Enough](#). Zero Suicide, a systems approach to suicide prevention in mental health services, has been adopted by some health providers and future evaluations of this approach are of interest.

*Aotearoa New Zealand suicide prevention interventions for Māori and Pacific Populations*

To the best of our knowledge, only one RCT has examined effectiveness of a culturally informed treatment compared to TAU among Māori who present to hospital after SH. The trial included participants from 7 hospitals in 3 DHBs (Waitemata, Counties Manukau and Northland). The culturally informed package of care, included sending postcards over a year, the offer of brief problem-solving therapy, telephone-based patient support, vouchers for free GP services with emphasis on physical health checks and ensuring registration with a GP, a systemic approach to identifying and managing modifiable risk factors in the patient, and a cultural assessment focused on sense of belonging. The study reported some positive findings as Māori who received the intervention were less likely to re-present with SH to hospital at 3 months but not at 12 months compared to the control group (Hatcher et al., 2017).

A narrative review of successful initiatives for suicide prevention among Māori men across NZ (n=21) indicated a relative absence of initiatives focussed specifically on Māori men. The included studies highlighted use of a more holistic outlook with emphasis on whānau based initiatives and whakawhanaungatanga. The review recommended that future interventions should be responsive to the needs for tane Māori. Further, initiatives to enhance cultural identity, open communication, tāne specific modes of engagement, and the development of new 'strengths' show promise of being useful in building resiliency among tāne Māori (Waiti, 2016). A smaller project examining the role of traditional Māori practices as interventions for Rangatahi experiencing suicidal distress from the perspective of Māori clinicians concluded that three critical whakaaro that can assist rangatahi Māori wellbeing are healing as a whole, protecting with wairua and self-healing (Gemmel, 2020).

Women's Refuge in Waikato reported a suicide-free environment for more than 30 years (Jones, 2017). Staff interviews suggested this was achieved by privileging Māori worldviews and practices of tīkanga, mā te whakarongo and kōrero (listening and talking), awhi (support), redirecting the focus, and whakamana (to empower). Staff responded to clients using manaakitanga (to care for, show respect), aroha (show love, empathy), awhi, both physical and emotional support, and whakawhanaungatanga.

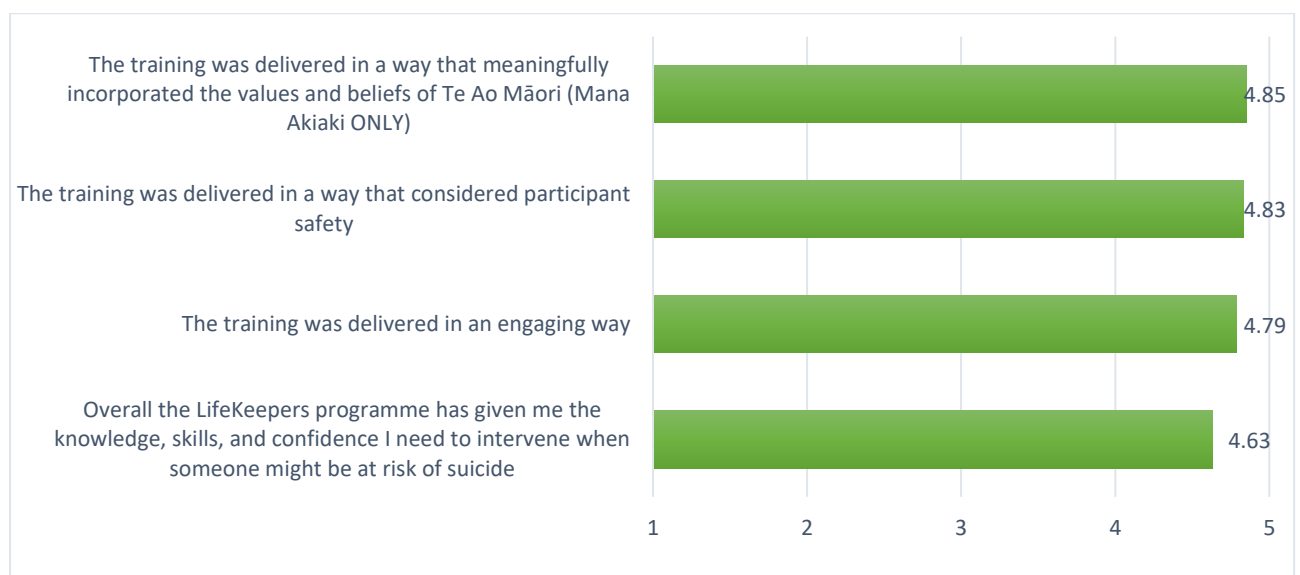
#### *Aotearoa New Zealand suicide prevention programme evaluations for Pacific communities*

Pacific suicide prevention activities in New Zealand are led by Le Va and cover a range of programmes initially delivered as part of Waka Hauora, a Māori and Pacific suicide prevention programme in partnership with Te Rau Ora. Programmes include FLO, Life Keepers and Mana Akiaki (gatekeeper training programmes), Auntie Dee (problem solving),

Mental Wealth (mental health literacy) and more recently Mana Restore. Culture, clinical safety and community development area described by Le Va as central principles of their work in suicide prevention. The aims of FLO are to equip Pacific communities with knowledge, tools and education about suicide prevention, to inform the sector with research and evidence-based information and to lead Pacific community prevention initiatives.

Le Va kindly shared data with the team writing this report; 194 people have engaged in the FLO Talanoa community intervention programme workshops with 100% endorsement by participants of enhanced knowledge and confidence speaking about suicide. More than 70,000 webpage hits have been recorded for Aunty Dee, an interpersonal problem-solving webpage with around 14,000+ users of the Aunty Dee tool. The Mental Wealth programme, has been delivered in more than 20 locations such as sports clubs, schools and secondary schools with 20,000+ webpage visits.

More detailed information regarding Life Keepers suggests that between August 2017 and August 2022, 13,622 people participated in Life Keepers training across three modalities. Self-report measures (from an unknown proportion of participants) suggest that those using the e-learning modules appear to have slightly higher pre-intervention knowledge, but all three modalities were associated with improvements on a five-point scale, the statistical significance of these results is not known. Participants reported generally high satisfaction with engagement and delivery of the programme.





In recognition of the need to develop a greater understanding of the relationship between knowledge and behaviour in suicide prevention Le Va are collecting information from participants about how they have been able to use the skills developed during Life Keepers; to date 2,094 Life Keepers have logged some behavioural contact, of whom 1,144 report intervention with a person they considered to be at risk of suicide and 944 have connected a person with additional support (personal communication, 2022).

A verbal summary description of the Pacific Suicide Prevention Community fund suggests there are aspects of promising practice, particularly for projects resourcing and upskilling families in problem solving and developing meaningful and intentional skill development with their loved one who is struggling with suicidal distress. This is an area of future further development.

Pacific communities have identified distinct needs for those bereaved by suicide. Findings from a mixed-methods study conducted across New Zealand highlighted the need for more Pacific-appropriate information, greater inclusion of Pacific workforce in suicide postvention (paid and voluntary), focus on Pacific ethnic-specific postvention initiatives as well as recognising Pacific diversity, establishing family support groups for postvention support rather than community support groups. The study findings also highlighted that both short and long-term support should be offered as there is no ideal time frame for recovery. Further, workplace was identified as an important site where postvention support should be made available (Tiatia-Seath, 2016).

#### *Aotearoa New Zealand suicide prevention programme evaluations for Māori communities*

In recent years there has been a significant investment in Māori community-based suicide prevention projects with a focus to provide culturally responsive suicide prevention interventions. There is some limited evaluation data available that has highlighted positive practices, although these outcomes are not specific to reductions in suicidal behaviour. A Kaupapa Māori outcomes framework has been published for evaluation of interventions and is outlined in more detail below. Readers are also directed to the outcomes framework developed for the previous national suicide prevention strategy ([Suicide Prevention Outcome Framework, 2015](#)).

The Kia Piki te Ora programme originated from the first national suicide prevention strategy, which focused on youth. KPTO is a by Māori for Māori programme that seeks to enable

collaboration between Māori whānau, community, hapū, iwi, and organisations grounded in tikanga Māori principles and practices. The programme emphasises Māori development with stated service specifications to promote mental health and wellbeing for Māori, engage with community and reduce access to methods of suicide. An evaluation of programmes offered in 2010-2013 concluded that the KPTO activities were making a positive contribution to Māori suicide prevention because they were tailored to the needs of the local community. This report noted that reducing access to means of suicide was inconsistently addressed (Andrews, 2015).

The Resilience project in Northland involved use of theatre to educate, and enhance professional development and develop community knowledge to build resilience by enhancing protective factors and reducing vulnerabilities of young people to prevent suicide. An independent evaluation found this approach created opportunities and confidence to talk about challenges commonly experienced by youth in the region. The programme helped youth to identify their support network of peers and adults. Community support networks gained knowledge and confidence in recognising youth in need and how to access services available locally (Penney & Dobbs, 2014).

A community development project 'Towards Mauri Ora': Entrepreneurship Education and Community Development for 'hard to reach' rangatahi and their whānau for adults aged 16+ years reported success in building communication within whanau, increasing appreciation, strengths within whānau and whānau based problem solving in three rohe Te Whanganui a Tara, Te Tau Ihu o Te Waka o Māui and Te Moana a Toi (Love, Lawson-Te Aho, Love, & Shariff, 2016).

Te Rau Matatini have identified Pou Ārahi - Māori leaders with mana to lead local suicide prevention in communities and they whakapapa with. Communities sought suicide prevention activities that emphasise their strength and a positive Māori identity (Baker, Sewell, Morris, McClintock, & Elkington, 2017).

To support the appropriate evaluation of indigenous suicide prevention interventions an outcomes framework and evaluation processes was published to support the Waka Hourua Suicide Prevention Programme (2014-2017). This framework included the following domains to support project success 1). informed, cohesive and resilient communities 2). strong, secure and nurturing whānau, 3). safe, confident and engaged rangatahi. The framework emphasised describing both quantity and quality of inputs, for example, number of resources developed

and their accessibility, and outputs, for example, resources accessed and plans completed (McClintock & McClintock, 2017). This framework was used to evaluate 47 community-funded projects spanning a range of interventions at different levels such as resources for the Takātapui community, ASIST, QPR and encouraging parental/whānau involvement in youth activities. For rangatahi, interventions included educational and activity-based programmes focusing on connection, hope, confidence, promoting help-seeking and creating an alcohol-free environment. Wānanga forums and strengths-based cultural learning are reported to have created positive experiences and confidence in engaging with extended whānau, hapū and iwi (McClintock & McClintock, 2017).

### *Annual Māori Suicide Prevention Symposia*

Two recent Māori suicide research symposia highlighted the limited effectiveness of clinical approaches for suicide prevention among Māori and concluded that healing must be anchored in reclaiming indigenous self-determination, whānau and community development.

Understanding emotions using traditional knowledge was identified as method of supporting Māori youth who self-harm. It was recommended that young Tane Māori should be provided an opportunity to discuss Māori masculinity, physical connection and engagement with their culture (marae, moana, awa, maunga and atea) and that matauranga provides for safe spaces to prompt and sustain meaningful conversation. For young Maori who identify as takatāpui, safe houses and reconnection with cultural identities and values were recommended (McClintock, 2019).

The outcomes report and recommendations from the second Summer School Symposium identified seven imperatives for Māori suicide prevention:

1. Whakaōti ngā hua o te Tāmitanga - eliminating the oppressive outcomes of colonisation for Māori and fully acknowledging all of the impacts of colonisation on Māori well-being and illuminating and addressing racism through story-telling.
2. Whakamana ō te Mātauranga Māori - valuing and utilising Māori intelligence for Māori suicide prevention through reconnecting with whakapapa/genealogy.
3. Hōnonga ki ngā Ātua Māori - connecting to te Wairua/Spirituality and embracing a Kaupapa Māori lens which elevates Māori experiences, cultural narratives and healing traditions in a way that advances Tino Rangatiratanga.
4. Whakamana te Mātauranga Māori/ Whakamana te Māramatanga Māori - developing and upholding Māori intelligence, wisdom, and research to be able to apply

knowledge that is meaningful and useful to whānau Māori is imperative for Māori suicide prevention and postvention.

5. Whakaōti aukati iwi - eliminating racism and ensuring the ongoing utilisation of the Waitangi Tribunal claims process as a counter to the failure of DHBs to implement He Korowai Ōranga.
6. Whakamana te Tiriti o Waitangi - developing policies that enable and realise Te Tiriti o Waitangi
7. Whakamana Whānau - the importance of ensuring that whānau are elevated and at the centre of suicide prevention and postvention efforts (Lawson-Te Aho & McClintock, 2020).

*Aotearoa New Zealand suicide prevention programme evaluations for Māori communities – Te Rau Ora*

A summary of research and evaluation shared by Te Rau Ora best practice evidence for Māori suicide prevention is understandably congruent the themes outlined above. Additional tabular data are outlined in Appendix C.

Te Rau Ora administer the Māori Suicide Prevention Community Fund of around \$1.6 million per annum with the aim of developing capacity of Māori whanau and communities to prevent and respond to suicide.

The elements of this approach are described by Te Rau Ora as:

*“Tiaki Whānau Tiaki Ora (Protecting Whānau, Protecting Life) is designed specifically to reach into whānau homes, and to build healthy whānau by increasing their awareness of risk factors of suicide and the strategies that will strengthen whānau resilience. The basis of the programme is Whānaungatanga and respectful information sharing rather than facilitator led presentations. Te Rau Ora’s primary objective in this approach is to enhance Whānau hauora and resilience around suicide and suicide prevention through Whānau Champions.*

*Manaaki Ora are a suite of Māori Suicide Prevention and Postvention Training options delivered by Te Rau Ora. Culturally responsive ways of working are important when working with whānau Māori. The long-term effects of working in a culturally sensitive and centred way affirms that culture, values, and practices are important to Māori wellbeing especially when ones identity is recognised and visible in one’s approach. Manaaki Ora is a*

*series of cultural wānanga developed for the prevention and reduction of suicide for Māori, that privileges Te Ao Māori and works from a strengths and whānau centred basis.*

*Rangatahi Ora focus on the specific needs of Māori Rangatahi. In 2017, Te Rau Ora launched Te Kahui Ururoa National Youth Council with the aim of providing a national group of Rangatahi to advocate for young people at risk of suicide. Since then Te Rau Ora has created a range of spaces to support Rangatahi Māori and various initiatives (e.g. Au.E!, Change Makers, Tu Kotahi). Often schools, Kura Kaupapa and rangatahi focused programmes will seek out Te Rau Ora for Kaupapa Māori solutions to aid in suicide prevention and postvention strategies”*

Te Rau Ora kindly shared perspectives on successful aspects of the Tiaki Whānau Tiaki Ora programme and report that the engagement and recruitment of whānau champions is particularly promising utilising a tuakana/teina model:

- *“Intentionality by whānau champions to create time and opportunities from a te ao Māori perspective to discuss the kaupapa and allow whānau time to reflect about their lives, loved ones and wellbeing*
- *That the programme is whānau focused and not programme focused*
- *Programme design and content is whānau centred – use of wānanga, active listening, making the kaupapa about whānau*
- *Programme facilitators – expertise, well educated, good facilitators, supportive*
- *Gaining increased understanding of suicide prevention, increased skills and self-efficacy*
- *Relevant, useful and effective resources, programme support” (Personal communication, 2022).*

Challenges identified by Te Rau Ora for whānau champions are *“mostly about engaging whānau first-up, having confidence to know where and how to start the conversation, and gaining their trust when whānau feel very mamae to talk about suicide matters and loss. These were things that they got better with over time. Other challenges like capacity and time to engage with whānau and traveling long distances to meet whānau were matters that required more effort”*.

Verbal feedback on current community funded suicide prevention initiatives suggested that activities focusing on whānau are the most powerful, with a strong outward ripple effect experienced by those who participate in activities such as wananga. Te Rau Ora also described success in connecting with Tane Māori. In addition, the following information has been shared by Te Rau Ora

*“Thirty-one initiatives funded by the Māori Suicide Prevention Community Fund have received multi-year funding. Seventeen of these initiatives received funding in 2020 and 2021, nine received funding in 2021 and 2022 and five received funding in 2020, 2021 and 2022. Eleven initiatives from the whānau/hapu category have been funded for more than one year, and six initiatives from the Māori Community Groups have also been funded multi-year. There are two initiatives from the Iwi and Māori Providers category that have received multi-year funding and one initiative from the Iwi and Māori collaborations category that has also been funded multi-year.*

*The reasons for the multi-year funding of initiatives are varied but the main reasons are around providing confidence to the Fund assessors about its effectiveness, distinctiveness and importance within their respective communities. External assessors consider each application with respect to the goals and objectives of the fund – to build resilience and increase capacity of Whānau Māori to prevent suicide. Initiatives that have received multi-year funding have demonstrated:*

- *A well designed, planned and implemented initiative*
- *Reach to targeted, at-risk communities and/or demographics*
- *Success with previous funded initiative(s)*

*Further analysis of final reporting from the 2021 initiatives is currently in progress however the table shows a brief cross-section of selected successes that have emerged from 2021 initiatives and show alignment with the objectives of the Fund”.*

*Table A: Cross-section of successes from the Māori Suicide Prevention Community Fund Initiatives - 2021*

<b><i>Goals and expectations</i></b>	<b><i>Successes</i></b>
<i>Enhancing mana focusing on activities that develop and are underpinned by whanaungatanga, kaitiakitanga, mātauranga, tikanga and manaakitanga.</i>	<ul style="list-style-type: none"> <li>• <i>Whanaungatanga and resilience developed</i></li> <li>• <i>Life lessons enhance mana and legacy</i></li> <li>• <i>Mastery of activities creates memories and strengthens identity.</i></li> </ul>

<p><i>Classes provided for community to create artworks</i></p>	<ul style="list-style-type: none"> <li>• <i>Increased knowledge of creative arts, whānau encouraged by completing works</i></li> <li>• <i>Creative expression and coping mechanisms explored</i></li> <li>• <i>Space to express themselves creatively</i></li> <li>• <i>Community whanaungatanga.</i></li> </ul>
<p><i>Providing opportunities for rangatahi to contribute back into the community through participation in a rongoa garden. Featuring basic lessons in rongoa and gardening, and intergenerational communication with koro, nana and tamariki. It also featured food hygiene, preparation, cooking, and serving kai.</i></p> <p><i>Rangatahi were also engaged in creating lyrics for songs about their stories then recording them.</i></p> <p><i>Connecting with rangatahi using an online interaction programme during COVID-19 lockdown to ensure ongoing contact, receive updates on life, write songs and make videos.</i></p>	<ul style="list-style-type: none"> <li>• <i>Sense of accomplishment, feeling proud and empowered by their efforts</i></li> <li>• <i>Supporting rangatahi to integrate confidently back into society and community</i></li> <li>• <i>Creating positive pathways for parents, caregivers and rangatahi through which to communicate</i></li> <li>• <i>Challenging governance and government processes to be more accountable and engaged with rangatahi and whānau during their journey.</i></li> </ul>
<p><i>Follow-up with whānau in Wellington, Ngawha and Rotorua to discuss whether the information and strategies about suicide and prevention discussed at the previous year's wānanga were useful or not and in what ways.</i></p>	<ul style="list-style-type: none"> <li>• <i>Whānau reported being in a much better position to know what to do and how to respond appropriately than the same time the previous year</i></li> <li>• <i>Many stories were shared, including about the stark reality of encountering a friend that had suicided, which prompted serious reflection about what could have been done by individuals to help prevent it from happening. It made what they had learned at the previous wānanga very real, relevant and applicable</i></li> <li>• <i>Further discussion about strategies for recognising risk factors and feelings of hopelessness and suicidal thoughts, and becoming more protective of whānau</i></li> </ul>

	<p><i>and being intentional in their support for whānau.</i></p>
<p><i>Bringing tangata, whānau, kaupapa-whānau, hapū, iwi, hāpori whanui and communities together to address the harm caused by Methamphetamine and suicidal ideations through education, awareness and to establish support groups throughout the community. The initiative set out to incorporate a dual approach to te ao Māori perspectives and approaches implemented by whānau lived experiences who understand addiction issues.</i></p>	<ul style="list-style-type: none"> <li>• <i>All mana manaaki facilitators have completed their level-5 Certificate in Suicide Prevention through Anamata to support the initiative as a collective to educate facilitators to help implement clinical and culturally safe messages about suicide prevention and suicide risk to whānau that attended the initiative</i></li> <li>• <i>The initiative is strongly aligned with organisations providing alcohol and other drug treatment service with the whānau that attended. It offers an opportunity for whānau and extended whānau to access AoD service support</i></li> <li>• <i>Empowered and upskilled the whole whānau to address methamphetamine addiction and education about suicide</i></li> <li>• <i>Emphasising that recovery does not happen in people; it happens between people, sharing the kōrero safety kanohi ki te kanohi</i></li> <li>• <i>Supporting whānau members with current addictions, but also creating an environment of prevention for future generations</i></li> <li>• <i>Supported rōpū groups to address mental health in the criminal justice system by implementing safety plans for whānau that were attending court hearings</i></li> <li>• <i>The Initiative used a te ao Māori approach to healing, understanding that mental health addiction and or suicide attempts cannot be separated.</i></li> </ul>
<p><i>Delivering Tuku atu, tuku mai workshop series that teaches about the symbolism in the local marae tukutuku patterns and showing whānau where they sat in all the imagery. While the tukutuku patterns derive</i></p>	<ul style="list-style-type: none"> <li>• <i>Whanaungatanga (connection)</i></li> <li>• <i>Manaakitanga (abundance)</i></li> <li>• <i>Kotahitanga (unity)</i></li> <li>• <i>Having whānau resonate with the kaupapa of the initiative to the point</i></li> </ul>



<p><i>from the taiao, they were also a way of recording and telling Māori stories. A combination of kaupapa Māori, marae based and mahi tūpuna makes for a comfortable environment for our people to reconnect, aspire and grow the awareness of the healing properties of toi Māori in all forms.</i></p>	<p><i>they opened up kōrero about suicide in their whānau.</i></p>
--	--

## **Postvention in Aotearoa New Zealand**

The Suicide Mortality Review Committee, identified the Fusion project as an exemplar of the benefits of working in and with the community for suicide prevention (in this case, postvention) (Suicide Mortality Review Committee, 2019). The project started in 2012 when deaths of 19 young people were recorded in Northland DHB. The Fusion process highlights the value of community involvement, close working relations with the polices and importance of timely updates on self-harm and suicide, that allow rapid follow-up with whānau and schools. People in the community who can provide an appropriate community response were identified. Fusion members assess risk of contagion, and map connections to identify possible risk and assess those who may be vulnerable based on their geographical and psychosocial proximity to the deceased, and the general population at risk. Fusion members individually look at the lives of both the deceased rangatahi and those who knew them; review connections with people, community, iwi and agencies; and share information about schooling, care, protection history and health history, and any other information accessible and considered relevant. This helps to determine vulnerability to self-harm and suicide, and the next actions. The community-centred process, embedded within the Māori cultural values and worldviews has been the cornerstone of success of this project.

The Ka Ao Ka Ao Postvention guideline for Māori provides specific cultural pathway of hope and healing for Māori bereaved by suicide. The recommended key elements include te reo Māori me ona tikanga, mātauranga Māori, knowledge in mental health, whakamōmori from Māori perspectives, with an understanding on the impact of these on the wairua of Māori and the ability to facilitate kōrero amongst Māori. Tangihanga and customary practices for Māori are important to the grieving process, and recovering from the losses of suicide (McClintock & Baker, 2019).

A recently published study by Amber McAllister (Te Arawa, Ngāti Whakaue), investigating the characteristics of whānau bereaved by suicide, included consideration of what allows some whānau to demonstrate resilience and wellbeing in the context of such a devastating loss. This well-written study has a number of important findings, but perhaps most relevant to this review the need for significant improvements in the ‘system’ response to a death by suicide and the recognition of whānau as resourceful (McAllister, 2021):

- *“The whānau structure and unit have many strengths, and therapists/services should be working with whānau to enhance their capabilities and capacities. Further, there are often whānau members that take the lead in how the whānau deals with the suicide loss. In supporting a whānau, identifying and supporting this person or persons may be effective, as well as being aware of the different needs of its members.*
- *Providing a safe forum for whānau hui and healing would be worthwhile, so members do not remain stuck, and the whānau remains connected despite the potential feelings of blame, guilt, and anger or behaviours of isolation. This would help develop the type of resilience identified that leads to growth and true healing rather than ‘soldiering on’. This would likely need to be facilitated by other people than psychologists such as Kaumātua or cultural advisors. It also needs to be led by Māori processes, with consideration of appropriate environment and allowance for time and space.*
- *The findings provide evidence that mātauranga Māori, tikanga Māori, and Te Ao Māori offer supports that may be more useful for Māori. The current formal supports are not working effectively, and those working with bereaved whānau need to understand the broader contexts in which whānau find themselves. This includes knowledge of intergenerational trauma, normalising elements of wairuatanga within the experience of suicide bereavement and as a contributing resilience and wellbeing factor. Wairuatanga and/or religion should be explored in whānau assessments as many Māori are spiritual, and some also have religious beliefs. Further, making sure the process and interventions are ones that whakamana the whānau”.*

## Conclusions and recommendations

Suicide is a complex phenomenon that occurs due to the convergence of genetic, psychological, social, cultural risk factors such as colonisation, loss of land, language and identity combined with experiences of trauma and loss. The World Health Organisation recommends comprehensive suicide prevention strategies including universal, selective, and indicated interventions (World Health Organization, 2014) based on evidence. The findings of this review form part of the evidence that the Suicide Prevention Office can utilise to underpin suicide prevention approaches in Aoteroa (Ministry of Health, 2019).

There have been some encouraging signs of a reduction in lives lost to suicide in the past three years (Pirkis et al., 2021), after a decade of relatively static rates (Ministry of Health, 2021b). The prevention of suicide deaths across all parts of our population suggests that the interventions were delivered at a population level. Suicide prevention activities need to build on this momentum, while also extending our understanding of how to reduce deaths among vulnerable groups such as children in care, prisoners, consumers of mental health services and members of the rainbow community (Suicide Mortality Review Committee, 2016; SUMRC et al., 2020).

Generating and synthesising evidence about what works in suicide prevention is complex (Hawton & Pirkis, 2017), every death by suicide is tragedy, but statistically suicide is a relatively rare event, making it challenging to demonstrate the impact of interventions on this outcome. Moreover, many interventions do not lend themselves to being tested using randomised controlled trials (RCTs), typically considered the gold-standard approach (Goldney, 2005). Therefore, assessing changes in other related outcomes such as self-harm and suicidal ideation is a commonly used approach. Several reviews have synthesised evidence regarding these proxy outcomes but are limited in several ways – such as only including RCTs (Calear et al., 2016b), focussed on specific intervention type (Hawton et al., 2016b), or a specific population group (Witt et al., 2021b), or in a particular setting (Xue et al., 2020) and thus do not cover the full spectrum of the challenge. Thus, there is need to provide a comprehensive overview of the effectiveness of the diverse range of interventions, implemented at different levels and for different population groups, especially in context of the unique opportunities and challenges that exist in Aotearoa.

A robust and elegant meta-analysis of 1,125 universal, selective and indicated intervention RCT's published over the past 50 highlights several important observations; despite the exponential increase in RCTs for suicidal behaviour, particularly since the 2000's, most studies continue to find small effect sizes, with most intervention approaches having similarly small effect sizes as each other at around 9% reduction in suicidal behaviours compared with control groups (Fox et al., 2020). Intervention efficacy has not significantly improved over time (Fox et al., 2020). Efficacy is similar across age groups, although slightly lower among adolescents. Most interventions have targeted mental illness, rather than suicidal thoughts or behaviours specifically and almost all interventions focus on individuals as the unit of intervention. A large number of trials in this area have quality issues, particularly the measurement of suicidal behaviour outcomes. On balance the evidence suggests that a person experiencing suicidal distress should be offered access to range of psychological interventions, so they can find one that best meets their needs. Given the evidence that cheaper, briefer, easy to deliver and scalable interventions are equally likely to be effective as technically complex, long term, hard to deliver and less scalable interventions (Fox et al., 2020) we should focus on offering a range of interventions, rather than creating the impression that only a single psychological interventions consistently demonstrates superiority for all people, in all contexts.

The search for reviews was conducted across databases producing a total of 30,375 articles. After duplicates were removed, 18,499 articles remained. After screening all titles and abstracts and subsequent full text reviews, 285 reviews were included in this report. The search for Indigenous and Pacific people intervention studies across scientific databases, theses depositories, organisations, professional networks, funding agencies, and key stakeholders produced 248 results. After screening the studies and reports, 22 are included in this report.

The following strategies are worth pursuing in Aotearoa New Zealand based on the evidence we have reviewed.

**Universal approaches** are important and to date have been relatively under-utilised in Aotearoa New Zealand. It seems likely that these approaches have the potential to prevent deaths among communities who are hard to reach using indicated approaches, particularly men, young people and Māori.

- In periods of recession increased expenditure as a proportion of GDP focusing on unemployment benefits, active support of return to labour market programmes and social welfare (Kim, 2018), active labour market policies and robust employment protection legislation, particularly for men (Shand et al., 2021). This approach is important in preventing male deaths by suicide
- Maximise the potential effectiveness of responsible media reporting guidelines by increasing adherence to safe reporting guidelines most likely by addressing the discrepant opinions between stakeholders on this matter in Aotearoa New Zealand. This approach is important in preventing young deaths by suicide
- Be cautious about mass media campaigns to enhance suicide prevention literacy and reduce stigma, given the mixed evidence of effectiveness that some campaigns have no or only very modest effects on literacy about suicide prevention, approximately one in three studies showing an effect on suicide attempts or deaths by suicide, and only half of the interventions targeting stigma were effective in reducing it. Such campaigns, if used, need to be part of a coherent multilevel intervention, have clear aims and be tailored to meet the needs of specific communities of interest
- Restrict access to locations associated with jumping. The installation of physical barriers, placing signage and telephones to support help-seeking, using blue lights (tested in rail stations), increasing the chances of intervention through use of surveillance and/or staff training, updated technology for faster stopping of trains, and guidelines for responsible reporting of locations associated with suicide are all important to consider in Aotearoa's suicide prevention plan. New constructions of railways, such as rail in Auckland, and roading networks especially should incorporate such strategies at the design stage to reduce suicides associated with the network. This approach is important in preventing deaths by suicide in urban areas.
- Continue to restrict access to other methods of suicide including guns (important to prevent deaths among older men and monitor the impact of recent legislative changes on these deaths), carbon monoxide gas, pesticides (important to prevent deaths in the Asian community)
- Pursue stronger restrictions in access to paracetamol (number of tablets in a pack, number of packs which can be purchased, pharmacy only sales), salicylates, dextropropoxyphene, barbiturates, and caffeine tablets, opioids with appropriate monitoring of the impact of such changes.

- Target acute alcohol intoxication and alcohol misuse by reducing access to alcohol, and increasing price (important to prevent deaths among men younger people and Māori)
- Ensure adherence to existing requirements in specific settings to reduce access to hanging as a method of suicide, including inpatient psychiatric settings, police stations and prisons (important to prevent deaths in Māori who are over-represented in these settings). This approach can be strengthened by using design for safety principles for emerging ligature points associated with hanging. There is an urgent need to ensure adherence to the basic approaches of adequate staffing and service user visibility in these settings which are strongly associated with risk of death and other adverse outcomes in these settings.
- Address the structural determinants associated with suicide including poverty, loss of land and language, discrimination and violence as outlined in *Te Mauri. The lifeforce. Rangatahi suicide report. Te pu-rongo mo-te mate whakamomori o te rangatahi. 2020.*

### **Selective interventions**

- There needs to a radical rethink about the expectations of suicide risk assessments in recognition of the fact that we have limited ability to predict who will engage in self-harm or die by suicide. The use of risk stratification, based on suicide risk assessment for deciding who can, or cannot access help services, is problematic and needs to be recognised as such. Assessments with those experiencing suicidal distress needs to focus on the factors contributing to that distress, that are amenable to intervention and resources directed towards providing effective solutions to those difficulties.
- There is a great deal of interest, and indeed clinical innovation, in the area of peer support and social support interventions. However, as yet there is little high-quality evidence evaluating these interventions in relation to suicidal behaviour outcomes. What is agreed, is that to operate effectively, peer support by those with lived experience of suicidal distress needs to be purposeful, well-planned, appropriately resourced and respect the expertise of peers with lived experience. Peer support is not the use of peers with lived experience as a free or low-cost workforce.
- There needs to be recognition that evidence for gatekeeper training is mixed; this approach may a valid method of improving the immediate knowledge, skills and self-efficacy of gatekeepers but this approach is unlikely to have a measurable impact on suicidal behaviour at a community level. It also needs to be recognised that positive training effects diminish over time, typically 4-6 months, so long-term and sustained

change is not achieved by current gatekeeper training interventions. Novel approaches to addressing these short-comings in gatekeeper training are being investigated locally. Consideration also needs to be given to the wellbeing and suicide outcomes for the gatekeepers themselves.

- Workplace interventions focusing on first responder (defined as military, police, firefighters and likely applies other first responders such as ambulance staff) suggests that multilevel interventions are associated with reduced suicide rates in these groups. Health and social care workers are a group experiencing significant pressures in the current context and require specific focussed interventions which focus on the organisational sources of their distress.
- There is a need for a greater focus on the prevention of all types of violence and particularly sexual violence as part of suicide prevention interventions. The experiences and needs of men who have been subject to sexual violence is particularly under-investigated.
- Although general practice presents an attractive location for suicide prevention initiatives, current evidence in this setting is limited. Possible benefits have been found for female patients, however initiatives also indicated harm when compared to control conditions. In Aotearoa New Zealand, the emergence of more psychological support in primary care settings through dedicated mental health and addiction support workers and integrated Health Improvement Practitioners (HIPs) may be offering benefit to suicide prevention however are yet to be evaluated and adherence with effective MDT integration between mental and physical healthcare clinicians is required.

### **Indicated interventions**

- Despite the exponential increase in RCTs for suicidal behaviour, most intervention approaches having similarly small effect sizes as each other at around 9% reduction in suicidal behaviours compared with control groups. Efficacy is similar across age groups, although slightly lower among adolescents
- People experiencing suicidal distress should be offered access to range of psychological interventions so they can find one that best meets their needs. The evidence presented in this review suggests that less costly, briefer, easy to deliver and scalable interventions are equally likely to be effective as technically complex, long term, hard to deliver and less scalable interventions (Fox et al., 2020). In particular, there is a mis-perception that DBT



(or DBT-A) is the only effective intervention for those engaging in self-harm. This perception may inadvertently deskill frontline workers who are not DBT trained, and reduce access to help.

- There are a range of psychological interventions being rolled out around the country. It is imperative that the safety and fidelity of these interventions are evaluated in the New Zealand context.
- Most psychological interventions focus on individuals as the unit of intervention, which is at odds with models of wellbeing such as Te Whare Tapa Wha and the emerging evidence of good practice from Pacifika and Māori suicide prevention efforts in Aotearoa New Zealand. The key unit of intervention is whānau.
- The digital delivery of interventions for suicidal ideation and self-harm may be a safe and acceptable option for those unwilling or unable to attend face-to-face delivery however, we need to understand more about the risk-benefit ratio of digital delivery. Effectiveness is increased if interventions are designed to specifically target suicide-related behaviours (e.g., suicidal thoughts) rather than associated difficulties such as depression. However, unique considerations are important when developing or purchasing these interventions such as rapidly increasing user expectations and high drop-out rates.
- Similar to other intervention approaches, evidence supporting the use of brief interventions, often in Emergency Department settings, is mixed with methodological limitations; this approach may work for some people, on some occasions and in any case compassionate, timely care is indicated for all those presenting for help with suicidal distress.
- There is a great deal of scope for enhanced adherence with best practice guidelines and a focus on compassionate care in Emergency Department settings.
- There is uncertain evidence regarding pharmacological interventions in adult patients who engage in self-harm, including non-suicidal self-injury (NSSI)
- Newer antidepressants may reduce depressive symptoms in a small and clinically unimportant way and may “at least slightly” increase the odds of suicide-related outcomes compared with placebo in children and adolescents. This creates a complex set of information for clinicians and whānau to navigate in creating a treatment plan for a young person and is not widely appreciated in the community
- Recent reviews suggest that ketamine, when used as an intervention for treatment resistance depression in adults, may have a positive short-term (72 hours) effect in

reducing suicidal ideation in populations with psychiatric disorder, however evidence was rated low to moderate and there is local experience of the significant challenges of offering ketamine clinics in public mental health settings.

- A number of organisations have over many years investigated systems of care to help reduce deaths by suicide among people in contact with mental health services. The findings of these reviews are fairly stable and tend to include recommendations such as removal of ligature points, management of absconding and improvements to assessment, which almost always stated in existing policies and procedures. We must now turn our attention to the implementation of recommendations, the leadership and organisational characteristics that foster meaningful change
- For young people the evidence is mixed for suicide prevention initiatives. Areas of promise include mental health awareness training, which appears to be effective and cost-effective amongst school students.
- Children in care have not received a great deal of focus, but are a group with multiple adversities; interventions aimed at improving foster care environments and relationships show promise
- While early findings for initiatives for rainbow youth are promising, evidence in this area has generally used feasibility and pilot study designs and sample sizes have been too small to demonstrate effectiveness. As a heterogeneous group, future work needs to differentiate between the needs of specific sexual and gender minorities. Attachment based family interventions show promise
- With an aging population in Aotearoa, more attention needs to be directed to the development and investigation of safe, culturally responsive, and effective initiatives for this population – the detection and treatment of depression appears protective for women, but not men (and there are some concerns about the use of medications for in this population). Interventions that target loneliness, address physical frailty, poverty and enhance social connection are promising (for women). Gate-keeper training for rest home staff may have some impact on the way suicidal residents are cared for but there is no evidence of effect on suicidal ideation or behaviours
- Overall, the strongest evidence base within in-patient settings supports the use of ward environment modifications, such as staff training, increasing staff to patient ratios, optimising patient visibility and conducting regular safety checks and monitoring both inside and outside of the wards. These design and staffing matters are currently important

in Aotearoa give the current Mental Health Infrastructure Programme (Ministry of Health, 2021a) to design and build a number of new inpatient psychiatric facilities around the country and have been noted both by suicide prevention researchers in New Zealand and the Ombudsman.

- Suicide prevention research amongst people diagnosed with physical health conditions is severely lacking.
- The evidence for effective postvention is beginning to emerge; recent investment in interventions for those bereaved by suicide in Aotearoa needs to be complemented with work to increase facilitation of culturally specific grieving practices without pathologising grief or representing it as a mental health crisis.
- Funding of bereavement support needs to recognise there is a great deal of heterogeneity in how whānau experience grief and increased focus on children (of all ages) who lose a parent or caregiver to suicide.

### **What we need to achieve greater gains in suicide prevention**

In order to achieve these changes in Aotearoa New Zealand, we need a clear commitment to a more nuanced and appropriately resourced national suicide prevention action plan.

We need an agreed and sustained outcomes framework to support greater clarity and communication about the purpose of any given intervention and the desired outcome. Te ao Māori is central to such a framework. Health economic evaluations need to be integrated to inform decisions about investment in a resource constrained environment. This outcomes framework needs to be publicly reported so the mahi can move forwards, rather than compromising the full impact resources by re-doing and re-learning work already done. As part of this approach there needs to be more clarity about the rationale connecting interventions for wellbeing and expectations for suicide prevention.

There is a great deal of expectation placed on a diverse range of professions in different parts of the workforce to make a contribution to suicide prevention. In order to achieve enhanced delivery of suicide prevention interventions, with fidelity and maximum likelihood of effectiveness we need a national workforce development plan with core competencies, minimum standards for curriculum development for undergraduate and post qualification training. This would support clear signaling about the nature and quality of training required

for different segments of the workforce and signally about suicide prevention training offerings and their suitability for contemporary Aotearoa New Zealand.

In order to support the delivery of high-quality interventions, we need a strategic research prioritization approach including a clear signal, perhaps using this evidence synthesis as starting point about the next big questions in prevention research in Aotearoa New Zealand are. We also need real time surveillance of both self-harm and suicide to support the evaluation of effectiveness of interventions.

Research funders need to focus on studies which integrate Te Ao Māori, are well designed trials using standardised measures of suicide outcomes, address the tendency to exclude participants due to elevated suicide risk, address intervention fidelity, and include cultural responsiveness as safe practice. Future studies should also evaluate drop-out rates and engagement to enable the identification of specific intervention components that maximise effectiveness for reducing suicidal outcomes.

## References

- Abarca, C., Gheza, C., Coda, C., & Elicer, B. (2018). Literature review to identify standardized scales for assessing adult suicide risk in the primary health care setting. *Medwave, 18*(5), e7246.
- Aggarwal, S., & Patton, G. (2018). Engaging families in the management of adolescent self-harm. *Evidence-based mental health, 21*(1), 16-22. doi:10.1136/eb-2017-102791
- Airey, N. D., & Iqbal, Z. (2020). Are Clinicians Confident in the Risk Assessment of Suicide?: A Systematic Literature Review. *Archives of suicide research : official journal of the International Academy for Suicide Research, 1*-13.
- Ali, B. (2019). *What works? Individuals' Experiences and Knowledge of Suicide Prevention Interventions in Aotearoa/New Zealand*. ResearchSpace@ Auckland. Retrieved from [https://www.researchgate.net/publication/356811767\\_What\\_works\\_Individuals'\\_Experiences\\_and\\_Knowledge\\_of\\_Suicide\\_Prevention\\_Interventions\\_in\\_AotearoaNew\\_Zealand](https://www.researchgate.net/publication/356811767_What_works_Individuals'_Experiences_and_Knowledge_of_Suicide_Prevention_Interventions_in_AotearoaNew_Zealand)
- Allen, J., Wexler, L., & Rasmus, S. (2021). Protective Factors as a Unifying Framework for Strength-Based Intervention and Culturally Responsive American Indian and Alaska Native Suicide Prevention. *Prevention science : the official journal of the Society for Prevention Research., 24*.
- Altavini, C. S., Ascutti, A. P. R., Solis, A. C. O., & Wang, Y. P. (2022). Revisiting evidence of primary prevention of suicide among adult populations: A systematic overview. *J Affect Disord, 297*, 641-656. doi:10.1016/j.jad.2021.10.076
- Andrews, C. A. (2015). *Kia Piki te Ora Suicide Prevention Programme Evaluation Final Report*. Retrieved from Wellington: <http://www.health.govt.nz/publication/kia-piki-te-ora-suicide-prevention-programme-evaluation-final-report>
- Andriessen, K., Krysinska, K., & Grad, O. T. (2017). *Postvention in action: The international handbook of suicide bereavement support*: Hogrefe Verlag.
- Andriessen, K., Krysinska, K., Hill, N. T. M., Reifels, L., Robinson, J., Reavley, N., & Pirkis, J. (2019a). Effectiveness of interventions for people bereaved through suicide: a systematic review of controlled studies of grief, psychosocial and suicide-related outcomes. *BMC Psychiatry, 19*(1), 49.
- Andriessen, K., Krysinska, K., Kolves, K., & Reavley, N. (2019b). Suicide postvention service models and guidelines 2014-2019: A systematic review. *Frontiers in Psychology Vol 10 2019, ArtID 2677, 10*.
- Andriessen, K., Krysinska, K., Kolves, K., & Reavley, N. (2019c). Suicide postvention service models and guidelines 2014-2019: A systematic review. *J Frontiers in psychology, 10*, 2677. doi:10.3389/fpsyg.2019.02677
- Ansari, B., Tote, K. M., Rosenberg, E. S., & Martin, E. G. (2020). A Rapid Review of the Impact of Systems-Level Policies and Interventions on Population-Level Outcomes Related to the Opioid Epidemic, United States and Canada, 2014-2018. *Public Health Reports, 135*(1), 100S-127S. doi:10.1177/0033354920922975
- Arshad, U., Farhat Ul, A., Gauntlett, J., Husain, N., Chaudhry, N., & Taylor, P. J. (2020). A Systematic Review of the Evidence Supporting Mobile- and Internet-Based Psychological Interventions For Self-Harm. *Suicide & Life-Threatening Behavior, 50*(1), 151-179. doi:10.1111/sltb.12583
- Audouard-Marzin, Y., Kopp-Bigault, C., Scouarnec, P., & Walter, M. (2019). General practitioners training about suicide prevention and risk: A systematic review of literature. *Presse Medicale, 48*(7-8 Pt 1), 767-779.
- Awan, S., Diwan, M. N., Aamir, A., Allahuddin, Z., Irfan, M., Carano, A., Vellante, F., Ventriglio, A., Fornaro, M., & Valchera, A. (2021). Suicide in healthcare workers: determinants, challenges, and the impact of COVID-19. *Frontiers in psychiatry, 12*. doi:10.3389/fpsyg.2021.792925

- Bahji, A., Pierce, M., Wong, J., Roberge, J. N., Ortega, I., & Patten, S. (2021a). Comparative efficacy and acceptability of psychotherapies for self-harm and suicidal behavior among children and adolescents: A systematic review and network meta-analysis. *JAMA network open*, 4(4), e216614-e216614.
- Bahji, A., Pierce, M., Wong, J., Roberge, J. N., Ortega, I., & Patten, S. (2021b). Comparative Efficacy and Acceptability of Psychotherapies for Self-harm and Suicidal Behavior Among Children and Adolescents: A Systematic Review and Network Meta-analysis. *JAMA Network Open*, 4(4), e216614.
- Baker, M., Sewell, T., Morris, T., McClintock, K., & Elkington, A. (2017). Waka Hourua, ko au, ko koe, ko tātou Māori suicide prevention community programme. *Journal of Indigenous Wellbeing*, 2(3), 32-40.
- Balaguru, V., Sharma, J., & Waheed, W. (2013). Understanding the effectiveness of school-based interventions to prevent suicide: A realist review. *Child and Adolescent Mental Health*, 18(3), 131-139.
- Barak, Y., Cheung, G., Fortune, S., & Glue, P. (2020). No country for older men: ageing male suicide in New Zealand. *Australasian Psychiatry: Publication of The Royal Australian and New Zealand College of Psychiatrists, Online first*.
- Barker, E., Kolves, K., & De Leo, D. (2014). Management of suicidal and self-harming behaviors in prisons: systematic literature review of evidence-based activities. *Archives of Suicide Research*, 18(3), 227-240.
- Barker, E., Kolves, K., & De Leo, D. (2017). Rail-suicide prevention: Systematic literature review of evidence-based activities. *Asia-Pacific Psychiatry*, 9(3), e12246. doi:10.1111/appy.12246
- Bartoli, F., Carra, G., Brambilla, G., Carretta, D., Crocamo, C., Neufeind, J., Baldacchino, A., Humphris, G., & Clerici, M. (2014). Association between depression and non-fatal overdoses among drug users: a systematic review and meta-analysis. *Drug & Alcohol Dependence*, 134, 12-21.
- Bartone, P. T., Bartone, J. V., Violanti, J. M., & Gileno, Z. M. (2019). Peer Support Services for Bereaved Survivors: A Systematic Review. *Omega - Journal of Death & Dying*, 80(1), 137-166.
- Beaudoin, F. L., Banerjee, G. N., & Mello, M. J. (2016). State-level and system-level opioid prescribing policies: The impact on provider practices and overdose deaths, a systematic review. *Journal of Opioid Management*, 12(2), 109-118.
- Beautrais, A. (2000). Risk factors for suicide and attempted suicide among young people. *Australia and New Zealand Journal of Psychiatry*, 34(3), 420 - 436. doi:10.1080/j.1440-1614.2000.00691.x
- Beautrais, A. (2005). National strategies for the reduction and prevention of suicide. *Crisis*, 26, 1 - 3. doi:10.1027/0227-5910.26.1.1
- Beautrais, A., Fergusson, D. M., & Horwood, L. J. (2006). Firearms legislation and reductions in firearm-related suicide deaths in New Zealand. *Aust N Z J Psychiatry*, 40(3), 253-259. doi:10.1080/j.1440-1614.2006.01782.x
- Beautrais, A. L., Gibb, S. J., Fergusson, D. M., Horwood, L. J., & Larkin, G. (2009). Removing Bridge Barriers Stimulates Suicides: An Unfortunate Natural Experiment. *Australian & New Zealand Journal of Psychiatry*, 43(6), 495-497. doi:10.1080/00048670902873714
- Bellairs-Walsh, I., Byrne, S. J., Bendall, S., Perry, Y., Kryszynska, K., Lin, A., Michail, M., Lamblin, M., Li, T. Y., & Hetrick, S. E. (2021). Working with young people at risk of suicidal behaviour and self-harm: A qualitative study of Australian general practitioners' perspectives. *International journal of environmental research and public health*, 18(24), 12926. doi:10.3390/ijerph182412926
- Belsher, B. E., Smolenski, D. J., Pruitt, L. D., Bush, N. E., Beech, E. H., Workman, D. E., Morgan, R. L., Evatt, D. P., Tucker, J., & Skopp, N. A. (2019). Prediction Models for Suicide Attempts and Deaths: A Systematic Review and Simulation. *JAMA Psychiatry*, 76(6), 642-651.
- Bennett, K., Rhodes, A. E., Duda, S., Cheung, A. H., Manassis, K., Links, P., Mushquash, C., Braunberger, P., Newton, A. S., Kutcher, S., Bridge, J. A., Santos, R. G., Manion, I. G., McLennan, J. D., Bagnell, A., Lipman, E., Rice, M., & Szatmari, P. (2015). A Youth Suicide Prevention Plan for Canada: A Systematic Review of Reviews. *Canadian Journal of Psychiatry - Revue Canadienne de Psychiatrie*, 60(6), 245-257.
- Benson, R., Rigby, J., Brunson, C., Corcoran, P., Dodd, P., Ryan, M., Cassidy, E., Colchester, D., Hawton, K., Lascelles, K., de Leo, D., Crompton, D., Kolves, K., Leske, S., Dwyer, J., Pirkis, J., Shave, R., Fortune,

- S., & Arensman, E. (2023). Real-Time Suicide Surveillance: Comparison of International Surveillance Systems and Recommended Best Practice. *Archives of Suicide Research*, 27(4), 1312-1338. doi:10.1080/13811118.2022.2131489
- Bergfeld, I. O., Mantione, M., Figuee, M., Schuurman, P., Lok, A., & Denys, D. (2018). Treatment-resistant depression and suicidality. *Journal of Affective Disorders*, 235, 362-367. doi:10.1016/j.jad.2018.04.016
- Berman, A. L., & Carter, G. (2020a). Technological Advances and the Future of Suicide Prevention: Ethical, Legal, and Empirical Challenges. *Suicide Life Threat Behav*, 50(3), 643-651. doi:10.1111/sltb.12610
- Berman, A. L., & Carter, G. (2020b). Technological advances and the future of suicide prevention: ethical, legal, and empirical challenges. *Suicide and Life-Threatening Behavior*, 50(3), 643-651. doi:10.1111/sltb.12610
- Bernert, R. A., Hilberg, A. M., Melia, R., Kim, J. P., Shah, N. H., & Abnoui, F. (2020). Artificial Intelligence and Suicide Prevention: A Systematic Review of Machine Learning Investigations. *International Journal of Environmental Research & Public Health*, 17(16), 15. doi:10.3390/ijerph17165929
- Bernert, R. A., Hom, M. A., & Roberts, L. W. (2014). A review of multidisciplinary clinical practice guidelines in suicide prevention: toward an emerging standard in suicide risk assessment and management, training and practice. *Academic Psychiatry*, 38(5), 585-592.
- Bertolote, J. M. (2004). Suicide prevention: at what level does it work? *World Psychiatry*, 3(3), 147-151.
- Black, M. H., Scott, M., Baker-Young, E., Thompson, C., McGarry, S., Hayden-Evans, M., Snyman, Z., Zimmermann, F., Kacic, V., & Falkmer, T. (2021). Preventing suicide in post-secondary students: a scoping review of suicide prevention programs. *J European child adolescent psychiatry*, 1-37. doi:0.1007/s00787-021-01858-8
- Blackett, J. (2014). *RE: SOLVE: An acceptability and feasibility study of problem solving therapy for young people at risk of self-harm*. ResearchSpace@ Auckland.
- Bohanna, I., & Wang, X. (2012). Media guidelines for the responsible reporting of suicide: a review of effectiveness. *Crisis: Journal of Crisis Intervention & Suicide*, 33(4), 190-198.
- Bolton, J. M., Gunnell, D., & Turecki, G. (2015). Suicide risk assessment and intervention in people with mental illness. *BMJ*, 351, h4978.
- Bonvoisin, T., Utyasheva, L., Knipe, D., Gunnell, D., & Eddleston, M. (2020). Suicide by pesticide poisoning in India: a review of pesticide regulations and their impact on suicide trends. *BMC Public Health*, 20(1), 251.
- Bornheimer, L. A., Zhang, A., Li, J., Hiller, M., & Tarrier, N. (2020). Effectiveness of Suicide-Focused Psychosocial Interventions in Psychosis: A Systematic Review and Meta-Analysis. *Psychiatric Services*, 71(8), 829-838.
- Bowden, M., McCoy, A., & Reavley, N. (2020). Suicidality and suicide prevention in culturally and linguistically diverse (CALD) communities: A systematic review. *International Journal of Mental Health*, 49(4), 293-320. doi:10.1080/00207411.2019.1694204
- Bowersox, N. W., Jagusch, J., Garlick, J., Chen, J. I., & Pfeiffer, P. N. (2021). Peer-based interventions targeting suicide prevention: A scoping review. *American Journal of Community Psychology*, 68(1-2), 232-248.
- Braun, C., Bschor, T., Franklin, J., & Baethge, C. (2016). Suicides and Suicide Attempts during Long-Term Treatment with Antidepressants: A Meta-Analysis of 29 Placebo-Controlled Studies Including 6,934 Patients with Major Depressive Disorder. *Psychotherapy & Psychosomatics*, 85(3), 171-179.
- Brausch, A. M., & Girresch, S. K. (2012). A review of empirical treatment studies for adolescents non suicidal self-injury. *Journal of Cognitive Psychotherapy*, 26(1), 3-18. doi:10.1891/0889-8391.26.1.3
- Briggs, S., Netuveli, G., Gould, N., Gkaravella, A., Gluckman, N. S., Kangogyere, P., Farr, R., Goldblatt, M. J., & Lindner, R. (2019). The effectiveness of psychoanalytic/psychodynamic psychotherapy for reducing suicide attempts and self-harm: systematic review and meta-analysis. *British Journal of Psychiatry*, 214(6), 320-328.

- Burke, T. A., Ammerman, B. A., & Jacobucci, R. (2019). The use of machine learning in the study of suicidal and non-suicidal self-injurious thoughts and behaviors: A systematic review. *Journal of Affective Disorders, 245*, 869-884.
- Busby, D. R., Hatkevich, C., McGuire, T. C., & King, C. A. (2020). Evidence-Based Interventions for Youth Suicide Risk. *Current Psychiatry Reports, 22*(2), 5.
- Buscher, R., Torok, M., Terhorst, Y., & Sander, L. (2020). Internet-Based Cognitive Behavioral Therapy to Reduce Suicidal Ideation: A Systematic Review and Meta-analysis. *JAMA Network Open, 3*(4), e203933.
- Cai, Z., Junus, A., Chang, Q., & Yip, P. S. F. (2022). The lethality of suicide methods: A systematic review and meta-analysis. *Journal of Affective Disorders, 300*, 121-129. doi:10.1016/j.jad.2021.12.054
- Calati, R., & Courtet, P. (2016). Is psychotherapy effective for reducing suicide attempt and non-suicidal self-injury rates? Meta-analysis and meta-regression of literature data. *Journal of Psychiatric Research, 79*, 8-20.
- Calear, A. L., Christensen, H., Freeman, A., Fenton, K., Busby Grant, J., Van Spijker, B., & Donker, T. (2016a). A systematic review of psychosocial suicide prevention interventions for youth. *J European child adolescent psychiatry, 25*(5), 467-482.
- Calear, A. L., Christensen, H., Freeman, A., Fenton, K., Grant, J. B., Van Spijker, B., & Donker, T. (2016b). A systematic review of psychosocial suicide prevention interventions for youth. *J European child adolescent psychiatry, 25*(5), 467-482. doi:10.1007/s00787-015-0783-4
- Carter, G., Milner, A., McGill, K., Pirkis, J., Kapur, N., & Spittal, M. J. (2017). Predicting suicidal behaviours using clinical instruments: systematic review and meta-analysis of positive predictive values for risk scales. *British Journal of Psychiatry, 210*(6), 387-395.
- Carter, G., Page, A., Large, M., Hetrick, S. E., Milner, A. J., Bendit, N., Walton, C., Draper, B., Hazell, P., Fortune, S., Burns, J., Patton, G., Lawrence, M., Dadd, L., Dudley, M., Robinson, J., & Christensen, H. (2016). Royal Australian and New Zealand College of Psychiatrists clinical practice guideline for the management of deliberate self-harm. *Australian & New Zealand Journal of Psychiatry, 50*(10), 939-1000. doi:10.1177/0004867416661039
- Carter, T., Walker, G. M., Aubeeluck, A., & Manning, J. C. (2019). Assessment tools of immediate risk of self-harm and suicide in children and young people: A scoping review. *Journal of Child Health Care, 23*(2), 178-199.
- Casey, D., Geulayov, G., Bale, E., Brand, F., Clements, C., Kapur, N., Ness, J., Patel, A., Waters, K., & Hawton, K. (2020). Paracetamol self-poisoning: Epidemiological study of trends and patient characteristics from the multicentre study of self-harm in England. *Journal of Affective Disorders, 276*, 699-706. doi:10.1016/j.jad.2020.07.091
- Castillo-Sanchez, G., Marques, G., Dorrnoro, E., Rivera-Romero, O., Franco-Martin, M., & De la Torre-Diez, I. (2020). Suicide Risk Assessment Using Machine Learning and Social Networks: a Scoping Review. *Journal of Medical Systems, 44*(12), 205.
- Cerel, J., Brown, M. M., Maple, M., Singleton, M., van de Venne, J., Moore, M., & Flaherty, C. (2019). How Many People Are Exposed to Suicide? Not Six. *Suicide Life Threat Behav, 49*(2), 529-534. doi:10.1111/sltb.12450
- Cervantes, P. E., Seag, D. E. M., Baroni, A., Gerson, R., Knapp, K., Tay, E. T., Wiener, E., & Horwitz, S. M. (2021). Universal Suicide Risk Screening for Youths in the Emergency Department: A Systematic Review. *Psychiatric services (Washington, D.C.)*, appips202000881.
- Chan, M. K., Bhatti, H., Meader, N., Stockton, S., Evans, J., O'Connor, R. C., Kapur, N., & Kendall, T. (2016). Predicting suicide following self-harm: Systematic review of risk factors and risk scales. *The British Journal of Psychiatry, 209*(4), 277-283. doi:10.1192/bjp.bp.115.170050
- Chaudhary, A. M. D., Memon, R. I., Dar, S. K., Bhullar, D. K., Dar, K. R., & Naveed, S. (2020). Suicide during Transition of Care: a Review of Targeted Interventions. *Psychiatric Quarterly, 91*(2), 417-450.



- Chauliac, N., Leane, E., Gardette, V., Poulet, E., & Duclos, A. (2020). Suicide Prevention Interventions for Older People in Nursing Homes and Long-Term Care Facilities: A Systematic Review. *Journal of Geriatric Psychiatry & Neurology*, 33(6), 307-315.
- Chavez-Flores, Y. V., Hidalgo-Rasmussen, C. A., & Yanez-Penunuri, L. Y. (2019). Assessment tools of non-suicidal self-injury in adolescents 1990-2016: a systematic review. *Ciencia & Saude Coletiva*, 24(8), 2871-2882.
- Chen, M., & Chan, K. L. (2020). Effectiveness of Digital Health Interventions on Unintentional Injury, Violence, and Suicide: Meta-Analysis. *Trauma, violence & abuse*, 23(2), 605-619. doi:10.1177/1524838020967346
- Chen, S., Cheng, Y., Zhao, W., & Zhang, Y. (2021a). Effects of dialectical behaviour therapy on reducing self-harming behaviours and negative emotions in patients with borderline personality disorder: A meta-analysis. *Journal of Psychiatric & Mental Health Nursing (John Wiley & Sons, Inc.)*, 28(6), 1128-1139. doi:10.1111/jpm.12797
- Chen, S. Y., Cheng, Y., Zhao, W. W., & Zhang, Y. H. (2021b). Effects of dialectical behaviour therapy on reducing self-harming behaviours and negative emotions in patients with borderline personality disorder: A meta-analysis. *Journal of Psychiatric & Mental Health Nursing (John Wiley & Sons, Inc.)*, 28(6), 1128-1139. doi:10.1111/jpm.12797
- Chen, Y., Magnin, C., Brunelin, J., Leane, E., Fang, Y., & Poulet, E. (2021c). Can seizure therapies and noninvasive brain stimulations prevent suicidality? A systematic review. *Brain and Behavior*, 11(5), e02144.
- Cheng, Q., Li, H., Silenzio, V., & Caine, E. D. (2014). Suicide contagion: a systematic review of definitions and research utility. *PLOS ONE*, 9(9), e108724. doi:10.1371/journal.pone.0108724
- Chesin, M., Interian, A., Kline, A., Benjamin-Phillips, C., Latorre, M., & Stanley, B. (2016). Reviewing Mindfulness-Based Interventions for Suicidal Behavior. *Archives of Suicide Research*, 20(4), 507-527.
- Chesin, M., & Stanley, B. (2013). Risk assessment and psychosocial interventions for suicidal patients. *Bipolar Disorders*, 15(5), 584-593.
- Christensen, H., Batterham, P. J., & O'Dea, B. (2014). E-health interventions for suicide prevention. *Int J Environ Res Public Health*, 11(8), 8193-8212. doi:10.3390/ijerph110808193
- Cipriani, A., Hawton, K., Stockton, S., & Geddes, J. R. (2013). Lithium in the prevention of suicide in mood disorders: updated systematic review and meta-analysis. *BMJ*, 346, f3646.
- Clifford, A. C., Doran, C. M., & Tsey, K. (2013). A systematic review of suicide prevention interventions targeting indigenous peoples in Australia, United States, Canada and New Zealand. *BMC Public Health*, 13, 463.
- Collings, S., Slim, B., Stanley, J., & Jenkin, G. (2018). Suicide reports in the news – impact of Chief Coroner's call to open up suicide reporting. *Kōtuitui: New Zealand Journal of Social Sciences Online*, 13(2), 285-292. doi:10.1080/1177083X.2018.1478862
- Corcoran, J., Dattalo, P., Crowley, M., Brown, E., & Grindle, L. (2011). A systematic review of psychosocial interventions for suicidal adolescents. *Children and Youth Services Review*, 33(11), 2112-2118.
- Corke, M., Mullin, K., Angel-Scott, H., Xia, S., & Large, M. (2020). Meta-analysis of the strength of exploratory suicide prediction models; from clinicians to computers. *BJPsych open*, 7(1). doi:10.1192/bjo.2020.162
- Cottrell, D. J., Wright-Hughes, A., Eisler, I., Fortune, S., Green, J., House, A. O., Kerfoot, M., Owens, D. W., Simic, M., McLellan, V., Tubeuf, S., & Farrin, A. J. (2020). Longer-term effectiveness of systemic family therapy compared with treatment as usual for young people after self-harm: An extended follow up of pragmatic randomised controlled trial. *EclinicalMedicine*, 18, 100246. doi:<https://doi.org/10.1016/j.eclinm.2019.100246>
- Cox, G. R., & Hetrick, S. E. (2017). Psychosocial interventions for self-harm, suicidal ideation and suicide attempt in children and young people: What? How? Who? and Where? *J Evidence-based mental health*, 20(2), 35-40. doi:10.1136/eb-2017-102667

- Cox, G. R., Owens, C., Robinson, J., Nicholas, A., Lockley, A., Williamson, M., Cheung, Y. T., & Pirkis, J. (2013). Interventions to reduce suicides at suicide hotspots: a systematic review. *BMC Public Health*, *13*, 214.
- Cox, G. R., Robinson, J., Williamson, M., Lockley, A., Cheung, Y. T. D., & Pirkis, J. (2012). Suicide clusters in young people: Evidence for the effectiveness of postvention strategies. *Crisis: The Journal of Crisis Intervention and Suicide Prevention*, *33*(4), 208-214. doi:10.1027/0227-5910/a000144
- Cuijpers, P., de Beurs, D. P., van Spijker, B. A., Berking, M., Andersson, G., & Kerkhof, A. J. (2013). The effects of psychotherapy for adult depression on suicidality and hopelessness: a systematic review and meta-analysis. *Journal of Affective Disorders*, *144*(3), 183-190.
- Cusimano, M. D., & Sameem, M. (2011). The effectiveness of middle and high school-based suicide prevention programmes for adolescents: a systematic review. *Injury Prevention*, *17*(1), 43-49.
- D'Anci, K. E., Uhl, S., Giradi, G., & Martin, C. (2019). Treatments for the Prevention and Management of Suicide: A Systematic Review. *Annals of Internal Medicine*, *171*(5), 334-342.
- D'Hotman, D., & Loh, E. (2020). AI enabled suicide prediction tools: a qualitative narrative review. *BMJ Health & Care Informatics*, *27*(3).
- Dabkowski, E., & Porter, J. E. (2021). An exploration into suicide prevention initiatives for mental health nurses: A systematic literature review. *International Journal of Mental Health Nursing*, *30*(3), 610-623.
- Daigle, M. S., Pouliot, L., Chagnon, F., Greenfield, B., & Mishara, B. (2011). Suicide attempts: prevention of repetition. *Canadian Journal of Psychiatry - Revue Canadienne de Psychiatrie*, *56*(10), 621-629.
- Daly, C., Griffin, E., McMahon, E., Corcoran, P., Webb, R. T., Ashcroft, D. M., & Arensman, E. (2021). Paracetamol-related intentional drug overdose among young people: a national registry study of characteristics, incidence and trends, 2007–2018. *Social Psychiatry and Psychiatric Epidemiology*, *56*(5), 773-781. doi:10.1007/s00127-020-01981-y
- Davidson, K. M., & Tran, C. F. (2014). Impact of treatment intensity on suicidal behavior and depression in borderline personality disorder: a critical review. *Journal of Personality Disorders*, *28*(2), 181-197.
- de Aguiar, K. R., Bilhalva, J. B., Cabelleira, M. D., Guimarães, G. O., Madureira, T., Agako, A., de Souza, M. S., & Souza, L. D. M. (2021). The impact of mindfulness on suicidal behavior: a systematic review. *Trends Psychiatry Psychother.* doi:10.47626/2237-6089-2021-0316
- de Groot, M., & Kollen, B. J. (2013). Course of bereavement over 8-10 years in first degree relatives and spouses of people who committed suicide: longitudinal community based cohort study. *J BMJ*, *347*. doi:10.1136/bmj.f5519
- De Leo, D., Svetcic, J., & Milner, A. (2011). Suicide in Indigenous people in Queensland, Australia: trends and methods, 1994–2007. *J Australian New Zealand Journal of Psychiatry*, *45*(7), 532-538. doi:10.3109/00048674.2011.570310
- DeCou, C. R., Comtois, K. A., & Landes, S. J. (2019). Dialectical Behavior Therapy Is Effective for the Treatment of Suicidal Behavior: A Meta-Analysis. *Behavior Therapy*, *50*(1), 60-72.
- Del Matto, L., Muscas, M., Murru, A., Verdolini, N., Anmella, G., Fico, G., Corponi, F., Carvalho, A., Samalin, L., Carpiello, B., Fagiolini, A., Vieta, E., & Pacchiarotti, I. (2020). Lithium and suicide prevention in mood disorders and in the general population: A systematic review. *Neuroscience and Biobehavioral Reviews*, *116*, 142-153.
- Denny, S., Howie, H., Grant, S., Galbreath, R., Utter, J., Fleming, T., & Clark, T. (2018). Characteristics of school-based health services associated with students' mental health. *J Health Serv Res Policy*, *23*(1), 7-14. doi:10.1177/1355819617716196
- Devenish, B., Berk, L., & Lewis, A. J. (2016). The treatment of suicidality in adolescents by psychosocial interventions for depression: A systematic literature review. *Australian & New Zealand Journal of Psychiatry*, *50*(8), 726-740.

- Dong, X. Q., Chang, E. S., Zeng, P., & Simon, M. A. (2015). Suicide in the global Chinese aging population: A review of risk and protective factors, consequences, and interventions. *Aging and Disease*, 6(2), 121-130. doi:10.14336/AD.2014.0223
- Donker, T., Calear, A. L., Busby, G. J., van Spijker, B., Fenton, K., Hehir, K. K., Cuijpers, P., & Christensen, H. (2013). Suicide prevention in schizophrenia spectrum disorders and psychosis: a systematic review. *BMC Psychol*, 1(1), 6. doi:10.1186/2050-7283-1-6
- Doupnik, S. K., Rudd, B., Schmutte, T., Worsley, D., Bowden, C. F., McCarthy, E., Eggan, E., Bridge, J. A., & Marcus, S. C. (2020). Association of Suicide Prevention Interventions With Subsequent Suicide Attempts, Linkage to Follow-up Care, and Depression Symptoms for Acute Care Settings: A Systematic Review and Meta-analysis. *JAMA Psychiatry*, 77(10), 1021-1030.
- Dueweke, A. R., & Bridges, A. J. (2018). Suicide interventions in primary care: A selective review of the evidence. *Families, Systems, & Health*, 36(3), 289-302.
- Durie, M. H., Lawson-Te Aho, K. R., & Naera, M. H. (2017). Tūramarama ki te Ora ('Bringing Light to the Dark'): National Māori Strategy for Addressing Suicide 2017- 2022. *Te Rūnanga o Ngāti Pikiao Trust*.
- Ekanem, O. J., & Woods, P. (2021). Effectiveness of Nonsuicidal Self-Injury Interventions among Incarcerated Women in Correctional Facilities and Secure Settings: An Integrative Review. *Issues in mental health nursing*, 1-19.
- Erford, B. T., Jackson, J., Bardhoshi, G., Duncan, K., & Atalay, Z. (2018). Selecting suicide ideation assessment instruments: A meta-analytic review. *Measurement and Evaluation in Counseling and Development*, 51(1), 42-59. doi:10.1080/07481756.2017.1358062
- Every-Palmer, S., Cunningham, R., Jenkins, M., & Bell, E. (2021). The Christchurch mosque shooting, the media, and subsequent gun control reform in New Zealand: a descriptive analysis. *Psychiatry, Psychology and Law*, 28(2), 274-285. doi:10.1080/13218719.2020.1770635
- Exner-Cortens, D., Baker, E., Gray, S., Fernandez Conde, C., Rivera, R. R., Van Bavel, M., Vezina, E., Ambrose, A., Pawluk, C., Schwartz, K. D., & Arnold, P. D. (2021). School-Based Suicide Risk Assessment Using eHealth for Youth: Systematic Scoping Review. *JMIR Ment Health*, 8(9), e29454. doi:10.2196/29454
- Farias, M., Maraldi, E., Wallenkampf, K. C., & Lucchetti, G. (2020). Adverse events in meditation practices and meditation-based therapies: a systematic review. *Acta Psychiatrica Scandinavica*, 142(5), 374-393. doi:<https://doi.org/10.1111/acps.13225>
- Feldman, I., Gebreslassie, M., Sampaio, F., Nystrand, C., & Ssegonja, R. (2021). Economic Evaluations of Public Health Interventions to Improve Mental Health and Prevent Suicidal Thoughts and Behaviours: A Systematic Literature Review. *Administration & Policy in Mental Health*, 48(2), 299-315.
- Ferguson, M. S., Reis, J., Rabbetts, L., McCracken, T., Loughhead, M., Rhodes, K., Wepa, D., & Procter, N. (2020). The impact of suicide prevention education programmes for nursing students: A systematic review. *International Journal of Mental Health Nursing*, 29(5), 756-771. doi:10.1111/inm.12753
- Ferguson, M. S., Reis, J. A., Rabbetts, L., Ashby, H. J., Bayes, M., McCracken, T., Ross, C., & Procter, N. G. (2018). The effectiveness of suicide prevention education programs for nurses: A systematic review. *Crisis: The Journal of Crisis Intervention and Suicide Prevention*, 39(2), 96-109. doi:10.1027/0227-5910/a000479
- Ferguson, M. S., Rhodes, K., Loughhead, M., McIntyre, H., & Procter, N. (2021). The Effectiveness of the Safety Planning Intervention for Adults Experiencing Suicide-Related Distress: A Systematic Review. *Archives of suicide research : official journal of the International Academy for Suicide Research*, 1-24. doi:10.1080/13811118.2021.1915217
- Finlayson-Short, L., Hetrick, S. E., Krysinska, K., Harris, M., Salom, C., Stefanac, N., Bailey, E., & Robinson, J. (2020). Community Based Support for People at Risk for Suicide and Those Who Care for them - Areas for Improvement. *Archives of Suicide Research*, 24(2), 125-157. doi:10.1080/13811118.2019.1619113
- Flaherty, H. B. (2018). Treating adolescent nonsuicidal self-injury: a review of psychosocial interventions to guide clinical practice. *J Child adolescent social work* 35(1), 85-95. doi:10.1007/s10560-017-0505-5

- Fonseka, T. M., Bhat, V., & Kennedy, S. H. (2019). The utility of artificial intelligence in suicide risk prediction and the management of suicidal behaviors. *Australian & New Zealand Journal of Psychiatry*, 53(10), 954-964.
- Forte, A., Sarli, G., Polidori, L., Lester, D., & Pompili, M. (2021). The Role of New Technologies to Prevent Suicide in Adolescence: A Systematic Review of the Literature. *Medicina*, 57(2), 26.
- Fortune, S., & Hetrick, S. (2022a). Suicide risk assessments: Why are we still relying on these a decade after the evidence showed they perform poorly? *Aust N Z J Psychiatry*, 48674221107316. doi:10.1177/00048674221107316
- Fortune, S., & Hetrick, S. E. (2022b). Suicide risk assessments: Why are we still relying on these a decade after the evidence showed they perform poorly? *Aust N Z J Psychiatry*, 48674221107316. doi:10.1177/00048674221107316
- Fortune, S., McDonald, G., Chafer, A., Lilley, R., & Mulder, R. (2022). *Coronial Findings as An Estimate of the True Rate of Suicide*. Retrieved from
- Fountoulakis, K. N., Gonda, X., & Rihmer, Z. (2011). Suicide prevention programs through community intervention. *Journal of Affective Disorders*, 130(1-2), 10-16.
- Fox, K. R., Huang, X., Guzman, E. M., Funsch, K. M., Cha, C. B., Ribeiro, J. D., & Franklin, J. C. (2020). Interventions for suicide and self-injury: A meta-analysis of randomized controlled trials across nearly 50 years of research. *Psychological Bulletin*, 146(12), 1117-1145.
- Franklin, J. C., Ribeiro, J. D., Fox, K. R., Bentley, K. H., Kleiman, E. M., Huang, X., Musacchio, K. M., Jaroszewski, A. C., Chang, B. P., & Nock, M. K. (2017). Risk factors for suicidal thoughts and behaviors: A meta-analysis of 50 years of research. *Psychological bulletin*, 143(2), 187-232. doi:10.1037/bul0000084
- Frey, L. M., & Hunt, Q. A. (2018). Treatment For Suicidal Thoughts and Behavior: A Review of Family-Based Interventions. *Journal of Marital & Family Therapy*, 44(1), 107-124.
- Frey, L. M., Hunt, Q. A., Russon, J. M., & Diamond, G. (2022). Review of family-based treatments from 2010 to 2019 for suicidal ideation and behavior. *Journal of marital family therapy*, 48(1), 154-177. doi:0.1111/jmft.12568
- Gemmel, J. (2020). *Kaupapa Māori practitioner's whakaaro (thoughts) of traditional practices (rongōā, rāranga, mirimiri and pūrākau) assisting rangatahi Māori (Māori youth) with suicidal behaviours* (Master's of Science in Psychology), Massey University, Wellington, New Zealand, Wellington.
- Gijzen, M. W. M., Rasing, S. P. A., Creemers, D. H. M., Engels, R., & Smit, F. (2022). Effectiveness of school-based preventive programs in suicidal thoughts and behaviors: A meta-analysis. *Journal of Affective Disorders*, 298(A), 408-420. doi:10.1016/j.jad.2021.10.062
- Glenn, C. R., Esposito, E. C., Porter, A. C., & Robinson, D. J. (2019). Evidence Base Update of Psychosocial Treatments for Self-Injurious Thoughts and Behaviors in Youth. *Journal of Clinical Child & Adolescent Psychology*, 48(3), 357-392.
- Goldney, R. D. (2005). Suicide prevention: a pragmatic review of recent studies. *Crisis*, 26(3), 128-140. doi:10.1027/0227-5910.26.3.128
- Gonzales, A. H., & Bergstrom, L. (2013). Adolescent non-suicidal self-injury (NSSI) interventions. *Journal of Child & Adolescent Psychiatric Nursing*, 26(2), 124-130. doi:10.1111/jcap.12035
- Gorman, D. R., Bain, M., Inglis, J. H. C., Murphy, D., & Bateman, D. N. (2007). How has legislation restricting paracetamol pack size affected patterns of deprivation related inequalities in self-harm in Scotland? *Public Health*, 121(1), 45-50. doi:<https://doi.org/10.1016/j.puhe.2006.08.014>
- Gotzsche, P. C., & Gotzsche, P. K. (2017). Cognitive behavioural therapy halves the risk of repeated suicide attempts: systematic review. *Journal of the Royal Society of Medicine*, 110(10), 404-410.
- Gould, C., McGeorge, T., & Slade, K. (2018). Suicide Screening Tools for use in Incarcerated Offenders: A Systematic Review. *Archives of Suicide Research*, 22(3), 345-364.

- Griffiths, R., Dawber, A., McDougall, T., Midgley, S., & Baker, J. (2021). Interventions to reduce self-harm amongst children in mental health inpatient settings: Systematic review and narrative synthesis. *International Journal of Mental Health Nursing*. doi:10.1111/inm.12940
- Griffiths, R., Dawber, A., McDougall, T., Midgley, S., & Baker, J. (2022). Non-restrictive interventions to reduce self-harm amongst children in mental health inpatient settings: Systematic review and narrative synthesis. *International Journal of Mental Health Nursing*, 31(1), 35-50. doi:10.1111/inm.12940
- Grigoroglou, C., van der Feltz-Cornelis, C. M., Hodkinson, A., Coventry, P. A., Zghebi, S. S., Kontopantelis, E., Bower, P., Lovell, K., Gilbody, S., Waheed, W., Dickens, C., Archer, J., Blakemore, A., Adler, D. A., Aragones, E., Bjorkelund, C., Bruce, M. L., Buszewicz, M., Carney, R. M., Cole, M. G., Davidson, K. W., Gensichen, J., Grote, N. K., Russo, J., Huijbregts, K., Huffman, J. C., Menchetti, M., Patel, V., Richards, D. A., Rollman, B., Smit, A., Zijlstra-Vlasveld, M. C., Wells, K. B., Zimmermann, T., Unutzer, J., & Panagioti, M. (2021). Effectiveness of collaborative care in reducing suicidal ideation: An individual participant data meta-analysis. *General Hospital Psychiatry*, 71, 27-35. doi:10.1016/j.genhosppsy.2021.04.004
- Guille, C., Zhao, Z., Krystal, J., Nichols, B., Brady, K., & Sen, S. (2015). Web-based cognitive behavioral therapy intervention for the prevention of suicidal ideation in medical interns: a randomized clinical trial. *JAMA Psychiatry*, 72(12), 1192-1198. doi:jamapsychiatry.2015.1880
- Gunnell, D., Appleby, L., Arensman, E., Hawton, K., John, A., Kapur, N., Khan, M., O'Connor, R. C., & Pirkis, J. (2020). Suicide risk and prevention during the COVID-19 pandemic. *Lancet Psychiatry*, 7(6), 468-471. doi:10.1016/s2215-0366(20)30171-1
- Gunnell, D., Knipe, D., Chang, S. S., Pearson, M., Konradsen, F., Lee, W. J., & Eddleston, M. (2017). Prevention of suicide with regulations aimed at restricting access to highly hazardous pesticides: a systematic review of the international evidence. *The Lancet Global Health*, 5(10), e1026-e1037.
- Haggerty, R. J., & Mrazek, P. J. (1994). *Reducing risks for mental disorders: Frontiers for preventive intervention research* (Committee on Prevention of Mental Disorders Ed.). Washington: National Academy Press.
- Hamilton, E., & Klimes-Dougan, B. (2015). Gender differences in suicide prevention responses: implications for adolescents based on an illustrative review of the literature. *International Journal of Environmental Research & Public Health*, 12(3), 2359-2372. doi:10.3390/ijerph120302359
- Hanratty, D., Kilicaslan, J., Wilding, H., & Castle, D. (2019). A systematic review of efficacy of Collaborative Assessment and Management of Suicidality (CAMS) in managing suicide risk and deliberate self-harm in adult populations. *Australasian Psychiatry*, 27(6), 559-564.
- Harlow, A. F., Bohanna, I., & Clough, A. (2014). A systematic review of evaluated suicide prevention programs targeting indigenous youth. *Crisis: Journal of Crisis Intervention & Suicide*, 35(5), 310-321. doi:10.1027/0227-5910/a000265
- Harmon, L. M., Cooper, R., Nugent, W. R., & Butcher, J. J. (2016). A review of the effectiveness of military suicide prevention programs in reducing rates of military suicides. *Journal of Human Behavior in the Social Environment*, 26(1), 15-24.
- Haroz, E. E., Decker, E., Lee, C., Bolton, P., Spiegel, P., & Ventevogel, P. (2020). Evidence for suicide prevention strategies with populations in displacement: a systematic review. *Intervention (Amstelveen)*, 18(1), 37-44.
- Harris, I. M., Beese, S., & Moore, D. (2019). Predicting future self-harm or suicide in adolescents: a systematic review of risk assessment scales/tools. *BMJ Open*, 9(9), e029311.
- Harrod, C. S., Goss, C. W., Stallones, L., & DiGuseppi, C. (2014). Interventions for primary prevention of suicide in university and other post-secondary educational settings. *Cochrane Database of Systematic Reviews*(10), CD009439.
- Hatcher, S., Crawford, A., & Coupe, N. (2017). Preventing suicide in indigenous communities. *Current Opinion in Psychiatry*, 30(1), 21-25.

- Havarneanu, G. M., Burkhardt, J.-M., & Paran, F. (2015). A systematic review of the literature on safety measures to prevent railway suicides and trespassing accidents. *Accident Analysis and Prevention, 81*, 30-50.
- Haw, C., Hawton, K., Gunnell, D., & Platt, S. (2015). Economic recession and suicidal behaviour: Possible mechanisms and ameliorating factors. *International Journal of Social Psychiatry, 61*(1), 73-81.
- Hawkins, E. M., Coryell, W., Leung, S., Parikh, S. V., Weston, C., Nestadt, P., Nurnberger, J. I., Jr., Kaplin, A., Kumar, A., Farooqui, A. A., El-Mallakh, R. S., & National Network of Depression Centers Suicide Prevention Task, G. (2021a). Effects of somatic treatments on suicidal ideation and completed suicides. *Brain and Behavior, 11*(11), e2381.
- Hawkins, E. M., Coryell, W., Leung, S., Parikh, S. V., Weston, C., Nestadt, P., Nurnberger, J. I., Kaplin, A., Kumar, A., Farooqui, A. A., & El-Mallakh, R. S. (2021b). Effects of somatic treatments on suicidal ideation and completed suicides. *Brain and Behavior, 11*(11). doi:10.1002/brb3.2381
- Hawton, K., Bergen, H., Cooper, J., Turnbull, P., Waters, K., Ness, J., & Kapur, N. (2015a). Suicide following self-harm: findings from the multicentre study of self-harm in England, 2000–2012. *Journal of Affective Disorders, 175*, 147-151. doi:10.1016/j.jad.2014.12.062
- Hawton, K., Bergen, H., Simkin, S., Dodd, S., Pocock, P., Bernal, W., Gunnell, D., & Kapur, N. (2013). Long term effect of reduced pack sizes of paracetamol on poisoning deaths and liver transplant activity in England and Wales: interrupted time series analyses. *BMJ : British Medical Journal, 346*. doi:10.1136/bmj.f403
- Hawton, K., Hill, N. T. M., Gould, M., John, A., Lascelles, K., & Robinson, J. (2020). Clustering of suicides in children and adolescents. *The Lancet Child & Adolescent Health, 4*(1), 58-67.
- Hawton, K., & Pirkis, J. (2017). Suicide is a complex problem that requires a range of prevention initiatives and methods of evaluation. *The British Journal of Psychiatry, 210*(6), 381-383. doi:10.1192/bjp.bp.116.197459
- Hawton, K., & Williams, K. (2002). Influences of the media on suicide. *British Medical Journal, 325*(7377), 1374 - 1375. doi:10.1136/bmj.325.7377.1374
- Hawton, K., Witt, K. G., Taylor Salisbury, L. T., Arensman, E., Gunnell, D., Hazell, P., Townsend, E., & van Heeringen, K. (2016a). Psychosocial interventions for self-harm in adults. *Cochrane Database of Systematic Reviews*(5). doi:10.1002/14651858.CD012189
- Hawton, K., Witt, K. G., Taylor Salisbury, L. T., Arensman, E., Gunnell, D., Townsend, E., van Heeringen, K., & Hazell, P. (2015b). Interventions for self-harm in children and adolescents. *Cochrane Database of Systematic Reviews*(12). doi:10.1002/14651858.CD012013
- Hawton, K., Witt, K. G., Taylor Salisbury, T. L., Arensman, E., Gunnell, D., Hazell, P., Townsend, E., & van Heeringen, K. (2016b). Psychosocial interventions following self-harm in adults: a systematic review and meta-analysis. *The Lancet Psychiatry, 3*(8), 740-750. doi:10.1016/S2215-0366(16)30070-0
- Herron, F. B., Patterson, D. A., Nugent, W. R., & Troyer, J. M. (2016). Evidence-based gatekeeper suicide prevention in a small community context. *Journal of Human Behavior in the Social Environment, 26*(1), 25-36.
- Hetrick, S. E., McKenzie, J. E., Bailey, A. P., Sharma, V., Moller, C. I., Badcock, P. B., Cox, G. R., Merry, S. N., & Meader, N. (2021). New generation antidepressants for depression in children and adolescents: a network meta-analysis. *Cochrane Database of Systematic Reviews, 5*, CD013674.
- Hetrick, S. E., McKenzie, J. E., Cox, G. R., Simmons, M. B., & Merry, S. N. (2012). Newer generation antidepressants for depressive disorders in children and adolescents. *Cochrane Database of Systematic Reviews, 11*, CD004851.
- Hetrick, S. E., Robinson, J., Spittal, M. J., & Carter, G. (2016). Effective psychological and psychosocial approaches to reduce repetition of self-harm: a systematic review, meta-analysis and meta-regression. *BMJ Open, 6*(9), e011024. doi:10.1136/bmjopen-2016-011024
- Hill, K., Somerset, S., Armstrong, D., Schwarzer, R., & Chan, C. (2021). Saving Lives: A Systematic Review on the Efficacy of Theory-Informed Suicide Prevention Programs. *Community mental health journal, 58*, 454-473. doi:10.1007/s10597-021-00841-6

- Hobson, G. R., Caffery, L. J., Neuhaus, M., & Langbecker, D. H. (2019). Mobile Health for First Nations Populations: Systematic Review. *JMIR MHealth and UHealth*, 7(10), e14877.
- Hochschild, A., Grunebaum, M. F., & Mann, J. J. (2021). The rapid anti-suicidal ideation effect of ketamine: A systematic review. *Preventive Medicine*, 152(1), 106524. doi:10.1016/j.ypmed.2021.106524
- Hofstra, E., Van Nieuwenhuizen, C., Bakker, M., Özgül, D., Elfeddali, I., de Jong, S. J., & van der Feltz-Cornelis, C. M. (2020). Effectiveness of suicide prevention interventions: a systematic review and meta-analysis. *J General hospital psychiatry*, 63, 127-140. doi:10.1016/j.genhosppsy.2019.04.011
- Holm, A. L., Salemonsén, E., & Severinsson, E. (2021). Suicide prevention strategies for older persons-An integrative review of empirical and theoretical papers. *Nursing Open*, 8(5), 2175-2193.
- Holmes, G., Clacy, A., Hermens, D. F., & Lagopoulos, J. (2021). The Long-Term Efficacy of Suicide Prevention Gatekeeper Training: A Systematic Review. *Archives of Suicide Research*, 25(2), 177-207.
- Hou, X., Wang, J., Guo, J., Zhang, X., Liu, J., Qi, L., & Zhou, L. (2021). Methods and efficacy of social support interventions in preventing suicide: a systematic review and meta-analysis. *Evid Based Ment Health*. doi:10.1136/ebmental-2021-300318
- Howe, S. J., Hewitt, K., Baraskewich, J., Cassidy, S., & McMorris, C. A. (2020). Suicidality Among Children and Youth With and Without Autism Spectrum Disorder: A Systematic Review of Existing Risk Assessment Tools. *Journal of Autism & Developmental Disorders*, 50(10), 3462-3476.
- Hunter, A. A., DiVietro, S., Boyer, M., Burnham, K., Chenard, D., & Rogers, S. C. (2021). The practice of lethal means restriction counseling in US emergency departments to reduce suicide risk: a systematic review of the literature. *Injury Epidemiology*, 8(54). doi:10.1186/s40621-021-00347-5
- Hurzeler, T., Giannopoulos, V., Uribe, G., Louie, E., Haber, P., & Morley, K. C. (2021). Psychosocial Interventions for Reducing Suicidal Behaviour and Alcohol Consumption in Patients With Alcohol Problems: A Systematic Review of Randomized Controlled Trials. *Alcohol & Alcoholism*, 56(1), 17-27.
- Hvidt, E. A., Ploug, T., & Holm, S. (2016). The impact of telephone crisis services on suicidal users: A systematic review of the past 45 years. *Mental Health Review Journal*, 21(2), 141-160.
- Inagaki, M., Kawashima, Y., Kawanishi, C., Yonemoto, N., Sugimoto, T., Furuno, T., Ikeshita, K., Eto, N., Tachikawa, H., Shiraishi, Y., & Yamada, M. (2015). Interventions to prevent repeat suicidal behavior in patients admitted to an emergency department for a suicide attempt: a meta-analysis. *Journal of Affective Disorders*, 175, 66-78.
- Inagaki, M., Kawashima, Y., Yonemoto, N., & Yamada, M. (2019). Active contact and follow-up interventions to prevent repeat suicide attempts during high-risk periods among patients admitted to emergency departments for suicidal behavior: a systematic review and meta-analysis. *BMC Psychiatry*, 19(1), 44.
- Ishimo, M. C., Sampasa-Kanyinga, H., Olibris, B., Chawla, M., Berfeld, N., Prince, S. A., Kaplan, M. S., Orpana, H., & Lang, J. J. (2021). Universal interventions for suicide prevention in high-income Organisation for Economic Co-operation and Development (OECD) member countries: a systematic review. *Injury Prevention*, 27(2), 184-193.
- Itzhaky, L., Davaasambu, S., Ellis, S. P., Cisneros-Trujillo, S., Hannett, K., Scolaro, K., Stanley, B. H., Mann, J. J., Wainberg, M. L., Oquendo, M. A., & Sublette, M. E. (2021). Twenty-six years of psychosocial interventions to reduce suicide risk in adolescents: Systematic review and meta-analysis. *J Affect Disord*, 300, 511-531. doi:10.1016/j.jad.2021.12.094
- Ivbijaro, G., Kolkiewicz, L., Goldberg, D., N'Jie I, N. S., Edwards, T., Riba, M. B., Svab, I., Geller, J., & Enum, Y. (2021). Suicide prevention and COVID-19. *Asia-Pacific psychiatry : Official Journal of the Pacific Rim College of Psychiatrists*, 13(3), e12482.
- Ivbijaro, G., Kolkiewicz, L., Goldberg, D., Riba, M. B., N'Jie I, N. S., Geller, J., Kallivayalil, R., Javed, A., Svab, I., Summergrad, P., Laher, S., & Enum, Y. (2019). Preventing suicide, promoting resilience: Is this achievable from a global perspective? *Asia-Pacific psychiatry : Official Journal of the Pacific Rim College of Psychiatrists*, 11(4), e12371.

- Iyengar, U., Snowden, N., Asarnow, J. R., Moran, P., Tranah, T., & Ougrin, D. (2018). A further look at therapeutic interventions for suicide attempts and self-harm in adolescents: an updated systematic review of randomized controlled trials. *Frontiers in psychiatry*, *9*, 583. doi:10.3389/fpsy.2018.00583
- Jenkin, G., Quigg, S., Paap, H., Cooney, E., Peterson, D., & Every-Palmer, S. (2022). Places of safety? Fear and violence in acute mental health facilities: A large qualitative study of staff and service user perspectives. *PLoS One*, *17*(5), e0266935. doi:10.1371/journal.pone.0266935
- Jenkin, G., Slim, B. E., & Collings, S. (2020). News Media Coverage of Stakeholder Views on Suicide and Its Reporting in New Zealand. *Crisis*, *41*(4), 248-254. doi:10.1027/0227-5910/a000629
- Jin, H. M., Khazem, L. R., & Anestis, M. D. (2016). Recent Advances in Means Safety as a Suicide Prevention Strategy. *Current Psychiatry Reports*, *18*(10), 96.
- Joe, S., Scott, M. L., & Banks, A. (2018). What works for adolescent Black males at risk of suicide: A review. *Research on Social Work Practice*, *28*(3), 340-345.
- Jones, W. G. (2017). *Ārai Whakamōmori: An Exploration of Te Whakaruruhau's Suicide Prevention Strategy*. (Master of Social Sciences), The University of Waikato. Retrieved from <https://researchcommons.waikato.ac.nz/bitstream/handle/10289/11700/thesis.pdf?sequence=4&isAllowed=y>
- Jordan, J. R., & McIntosh, J. L. (2011). Is suicide bereavement different? A framework for rethinking the question *Grief after suicide* (pp. 49-72): Routledge.
- Journot-Reverbel, K., Raynaud, J., Bui, E., & Revet, A. (2017). Support groups for children and adolescents bereaved by suicide: Lots of interventions, little evidence. *Psychiatry Research*, *250*, 253-255. doi:10.1016/j.psychres.2017.01.077
- Katsivarda, C., Assimakopoulos, K., & Jelastopulu, E. (2021). Communication-based suicide prevention after the first attempt. A systematic review. *Psychiatriki*, *32*(1), 51-58.
- Katz, C., Bolton, S.-L., Katz, L. Y., Isaak, C., Tilston-Jones, T., & Sareen, J. (2013). A systematic review of school-based suicide prevention programs. *Depression and Anxiety*, *30*(10), 1030-1045.
- Kawashima, Y., Yonemoto, N., Inagaki, M., Inoue, K., Kawanishi, C., & Yamada, M. (2019). Interventions to prevent suicidal behavior and ideation for patients with cancer: A systematic review. *General Hospital Psychiatry*, *60*, 98-110.
- Kessler, R. C., Bossarte, R. M., Luedtke, A., Zaslavsky, A. M., & Zubizarreta, J. R. (2020). Suicide prediction models: a critical review of recent research with recommendations for the way forward. *Molecular Psychiatry*, *25*(1), 168-179.
- Kia, H., MacKinnon, K. R., Abramovich, A., & Bonato, S. (2021). Peer support as a protective factor against suicide in trans populations: A scoping review. *Social Science & Medicine*, *279*. doi:10.1016/j.socscimed.2021.114026
- Kiley, K., Volpe, D., Schenkel, S. R., & DeGrazia, M. (2020). Constant observation of pediatric patients at risk for self-harm and suicide: An evidence-based practice inquiry. *Applied Nursing Research*, *55*, N.PAG-N.PAG. doi:10.1016/j.apnr.2020.151294
- Kim, C. (2018). The Impacts of Social Protection Policies and Programs on Suicide: A Literature Review. *International Journal of Health Services*, *48*(3), 512-534.
- Klimes-Dougan, B., Klingbeil, D. A., & Meller, S. J. (2013). The impact of universal suicide-prevention programs on the help-seeking attitudes and behaviors of youths. *Crisis: Journal of Crisis Intervention & Suicide*, *34*(2), 82-97.
- KoKoAung, E., & Aromataris, E. (2012). The association between suicidality and treatment with selective serotonin reuptake inhibitors in older people with major depression: A systematic review. *JBIC Database of Systematic Reviews and Implementation Reports*, *13*(3), 174-205. doi:10.11124/jbisrir-2015-2272



- Kolves, K., Chitty, K. M., Wardhani, R., Varnik, A., de Leo, D., & Witt, K. G. (2020). Impact of Alcohol Policies on Suicidal Behavior: A Systematic Literature Review. *International Journal of Environmental Research & Public Health*, 17(19), 25. doi:10.3390/ijerph17197030
- Kothgassner, O. D., Goreis, A., Robinson, K., Huscsava, M. M., Schmahl, C., & Plener, P. L. (2021). Efficacy of dialectical behavior therapy for adolescent self-harm and suicidal ideation: a systematic review and meta-analysis. *Psychological Medicine*, 51(7), 1057-1067.
- Kothgassner, O. D., Robinson, K., Goreis, A., Ougrin, D., & Plener, P. L. (2020). Does treatment method matter? A meta-analysis of the past 20 years of research on therapeutic interventions for self-harm and suicidal ideation in adolescents. *Borderline Personal Disord Emot Dysregul*, 7, 9. doi:10.1186/s40479-020-00123-9
- Kral, M. J. (2016). Suicide and Suicide Prevention among Inuit in Canada. *Can J Psychiatry*, 61(11), 688-695. doi:10.1177/0706743716661329
- Kreuze, E., Jenkins, C., Gregoski, M., York, J., Mueller, M., Lamis, D. A., & Ruggiero, K. J. (2017). Technology-enhanced suicide prevention interventions: A systematic review. *Journal of Telemedicine & Telecare*, 23(6), 605-617.
- Kreuze, E., & Lamis, D. A. (2018). A Review of Psychometrically Tested Instruments Assessing Suicide Risk in Adults. *Omega - Journal of Death & Dying*, 77(1), 36-90.
- Kritzer, M. D., Mischel, N. A., Young, J. R., Lai, C. S., Masand, P. S., Szabo, S. T., & Mathew, S. J. (2021). Ketamine for treatment of mood disorders and suicidality: A narrative review of recent progress. *Annals of clinical psychiatry : official journal of the American Academy of Clinical Psychiatrists*, 33(4), e10-e20. doi:10.12788/acp.0048
- Krysinska, K., Andriessen, K., Ozols, I., Reifels, L., Robinson, J., & Pirkis, J. (2021). Effectiveness of psychosocial interventions for family members and other informal support persons of individuals who have made a suicide attempt: A systematic review. *Crisis: The Journal of Crisis Intervention and Suicide Prevention*, 43(3), 245-260. doi:10.1027/0227-5910/a000776
- Krysinska, K., Batterham, P. J., & Christensen, H. (2017). Differences in the Effectiveness of Psychosocial Interventions for Suicidal Ideation and Behaviour in Women and Men: A Systematic Review of Randomised Controlled Trials. *Archives of Suicide Research*, 21(1), 12-32.
- Krysinska, K., Batterham, P. J., Tye, M., Shand, F., Calear, A. L., Cockayne, N., & Christensen, H. (2016). Best strategies for reducing the suicide rate in Australia. *Australian & New Zealand Journal of Psychiatry*, 50(2), 115-118. doi:10.1177/0004867415620024
- Kucuker, M. U., Almorsy, A. G., Sonmez, A. I., Ligezka, A. N., Doruk Camsari, D., Lewis, C. P., & Croarkin, P. E. (2021). A Systematic Review of Neuromodulation Treatment Effects on Suicidality. *Frontiers in Human Neuroscience*, 15 doi:10.3389/fnhum.2021.660926
- Kukutai, T., & Cormack, D. (2019). Mana motuhake ā-raraunga: datafication and social science research in Aotearoa. *14(2)*, 201-208.
- Kutcher, S., Wei, Y., & Behzadi, P. (2017). School- and Community-Based Youth Suicide Prevention Interventions: Hot Idea, Hot Air, or Sham? *Canadian Journal of Psychiatry*, 62(6), 381-387. doi:10.1177/0706743716659245
- Labelle, R., Pouliot, L., & Janelle, A. (2015). A systematic review and meta-analysis of cognitive behavioural treatments for suicidal and self-harm behaviours in adolescents. *J Canadian Psychology*, 56(4), 368-378. doi:10.1037/a0039159
- Lai, M. H., Maniam, T., Chan, L. F., & Ravindran, A. V. (2014). Caught in a Web: A review of Web-based suicide prevention. *Journal of Medical Internet Research*, 16(1), 170-177. doi:10.2196/jmir.2973
- Lapierre, S., Erlangsen, A., Waern, M., de Leo, D., Oyama, H., Scocco, P., Gallo, J., Szanto, K., Conwell, Y., Draper, B., & Quinnett, P. (2011). A systematic review of elderly suicide prevention programs. *Crisis*, 32(2), 88-98. doi:10.1027/0227-5910/a000076
- Large, M., Myles, N., Myles, H., Corderoy, A., Weiser, M., Davidson, M., & Ryan, C. (2018). Suicide risk assessment among psychiatric inpatients: A systematic review and meta-analysis of high-risk categories. *Psychological Medicine*, 48(7), 1119-1127.

- Lawson-Te Aho, K., & McClintock, K. (2020). *Māori Suicide Prevention Research, Policy, & Practice: Summer School Symposium Report and Recommendations: Te Rau Matatini*.
- Leavey, K., & Hawkins, R. (2017). Is cognitive behavioural therapy effective in reducing suicidal ideation and behaviour when delivered face-to-face or via e-health? A systematic review and meta-analysis. *Cognitive Behaviour Therapy*, 46(5), 353-374.
- Lengvenyte, A., Olie, E., Strumila, R., Navickas, A., Gonzalez Pinto, A., & Courtet, P. (2021). Immediate and short-term efficacy of suicide-targeted interventions in suicidal individuals: A systematic review. *World Journal of Biological Psychiatry*, 22(9), 670-685.
- Leske, S., Paul, E., Gibson, M., Little, B., Wenitong, M., & Kolves, K. (2020). Global systematic review of the effects of suicide prevention interventions in Indigenous peoples. *Journal of Epidemiology & Community Health*, 74(12), 1050-1055.
- Lestienne, L., Leane, E., Haesebaert, J., Poulet, E., & Andriessen, K. (2021). An integrative systematic review of online resources and interventions for people bereaved by suicide. *Preventive Medicine*, 152(1), 106583. doi:10.1016/j.yjmed.2021.106583
- Lewitzka, U., Severus, E., Bauer, R., Ritter, P., Muller-Oerlinghausen, B., & Bauer, M. (2015). The suicide prevention effect of lithium: More than 20 years of evidence—a narrative review. *International Journal of Bipolar Disorders*, 3(1). doi:10.1186/s40345-015-0032-2
- Lim, J. S., Buckley, N. A., Chitty, K. M., Moles, R. J., & Cairns, R. (2021). Association Between Means Restriction of Poison and Method-Specific Suicide Rates: A Systematic Review. *JAMA Health Forum*, 2(10), e213042-e213042. doi:10.1001/jamahealthforum.2021.3042
- Linde, K., Treml, J., Steinig, J., Nagl, M., & Kersting, A. (2017). Grief interventions for people bereaved by suicide: A systematic review. *PLoS One*, 12(6), e0179496. doi:10.1371/journal.pone.0179496
- Long, J., Sun, Y., Zhao, J., Liu, J., & Peng, X. (2021). Temporal trends of carbon monoxide poisoning mortality at the global, regional and national levels: a cross-sectional study from the Global Burden of Disease study, 1990 and 2017. *BMJ Open*, 11(11), e053240. doi:10.1136/bmjopen-2021-053240
- Lopez-Castroman, J., Moulahi, B., Aze, J., Bringay, S., Deninotti, J., Guillaume, S., & Baca-Garcia, E. (2020). Mining social networks to improve suicide prevention: A scoping review. *Journal of Neuroscience Research*, 98(4), 616-625.
- Love, C., Lawson-Te Aho, K., Love, N., & Shariff, S. (2016). *Te Rā o Te Waka Hourua Research Project: 'Towards Mauri Ora': Entrepreneurship Education and Community Development for 'hard to reach' Rangatahi and their Whānau – Pathways and Models for Sustainable Development*. Retrieved from
- Luxton, D. D., June, J. D., & Comtois, K. A. (2013). Can postdischarge follow-up contacts prevent suicide and suicidal behavior? A review of the evidence. *Crisis: Journal of Crisis Intervention & Suicide*, 34(1), 32-41.
- Maguire, L., Bullard, T., & Papa, L. (2021). Ketamine for acute suicidality in the emergency department: A systematic review. *American Journal of Emergency Medicine*, 43, 54-58.
- Malakouti, S. K., Rasouli, N., Rezaeian, M., Nojomi, M., Ghanbari, B., & Shahraki Mohammadi, A. (2020). Effectiveness of self-help mobile telephone applications (apps) for suicide prevention: A systematic review. *Med J Islam Repub Iran*, 34, 85. doi:10.34171/mjiri.34.85
- Mann, J. J., & Michel, C. A. (2016). Prevention of Firearm Suicide in the United States: What Works and What Is Possible. *Am J Psychiatry*, 173(10), 969-979. doi:10.1176/appi.ajp.2016.16010069
- Mann, J. J., Michel, C. A., & Auerbach, R. P. (2021). Improving suicide prevention through evidence-based strategies: a systematic review. *American journal of psychiatry*. doi:10.1176/appi.ajp.2020.20060864
- Martinez-Miranda, J. (2017). Embodied Conversational Agents for the Detection and Prevention of Suicidal Behaviour: Current Applications and Open Challenges. *Journal of Medical Systems*, 41(135). doi:10.1007/s10916-017-0784-6
- Marzano, L., Hawton, K., Rivlin, A., Smith, E., Piper, M., & Fazel, S. (2016). Prevention of suicidal behavior in prisons: An overview of initiatives based on a systematic review of research on near-lethal suicide

- attempts. *Crisis: The Journal of Crisis Intervention and Suicide Prevention*, 37(5), 323-334. doi:10.1027/0227-5910/a000394
- Mathieu, S., de Leo, D., Koo, Y. W., Leske, S., Goodfellow, B., & Kölves, K. (2021). Suicide and suicide attempts in the Pacific Islands: A Systematic Literature Review. *Lancet Reg Health West Pac*, 17, 100283. doi:10.1016/j.lanwpc.2021.100283
- McAllister, A. (2021). *The Whānau Experience of Suicide Loss: What Contributes to Resilience and Wellbeing?* (Doctor of Clinical Psychology, ), Massey University, Te Kunenga ki Pūrehuroa, Auckland.
- McCabe, R., Garside, R., Backhouse, A., & Xanthopoulou, P. (2018). Effectiveness of brief psychological interventions for suicidal presentations: a systematic review. *BMC Psychiatry*, 18(1), 120.
- McClintock, K. (2019). *Waka Hourua Māori Suicide Research Symposium 2019*. Wellington: Te Rau Ora.
- McClintock, K., & Baker, M. (2019). *Ka Ao, Ka Ao Postvention for Māori*: Te Rau Matatini.
- McClintock, K., & McClintock, R. (2017). Hōea te waka: Indigenous suicide prevention outcomes framework and evaluation processes - Part 1. *Journal of Indigenous Wellbeing*, 2(2).
- McHugh, C. M., Corderoy, A., Ryan, C. J., Hickie, I. B., & Large, M. M. (2019). Association between suicidal ideation and suicide: meta-analyses of odds ratios, sensitivity, specificity and positive predictive value. *BJPsych open*, 5(2). doi:10.1192/bjo.2018.88
- McHugh, C. M., & Large, M. M. (2020). Can machine-learning methods really help predict suicide? *Current opinion in psychiatry*, 33(4), 369-374. doi:10.1097/YCO.0000000000000609
- Meerwijk, E. L., Parekh, A., Oquendo, M. A., Allen, I., Franck, L. S., & Lee, K. A. (2016). Direct versus indirect psychosocial and behavioural interventions to prevent suicide and suicide attempts: A systematic review and meta-analysis. *The Lancet Psychiatry*, 3(6), 544-554.
- Melia, R., Francis, K., Hickey, E., Bogue, J., Duggan, J., O'Sullivan, M., & Young, K. (2020). Mobile Health Technology Interventions for Suicide Prevention: Systematic Review. *JMIR MHealth and UHealth*, 8(1), e12516.
- Mendez-Bustos, P., Calati, R., Rubio-Ramirez, F., Olie, E., Courtet, P., & Lopez-Castroman, J. (2019). Effectiveness of psychotherapy on suicidal risk: A systematic review of observational studies. *Frontiers in Psychology*, 10. doi:10.3389/fpsyg.2019.00277
- Mew, E. J., Padmanathan, P., Konradsen, F., Eddleston, M., Chang, S. S., Phillips, M. R., & Gunnell, D. (2017). The global burden of fatal self-poisoning with pesticides 2006-15: Systematic review. *Journal of Affective Disorders*, 219, 93-104.
- Mewton, L., & Andrews, G. (2016). Cognitive behavioral therapy for suicidal behaviors: Improving patient outcomes. *Psychology Research and Behavior Management Vol 9 2016, ArtID 21-29*, 9.
- Milner, A., Carter, G., Pirkis, J., Robinson, J., & Spittal, M. J. (2015a). Letters, green cards, telephone calls and postcards: systematic and meta-analytic review of brief contact interventions for reducing self-harm, suicide attempts and suicide. *British Journal of Psychiatry*, 206(3), 184-190. doi:10.1192/bjp.bp.114.147819
- Milner, A., Page, K., Spencer-Thomas, S., & Lamotagne, A. D. (2015b). Workplace suicide prevention: a systematic review of published and unpublished activities. *Health Promotion International*, 30(1), 29-37.
- Milner, A., Witt, K. G., Pirkis, J., Hetrick, S. E., Robinson, J., Currier, D., Spittal, M. J., Page, A., & Carter, G. L. (2017). The effectiveness of suicide prevention delivered by GPs: A systematic review and meta-analysis. *Journal of Affective Disorders*, 210, 294-302. doi:10.1016/j.jad.2016.12.035
- Ministry of Health. (2019). *Every Life Matters - He Tapu te Oranga o ia Tangata: Suicide Prevention Strategy 2019–2029 and Suicide Prevention Action Plan 2019–2024 for Aotearoa New Zealand*. Retrieved from Wellington:
- Ministry of Health. (2021a). *Mental Health Infrastructure Programme*. Retrieved from Wellington: <https://www.health.govt.nz/our-work/health-infrastructure-unit-hiu/mental-health-infrastructure-programme>

- Ministry of Health. (2021b). Suicide Web Tool. Retrieved from <https://www.health.govt.nz/publication/suicide-web-tool>
- Ministry of Health. (2021c). *Suicide Data related to Mental Health Service Users (2018)*. Retrieved from Wellington:
- Ministry of Health. (2022). Suicide web tool. Retrieved from <https://minhealthnz.shinyapps.io/suicide-web-tool/>
- Ministry of Health. (2024). Suicide data web tool. Retrieved from <https://tewhatauora.shinyapps.io/suicide-web-tool/>
- Mo, P. K., Ko, T. T., & Xin, M. Q. (2018). School-based gatekeeper training programmes in enhancing gatekeepers' cognitions and behaviours for adolescent suicide prevention: A systematic review. *Child and Adolescent Psychiatry and Mental Health*, 12. doi:10.1186/s13034-018-0233-4
- Morken, I. S., Dahlgren, A., Lunde, I., & Toven, S. (2019). The effects of interventions preventing self-harm and suicide in children and adolescents: an overview of systematic reviews. *J FResearch*, 8. doi:10.12688/f1000research.19506.2
- Morken, I. S., Dahlgren, A., Lunde, I., & Toven, S. (2020). The effects of interventions preventing self-harm and suicide in children and adolescents: An overview of systematic reviews. *F1000Research*, 8. doi:10.12688/f1000research.19506.2
- Morton, M., Wang, S., Tse, K., Chung, C., Bergmans, Y., Ceniti, A., Flam, S., Johannes, R., Schade, K., Terah, F., & Rizvi, S. (2021). Gatekeeper training for friends and family of individuals at risk of suicide: A systematic review. *Journal of Community Psychology*, 49(6), 1838-1871.
- Murray, R. M., Conroy, E., Connolly, M., Stokes, D., Frazer, K., & Kroll, T. (2021). Scoping Review: Suicide Specific Intervention Programmes for People Experiencing Homelessness. *International Journal of Environmental Research & Public Health*, 18(13), 6729. doi:10.3390/ijerph18136729
- Nasir, B. F., Hides, L., Kisely, S., Ranmuthugala, G., Nicholson, G. C., Black, E., Gill, N., Kondalsamy-Chennakesavan, S., & Toombs, M. (2016). The need for a culturally-tailored gatekeeper training intervention program in preventing suicide among Indigenous peoples: a systematic review. *BMC Psychiatry*, 16(1), 357.
- Navin, K., Kuppili, P. P., Menon, V., & Kattimani, S. (2019). Suicide Prevention Strategies for General Hospital and Psychiatric Inpatients: A Narrative Review. *Indian J Psychol Med*, 41(5), 403-412. doi:10.4103/ijpsym.Ijpsym\_169\_19
- Nawaz, R. F., Reen, G., Bloodworth, N., Maughan, D., & Vincent, C. (2021). Interventions to reduce self-harm on in-patient wards: Systematic review. *BJPsych open*, 7(3). doi:10.1192/bjo.2021.41
- Nelson, H. D., Denneson, L. M., Low, A. R., Bauer, B. W., O'Neil, M., Kansagara, D., & Teo, A. R. (2017). Suicide Risk Assessment and Prevention: A Systematic Review Focusing on Veterans. *Psychiatric Services*, 68(10), 1003-1015.
- Ngā Pou Arawhenua, Child and Youth Mortality Review Committee, & Suicide Mortality Review Committee. (2020). *Te Mauri. The lifeforce. Rangatahi suicide report. Te pu-rongo mo-te mate whakamomori o te rangatahi*. Retrieved from Wellington:
- NICE. (2022). *Self-harm: assessment, management and preventing recurrence. NICE Guideline*. Retrieved from England: [www.nice.org.uk/guidance/ng225](http://www.nice.org.uk/guidance/ng225)
- Niederkrotenthaler, T., Voracek, M., Herberth, A., Till, B., Strauss, M., Etzersdorfer, E., Eisenwort, B., & Sonneck, G. (2010). Papageno v Werther effect. *BMJ*, 341. doi:10.1136/bmj.c5841
- Noh, D., Park, Y.-S., & Oh, E. G. (2016). Effectiveness of telephone-delivered interventions following suicide attempts: A systematic review. *Archives of Psychiatric Nursing*, 30(1), 114-119.
- Norstrom, T., & Rossow, I. (2016). Alcohol Consumption as a Risk Factor for Suicidal Behavior: A Systematic Review of Associations at the Individual and at the Population Level. *Archives of Suicide Research*, 20(4), 489-506.
- Nuij, C., Van Ballegooijen, W., De Beurs, D., Juniar, D., Erlangsen, A., Portzky, G., O'Connor, R. C., Smit, J. H., Kerkhof, A., & Riper, H. (2021). Safety planning-type interventions for suicide prevention: Meta-analysis. *British Journal of Psychiatry*, 219(2), 419-426. doi:10.1192/bjp.2021.50

- O'Connor, E., Gaynes, B. N., Burda, B. U., Soh, C., & Whitlock, E. P. (2013). Screening for and treatment of suicide risk relevant to primary care: a systematic review for the U.S. Preventive Services Task Force. *Annals of Internal Medicine*, 158(10), 741-754.
- Okamura, K., Ikeshita, K., Kimoto, S., Makinodan, M., & Kishimoto, T. (2021). Suicide prevention in Japan: Government and community measures, and high-risk interventions. *Asia-Pacific psychiatry : Official Journal of the Pacific Rim College of Psychiatrists*, 13(3), e12471.
- Okolie, C., Dennis, M., Simon Thomas, E., & John, A. (2017). A systematic review of interventions to prevent suicidal behaviors and reduce suicidal ideation in older people. *International Psychogeriatrics*, 29(11), 1801-1824.
- Okolie, C., Hawton, K., Lloyd, K., Price, S. F., Dennis, M., & John, A. (2020a). Means restriction for the prevention of suicide on roads. *Cochrane Database of Systematic Reviews*, 9, CD013738.
- Okolie, C., Wood, S., Hawton, K., Kandalama, U., Glendenning, A. C., Dennis, M., Price, S. F., Lloyd, K., & John, A. (2020b). Means restriction for the prevention of suicide by jumping. *Cochrane Database of Systematic Reviews*, 2, CD013543.
- Oliver, P., Spee, K., Akroyd, S., Wolfgramm, T., & Ignite Research. (2015). *Evaluation of the Suicide Prevention Gatekeeper Training Programmes*. Retrieved from Waiheke Island, :
- Onie, S., Li, X., Liang, M., Sowmya, A., & Larsen, M. E. (2021). The use of closed-circuit television and video in suicide prevention: narrative review and future directions. *JMIR Mental Health*, 8(5). doi:10.2196/27663
- Ougrin, D., & Latif, S. (2011). Specific psychological treatment versus treatment as usual in adolescents with self-harm: systematic review and meta-analysis. *Crisis: Journal of Crisis Intervention & Suicide*, 32(2), 74-80.
- Ougrin, D., Tranah, T., Stahl, D., Moran, P., & Asarnow, J. R. (2015). Therapeutic interventions for suicide attempts and self-harm in adolescents: systematic review and meta-analysis. *Journal of the American Academy of Child Adolescent Psychiatry*, 54(2), 97-107. doi:10.1016/j.jaac.2014.10.009
- Ouzzani, M., Hammady, H., Fedorowicz, Z., & Elmagarmid, A. (2016). Rayyan — a web and mobile app for systematic reviews. *Systematic Reviews* 5(210). doi:10.1186/s13643-016-0384-4.
- Padmanathan, P., Hall, K., Moran, P., Jones, H. E., Gunnell, D., Carlisle, V., Lingford-Hughes, A., & Hickman, M. (2020). Prevention of suicide and reduction of self-harm among people with substance use disorder: A systematic review and meta-analysis of randomised controlled trials. *Comprehensive Psychiatry*, 96, 152135.
- Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., McGuinness, L. A., Stewart, L. A., Thomas, J., Tricco, A. C., Welch, V. A., Whiting, P., & Moher, D. (2021). The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *Systematic Reviews*, 10(1), 89. doi:10.1186/s13643-021-01626-4
- Patel, V., Chisholm, D., Dua, T., R. Laxminarayan, & Medina-Mora, M. E. (2015). *Mental, Neurological, and Substance Use Disorders. Disease Control Priorities* (Third ed. Vol. 4). Washington DC: World Bank.
- Penney, L., & Dobbs, T. (2014). *Promoting Whānau and Youth Resilience in Te Tai Tokerau: Evaluation of the Northland District Health Board Youth Suicide Prevention Project*. Retrieved from Kerikeri:
- Pirkis, J., Blood, W., Sutherland, G., & Currier, D. (2019a). *Suicide and the entertainment media: A critical review*. Retrieved from Australia:
- Pirkis, J., Gunnell, D., Shin, S., DelPozo-Banos, M., Arya, V., Analuisa Aguilar, P., Appleby, L., Arafat, S. M., Arensman, E., & Ayuso-Mateos, J. L. (2022). Did Suicide Numbers Diverge from Pre-Existing Trends During the First 9-15 Months of the COVID-19 Pandemic? Interrupted Time Series Analyses of Total and Sex-and Age-Specific Suicide Counts in 33 Countries. doi:10.2139/ssrn.4066503
- Pirkis, J., John, A., Shin, S., DelPozo-Banos, M., Arya, V., Analuisa-Aguilar, P., Appleby, L., Arensman, E., Bantjes, J., Baran, A., Bertolote, J. M., Borges, G., Brečić, P., Caine, E., Castelpietra, G., Chang, S. S., Colchester, D., Crompton, D., Curkovic, M., Deisenhammer, E. A., Du, C., Dwyer, J., Erlangsen, A.,

- Faust, J. S., Fortune, S., Garrett, A., George, D., Gerstner, R., Gilissen, R., Gould, M., Hawton, K., Kanter, J., Kapur, N., Khan, M., Kirtley, O. J., Knipe, D., Kolves, K., Leske, S., Marahatta, K., Mittendorfer-Rutz, E., Neznanov, N., Niederkrotenthaler, T., Nielsen, E., Nordentoft, M., Oberlerchner, H., O'Connor, R. C., Pearson, M., Phillips, M. R., Platt, S., Plener, P. L., Psota, G., Qin, P., Radeloff, D., Rados, C., Reif, A., Reif-Leonhard, C., Rozanov, V., Schlang, C., Schneider, B., Semenova, N., Sinyor, M., Townsend, E., Ueda, M., Vijayakumar, L., Webb, R. T., Weerasinghe, M., Zalsman, G., Gunnell, D., & Spittal, M. J. (2021). Suicide trends in the early months of the COVID-19 pandemic: an interrupted time-series analysis of preliminary data from 21 countries. *Lancet Psychiatry*, 8(7), 579-588. doi:10.1016/s2215-0366(21)00091-2
- Pirkis, J., Rossetto, A., Nicholas, A., Ftanou, M., Robinson, J., & Reavley, N. (2019b). Suicide Prevention Media Campaigns: A Systematic Literature Review. *Health Communication*, 34(4), 402-414.
- Pirkis, J., Spittal, M. J., Cox, G., Robinson, J., Cheung, Y. T., & Studdert, D. (2013). The effectiveness of structural interventions at suicide hotspots: a meta-analysis. *International Journal of Epidemiology*, 42(2), 541-548.
- Pirkis, J., Too, L. S., Spittal, M. J., Kryszynska, K., Robinson, J., & Cheung, Y. T. (2015). Interventions to reduce suicides at suicide hotspots: a systematic review and meta-analysis. *The Lancet. Psychiatry*, 2(11), 994-1001.
- Pistone, I., Beckman, U., Eriksson, E., Lagerlof, H., & Sager, M. (2019). The effects of educational interventions on suicide: A systematic review and meta-analysis. *International Journal of Social Psychiatry*, 65(5), 399-412.
- Polihronis, C., Cloutier, P., Kaur, J., Skinner, R., & Cappelli, M. (2020). What's the harm in asking? A systematic review and meta-analysis on the risks of asking about suicide-related behaviors and self-harm with quality appraisal. *Archives of suicide research : official journal of the International Academy for Suicide Research*, 1-23.
- Pollock, N. J., Apok, C., Concepcion, T., Delgado, R. A., Rasmus, S., Chatwood, S., & Collins, P. Y. (2020). Global goals and suicide prevention in the Circumpolar North. *Indian Journal of Psychiatry*, 62(1), 7-14. doi:10.4103/psychiatry.IndianJPsychiatry\_717\_19
- Pompili, M., Venturini, P., Lamis, D. A., Giordano, G., Serafini, G., Belvederi Murri, M., Amore, M., & Girardi, P. (2015). Suicide in stroke survivors: epidemiology and prevention. *Drugs & Aging*, 32(1), 21-29. doi:10.1007/s40266-014-0233-x
- Quinlivan, L., Cooper, J., Davies, L., Hawton, K., Gunnell, D., & Kapur, N. (2016). Which are the most useful scales for predicting repeat self-harm? A systematic review evaluating risk scales using measures of diagnostic accuracy. *BMJ Open*, 6(2), e009297.
- Raj, S., Ghosh, D., Verma, S. K., & Singh, T. (2021). The mindfulness trajectories of addressing suicidal behaviour: A systematic review. *International Journal of Social Psychiatry*, 67(5), 507-519.
- Ramsey, C., Galway, K., & Davidson, G. (2021). Implementing changes after patient suicides in mental health services: A systematic review. *Health & social care in the community*, 24.
- Redvers, J., Bjerregaard, P., Eriksen, H., Fanian, S., Healey, G., Hiratsuka, V., Jong, M., Larsen, C. V., Linton, J., Pollock, N., Silvikien, A., Stoor, P., & Chatwood, S. (2015). A scoping review of Indigenous suicide prevention in circumpolar regions. *International Journal of Circumpolar Health*, 74, 27509.
- Reifels, L., Mishara, B. L., Dargis, L., Vijayakumar, L., Phillips, M. R., & Pirkis, J. (2019). Outcomes of Community-Based Suicide Prevention Approaches That Involve Reducing Access to Pesticides: A Systematic Literature Review. *Suicide & Life-Threatening Behavior*, 49(4), 1019-1031.
- Reinstatler, L., & Youssef, N. A. (2015). Ketamine as a potential treatment for suicidal ideation: a systematic review of the literature. *Drugs in R & D*, 15(1), 37-43.
- Ribeiro, J. D., Franklin, J. C., Fox, K. R., Bentley, K. H., Kleiman, E. M., Chang, B. P., & Nock, M. K. (2016). Self-injurious thoughts and behaviors as risk factors for future suicide ideation, attempts, and death: a meta-analysis of longitudinal studies. *Psychological Medicine*, 46(2), 225-236. doi:10.1017/S0033291715001804

- Riblet, N. B. V., Shiner, B., Young-Xu, Y., & Watts, B. V. (2017). Strategies to prevent death by suicide: meta-analysis of randomised controlled trials. *British Journal of Psychiatry*, *210*(6), 396-402.
- Ridani, R., Shand, F. L., Christensen, H., McKay, K., Tighe, J., Burns, J., & Hunter, E. (2015). Suicide prevention in Australian Aboriginal communities: a review of past and present programs. *Suicide & Life-Threatening Behavior*, *45*(1), 111-140.
- Robinson, J., Bailey, E., Witt, K. G., Stefanac, N., Milner, A., Currier, D., Pirkis, J., Condrón, P., & Hetrick, S. E. (2018a). What works in youth suicide prevention? A systematic review and meta-analysis. *Journal of eClinical Medicine*, *4*, 52-91. doi:10.1016/j.eclinm.2018.10.004
- Robinson, J., Calear, A. L., & Bailey, E. (2018b). Suicide prevention in educational settings: a review. *Australasian Psychiatry*, *26*(2), 132-140.
- Robinson, J., Cox, G., Malone, A., Williamson, M., Baldwin, G., Fletcher, K., & O'Brien, M. (2013). A systematic review of school-based interventions aimed at preventing, treating, and responding to suicide-related behavior in young people. *Crisis: Journal of Crisis Intervention & Suicide*, *34*(3), 164-182.
- Rojas, S. M., Carter, S. P., McGinn, M. M., & Reger, M. A. (2020). A Review of Telemental Health as a Modality to Deliver Suicide-Specific Interventions for Rural Populations. *Telemedicine Journal & E-Health*, *26*(6), 700-709.
- Rostami, M., Rahmati-Najarkolaei, F., Salehi, M., & Azad, E. (2021). A Systematic Review of Suicide Prevention Interventions in Military Personnel. *Archives of suicide research : official journal of the International Academy for Suicide Research*, 1-19.
- Rowe, S. L., French, R. S., Henderson, C., Ougrin, D., Slade, M., & Moran, P. (2014). Help-seeking behaviour and adolescent self-harm: a systematic review. *J Australian New Zealand Journal of Psychiatry*, *48*(12), 1083-1095. doi:10.1177/0004867414555718
- Rozek, D. C., Baker, S. N., Rugo, K. F., Steigerwald, V. L., Sippel, L. M., Holliday, R., Roberge, E. M., Held, P., Mota, N., & Smith, N. B. (2021). Addressing co-occurring suicidal thoughts and behaviors and posttraumatic stress disorder in evidence-based psychotherapies for adults: A systematic review. *J Trauma Stress*. doi:10.1002/jts.22774
- Runeson, B., Odeberg, J., Pettersson, A., Edbom, T., Adamsson, I. J., & Waern, M. (2017). Instruments for the assessment of suicide risk: A systematic review evaluating the certainty of the evidence. *PLoS One*, *12*(7). doi:10.1371/journal.pone.0180292
- Russell, D. H., Trew, S., & Higgins, D. J. (2021). Vulnerable yet forgotten? A systematic review identifying the lack of evidence for effective suicide interventions for young people in contact with child protection systems. *American Journal of Orthopsychiatry*, *91*(5), 647-659.
- Russon, J., Morrissey, J., Dellinger, J., Jin, B., & Diamond, G. (2021a). Implementing attachment-based family therapy for depressed and suicidal adolescents and young adults in LGBTQ+ services: Feasibility, acceptability, and preliminary effectiveness. *Crisis: The Journal of Crisis Intervention and Suicide Prevention*. doi:10.1027/0227-5910/a000821
- Russon, J., Washington, R., Machado, A., Smithee, L., & Dellinger, J. (2021b). Suicide among LGBTQIA+ youth: A review of the treatment literature. *Aggression and Violent Behavior*. doi:10.1016/j.avb.2021.101578
- Saab, M. M., Murphy, M., Meehan, E., Dillon, C. B., O'Connell, S., Hegarty, J., Heffernan, S., Greaney, S., Kilty, C., Goodwin, J., Hartigan, I., O'Brien, M., Chambers, D., Twomey, U., & O'Donovan, A. (2021). Suicide and Self-Harm Risk Assessment: A Systematic Review of Prospective Research. *Archives of suicide research : official journal of the International Academy for Suicide Research*, 1-21.
- Sakinofsky, I. (2014). Preventing suicide among inpatients. *Can J Psychiatry*, *59*(3), 131-140. doi:10.1177/070674371405900304
- Sarchiapone, M., Mandelli, L., Iosue, M., Andrisano, C., & Roy, A. (2011). Controlling access to suicide means. *International Journal of Environmental Research & Public Health*, *8*(12), 4550-4562. doi:10.3390/ijerph8124550

- Saunders, K. E., & Smith, K. A. (2016). Interventions to prevent self-harm: what does the evidence say? *Evidence-Based Mental Health, 19*(3), 69-72.
- Scarth, B., Pavlova, A., Hetrick, S. E., Witt, K. G., Hawton, K., & Fortune, S. (2021). Service users' experiences of emergency care following an episode of self-harm: a mixed evidence synthesis. *Cochrane Database of Systematic Reviews, 2021*(12) (no pagination).
- Schlichthorst, M., Ozols, I., Reifels, L., & Morgan, A. (2020). Lived experience peer support programs for suicide prevention: A systematic scoping review. *International Journal of Mental Health Systems, 14*(1). doi:10.1186/s13033-020-00396-1
- Schmelefske, E., Per, M., Khoury, B., & Heath, N. (2020). The Effects of Mindfulness-Based Interventions on Suicide Outcomes: A Meta-Analysis. *Archives of suicide research: Official journal of the International Academy for Suicide Research, 1-18*. doi:10.1080/13811118.2020.1833796
- Serafini, G., Adavastro, G., Canepa, G., De Berardis, D., Valchera, A., Pompili, M., Nasrallah, H., & Amore, M. (2018). The Efficacy of Buprenorphine in Major Depression, Treatment-Resistant Depression and Suicidal Behavior: A Systematic Review. *International Journal of Molecular Sciences, 19*(8), 15.
- Serafini, G., Canepa, G., Aguglia, A., Amerio, A., Bianchi, D., Magnani, L., Dell'Osso, B., Pompili, M., Fitzgerald, P. B., & Amore, M. (2021). Effects of repetitive transcranial magnetic stimulation on suicidal behavior: A systematic review. *Progress in Neuro-Psychopharmacology & Biological Psychiatry, 105*, 109981.
- Shand, F., Duffy, L., & Torok, M. (2021). Can Government Responses to Unemployment Reduce the Impact of Unemployment on Suicide? *Crisis, 43*(1), 1-8. doi:10.1027/0227-5910/a000750
- Siegel, A. N., Di Vincenzo, J. D., Brietzke, E., Gill, H., Rodrigues, N. B., Lui, L. M., Teopiz, K. M., Ng, J., Ho, R., McIntyre, R. S., & Rosenblat, J. D. (2021). Antisuicidal and antidepressant effects of ketamine and esketamine in patients with baseline suicidality: A systematic review. *Journal of Psychiatric Research, 137*, 426-436.
- Skegg, K., & Herbison, P. (2009). Effect of restricting access to a suicide jumping site. *Aust N Z J Psychiatry, 43*, 498-502.
- Smith, K. A., & Cipriani, A. (2017). Lithium and suicide in mood disorders: Updated meta-review of the scientific literature. *Bipolar Disorders, 19*(7), 575-586.
- Sobanski, T., Jوسفeld, S., Peikert, G., & Wagner, G. (2021). Psychotherapeutic interventions for the prevention of suicide re-attempts: a systematic review. *Psychological medicine, 1-16*.
- Sonke, J., Sams, K., Morgan-Daniel, J., Pumariega, A., Mallick, F., Pesata, V., & Olsen, N. (2021). Systematic Review of Arts-Based Interventions to Address Suicide Prevention and Survivorship in Australia, Canada, the United Kingdom, and the United States of America. *Health Promotion Practice, 22*(1), 53S-63S. doi:10.1177/1524839921996350
- Soomro, G. M., & Kakhi, S. (2015). Deliberate self-harm (and attempted suicide). *Clinical Evidence, 28*, 28.
- Stack, S. (2020). Media guidelines and suicide: A critical review. *Social Science & Medicine, 262*, 112690.
- Stefanopoulou, E., Hogarth, H., Taylor, M., Russell-Haines, K., Lewis, D., & Larkin, J. (2020). Are digital interventions effective in reducing suicidal ideation and self-harm? A systematic review. *Journal of mental health, 29*(2), 207-216. doi:10.1080/09638237.2020.1714009
- Stewart, I., & Lees-Deutsch, L. (2022). Risk Assessment of Self-Injurious Behavior and Suicide Presentation in the Emergency Department: An Integrative Review. *Journal of Emergency Nursing, 48*(1), 57-73. doi:10.1016/j.jen.2021.10.002
- Struszczyk, S., Galdas, P. M., & Tiffin, P. A. (2019). Men and suicide prevention: a scoping review. *Journal of Mental Health, 28*(1), 80-88.
- Suicide Mortality Review Committee. (2016). *Ngā Rāhui Hau Kura. Suicide Mortality Review Committee. Feasibility Study 2014-15*. Retrieved from Wellington: <https://www.hqsc.govt.nz/assets/SUMRC/PR/SuMRC-full-report-May-2016.pdf>



- Suicide Mortality Review Committee. (2019). *Suicide post-vention: An example 'Fusion', Te Tai Tokerau*. Retrieved from Wellington: <https://www.hqsc.govt.nz/assets/Our-work/Mortality-review-committee/SuMRC/Publications-resources/Suicide-post-vention-Fusion-final.pdf>
- Sullivan, S. R., Monahan, M. F., Mitchell, E. L., Spears, A. P., Walsh, S., Szeszko, J. R., Gromatsky, M., Stanley, B., & Goodman, M. (2021a). Group treatments for individuals at risk for suicide: A PRISMA scoping review (ScR). *Psychiatry Research*, *304*, 114108. doi:10.1016/j.psychres.2021.114108
- Sullivan, S. R., Spears, A. P., Mitchell, E. L., Walsh, S., Love, C., & Goodman, M. (2021b). Family treatments for individuals at risk for suicide: A PRISMA scoping review. *Crisis: The Journal of Crisis Intervention and Suicide Prevention*. doi:10.1027/0227-5910/a000828
- SUMRC, Child and Youth Mortality Review Committee, & Nga Pou Arawhenua. (2020). *Te Mauri The Life Force I Rangatahi suicide report I Te pūrongo mō te mate whakamomori o te rangatahi*. Retrieved from Wellington:
- Surgenor, P. W. G., Quinn, P., & Hughes, C. (2016). Ten recommendations for effective school-based, adolescent, suicide prevention programs. *J School Mental Health*, *8*(4), 413-424. doi:10.1007/s12310-016-9189-9
- Swift, J. K., Trusty, W. T., & Penix, E. A. (2021). The effectiveness of the Collaborative Assessment and Management of Suicidality (CAMS) compared to alternative treatment conditions: A meta-analysis. *Suicide & Life-Threatening Behavior*, *51*(5), 882-896.
- Szlyk, H., & Tan, J. (2020). The Role of Technology and the Continuum of Care for Youth Suicidality: Systematic Review. *Journal of Medical Internet Research*, *22*(10), e18672.
- Szumilas, M., & Kutcher, S. (2011). Post-suicide intervention programs: a systematic review. *Canadian Journal of Public Health*, *102*(1), 18-19. doi:10.1007/BF03404872
- Thornicroft, G., Mehta, N., Clement, S., Evans-Lacko, S., Doherty, M., Rose, D., Koschorke, M., Shidhaye, R., O'Reilly, C., & Henderson, C. (2016). Evidence for effective interventions to reduce mental-health-related stigma and discrimination. *The Lancet*, *387*(10023), 1123-1132. doi:10.1016/S0140-6736(15)00298-6
- Tiatia-Seath, J. (2016). *Suicide Postvention: Support for Pacific Communities. Report for Waka Hourua - National Suicide Prevention Programme for Māori and Pasifika Communities*. Retrieved from <https://researchspace.auckland.ac.nz/bitstream/handle/2292/32391/Hibiscus%20Research%20-%20Pacific%20Suicide%20Postvention%20Final%20Report%20%28Tiatia-Seath%29.pdf?sequence=16&isAllowed=y>
- Tighe, J., Nicholas, J., Shand, F., & Christensen, H. (2018). Efficacy of Acceptance and Commitment Therapy in Reducing Suicidal Ideation and Deliberate Self-Harm: Systematic Review. *JMIR Ment Health*, *5*(2), e10732. doi:10.2196/10732
- Timberlake, L. M., Beeber, L. S., & Hubbard, G. (2020). Nonsuicidal Self-Injury: Management on the Inpatient Psychiatric Unit. *J Am Psychiatr Nurses Assoc*, *26*(1), 10-26. doi:10.1177/1078390319878878
- Tondo, L., & Baldessarini, R. J. (2018). Antisuicidal Effects in Mood Disorders: Are They Unique to Lithium? *Pharmacopsychiatry*, *51*(5), 177-188. doi:10.1055/a-0596-7853
- Torok, M., Calear, A. L., Shand, F., & Christensen, H. (2017). A Systematic Review of Mass Media Campaigns for Suicide Prevention: Understanding Their Efficacy and the Mechanisms Needed for Successful Behavioral and Literacy Change. *Suicide & Life-Threatening Behavior*, *47*(6), 672-687. doi:10.1111/sltb.12324
- Torok, M., Calear, A. L., Smart, A., Nicolopoulos, A., & Wong, Q. (2019). Preventing adolescent suicide: A systematic review of the effectiveness and change mechanisms of suicide prevention gatekeeping training programs for teachers and parents. *Journal of Adolescence*, *73*, 100-112.
- Torok, M., Han, J., Baker, S., Werner-Seidler, A., Wong, I., Larsen, M. E., & Christensen, H. (2020). Suicide prevention using self-guided digital interventions: a systematic review and meta-analysis of randomised controlled trials. *The Lancet. Digital Health*, *2*(1), e25-e36.
- Turecki, G., & Brent, D. A. (2016). Suicide and suicidal behaviour. *Lancet*, *387*(10024), 1227-1239. doi:10.1016/s0140-6736(15)00234-2

- Turner, B. J., Austin, S. B., & Chapman, A. L. (2014). Treating nonsuicidal self-injury: a systematic review of psychological and pharmacological interventions. *Canadian Journal of Psychiatry - Revue Canadienne de Psychiatrie*, 59(11), 576-585.
- van Der Feltz-Cornelis, C. M., Sarchiapone, M., Postuvan, V., Volker, D., Roskar, S., Grum, A. T., Carli, V., McDaid, D., O'Connor, R., & Maxwell, M. (2011). Best practice elements of multilevel suicide prevention strategies. *J Crisis*, 32(6), 319–333. doi:10.1027/0227-5910/a000109
- Villarreal-Otalora, T., Jennings, P., & Mowbray, O. (2019). Clinical interventions to reduce suicidal behaviors in Hispanic adolescents: A scoping review. *Research on Social Work Practice*, 29(8), 924-938.
- Vita, A., De Peri, L., & Sacchetti, E. (2015). Lithium in drinking water and suicide prevention: a review of the evidence. *International Clinical Psychopharmacology*, 30(1), 1-5.
- Waiti, J. (2016). *Successful initiatives to strengthening the protective factors for suicide prevention amongst tāne Māori – A Review of Literature*. Retrieved from Wellington: [https://centreformaorisuicideprevention.com/wp-content/uploads/2019/03/Te\\_Pa%CC%84tu%CC%84tu%CC%84\\_Oranga\\_FINAL\\_30.03.17.pdf](https://centreformaorisuicideprevention.com/wp-content/uploads/2019/03/Te_Pa%CC%84tu%CC%84tu%CC%84_Oranga_FINAL_30.03.17.pdf)
- Wallace, M., Miller, V. J., Fields, N. L., Xu, L., & Mercado-Sierra, M. A. (2021). Empirically Evaluated Suicide Prevention Program Approaches for Older Adults: A Review of the Literature from 2009-2021. *Journal of Gerontological Social Work*, 64(5), 480-498.
- Wasserman, D., Carli, V., Iosue, M., Javed, A., & Herrman, H. (2021). Suicide prevention in childhood and adolescence: a narrative review of current knowledge on risk and protective factors and effectiveness of interventions. *J Asia-Pacific Psychiatry*, 13(3), e12452. doi:10.1111/appy.12452
- Wei, Y., Kutcher, S., & LeBlanc, J. C. (2015). Hot idea or hot air: A systematic review of evidence for two widely marketed youth suicide prevention programs and recommendations for implementation. *Journal of the Canadian Academy of Child and Adolescent Psychiatry*, 24(1), 5-16.
- Wilcox, H. C., Kharrazi, H., Wilson, R. F., Musci, R. J., Susukida, R., Gharghabi, F., Zhang, A., Wissow, L., & Robinson, K. A. (2016). Data Linkage Strategies to Advance Youth Suicide Prevention: A Systematic Review for a National Institutes of Health Pathways to Prevention Workshop. *Annals of Internal Medicine*, 165(11), 779-785.
- Wilkinson, S. T., Ballard, E. D., Bloch, M. H., Mathew, S. J., Murrough, J. W., Feder, A., Sos, P., Wang, G., Zarate, C. A., Jr., & Sanacora, G. (2018). The Effect of a Single Dose of Intravenous Ketamine on Suicidal Ideation: A Systematic Review and Individual Participant Data Meta-Analysis. *American Journal of Psychiatry*, 175(2), 150-158.
- Wilkinson, S. T., Trujillo Diaz, D., Rupp, Z. W., Kidambi, A., Ramirez, K. L., Flores, J. M., Avila-Quintero, V. J., Rhee, T. G., Olfson, M., & Bloch, M. H. (2021). Pharmacological and somatic treatment effects on suicide in adults: A systematic review and meta-analysis. *Depression and Anxiety*, 39(2), 100-112. doi:10.1002/da.23222
- Wilson, M. P., Bryson, K., & Bartolo - Doblas, J. (2021a). *MATES in Construction New Zealand: A longitudinal assessment of suicide prevention programme for construction workers*. Retrieved from New Zealand: <https://mates.org.au/media/documents/MATES-in-Construction-NZ-A-longitudinal-assessment-of-suicide-prevention-programme-for-construction-workers.pdf>
- Wilson, M. P., Kaur, J., Blake, L., Oliveto, A. H., Thompson, R. G., Pyne, J. M., Wolf, L., Walker, A. P., Waliski, A. D., & Nordstrom, K. (2021b). Adherence to guideline creation recommendations for suicide prevention in the emergency department: A systematic review. *American Journal of Emergency Medicine*, 50, 553-560.
- Winicov, N. (2019). A systematic review of behavioral health interventions for suicidal and self-harming individuals in prisons and jails. *J Heliyon*, 5(9), e02379.
- Winter, D., Bradshaw, S., Bunn, F., & Wellsted, D. (2013). A systematic review of the literature on counselling and psychotherapy for the prevention of suicide: 1. Quantitative outcome and process studies. *Counselling & Psychotherapy Research*, 13(3), 164-183.

- Witt, K. G., Chitty, K. M., Wardhani, R., Varnik, A., de Leo, D., & Kolves, K. (2021a). Effect of alcohol interventions on suicidal ideation and behaviour: A systematic review and meta-analysis. *Drug & Alcohol Dependence*, 226, 108885. doi:10.1016/j.drugalcdep.2021.108885
- Witt, K. G., Hawton, K., Hetrick, S. E., Taylor Salisbury, T. L., Townsend, E., & Hazell, P. (2020a). Pharmacological interventions for self-harm in adults. *Cochrane Database of Systematic Reviews*, 7. doi:10.1002/14651858.CD013669.pub2
- Witt, K. G., Hetrick, S. E., Rajaram, G., Hazell, P., Taylor Salisbury, T. L., Townsend, E., & Hawton, K. (2021b). Interventions for self-harm in children and adolescents. *Cochrane Database of Systematic Reviews*(3). doi:10.1002/14651858.CD013667.pub2
- Witt, K. G., Hetrick, S. E., Rajaram, G., Hazell, P., Taylor Salisbury, T. L., Townsend, E., & Hawton, K. (2021c). Psychosocial interventions for self-harm in adults. *Cochrane Database of Systematic Reviews*, 4, CD013668.
- Witt, K. G., Milner, A., Allisey, A., Davenport, L., & LaMontagne, A. D. (2017a). Effectiveness of suicide prevention programs for emergency and protective services employees: A systematic review and meta-analysis. *American Journal of Industrial Medicine*, 60(4), 394-407. doi:10.1002/ajim.22676
- Witt, K. G., Potts, J., Hubers, A., Grunebaum, M. F., Murrough, J. W., Loo, C., Cipriani, A., & Hawton, K. (2020b). Ketamine for suicidal ideation in adults with psychiatric disorders: A systematic review and meta-analysis of treatment trials. *Australian & New Zealand Journal of Psychiatry*, 54(1), 29-45. doi:10.1177/0004867419883341
- Witt, K. G., Spittal, M. J., Carter, G., Pirkis, J., Hetrick, S. E., Currier, D., Robinson, J., & Milner, A. (2017b). Effectiveness of online and mobile telephone applications ('apps') for the self-management of suicidal ideation and self-harm: a systematic review and meta-analysis. *BMC Psychiatry*, 17(1), 297. doi:10.1186/s12888-017-1458-0
- Wolitzky-Taylor, K., LeBeau, R. T., Perez, M., Gong-Guy, E., & Fong, T. (2020). Suicide prevention on college campuses: What works and what are the existing gaps? A systematic review and meta-analysis. *Journal of American College Health*, 68(4), 419-429.
- Woodford, R., Spittal, M. J., Milner, A., McGill, K., Kapur, N., Pirkis, J., Mitchell, A., & Carter, G. (2019). Accuracy of Clinician Predictions of Future Self-Harm: A Systematic Review and Meta-Analysis of Predictive Studies. *Suicide & Life-Threatening Behavior*, 49(1), 23-40.
- World Health Organization. (2014). *Preventing suicide: a global imperative*. Retrieved from Switzerland:
- Wyart, M., Abbar, M., & Courtet, P. (2012). Preventing late life suicide: A review. *Minerva Psichiatrica*, 53(2), 123-131.
- Xiong, J., Lipsitz, O., Chen-Li, D., Rosenblat, J. D., Rodrigues, N. B., Carvalho, I., Lui, L. M. W., Gill, H., Narsi, F., Mansur, R. B., Lee, Y., & McIntyre, R. S. (2021). The acute antisuicidal effects of single-dose intravenous ketamine and intranasal esketamine in individuals with major depression and bipolar disorders: A systematic review and meta-analysis. *Journal of Psychiatric Research*, 134, 57-68.
- Xue, C., Yang, Y., Xu, K., Shi, X., & Liu, H. (2020). Health personnel-targeted education interventions on inpatient suicide prevention in general hospitals: A scoping review. *International journal of nursing sciences*. doi:10.1016/j.ijnss.2020.09.006
- Yerevanian, B. I., & Choi, Y. M. (2013). Impact of psychotropic drugs on suicide and suicidal behaviors. *Bipolar Disord*, 15(5), 594-621. doi:10.1111/bdi.12098
- Yiu, H. W., Rowe, S., & Wood, L. (2021). A systematic review and meta-analysis of psychosocial interventions aiming to reduce risks of suicide and self-harm in psychiatric inpatients. *Psychiatry Research*, 305. doi:10.1016/j.psychres.2021.114175
- Yonemoto, N., Kawashima, Y., Endo, K., & Yamada, M. (2019). Gatekeeper training for suicidal behaviors: A systematic review. *Journal of Affective Disorders*, 246, 506-514.
- Yu, T., Hu, D., Teng, F., Mao, J., Xu, K., Han, Y., Liu, Y., & Wu, M. (2021). Effectiveness of internet-based cognitive behavioral therapy for suicide: a systematic review and meta-analysis of RCTs. *Psychology, health & medicine*, 1-18.

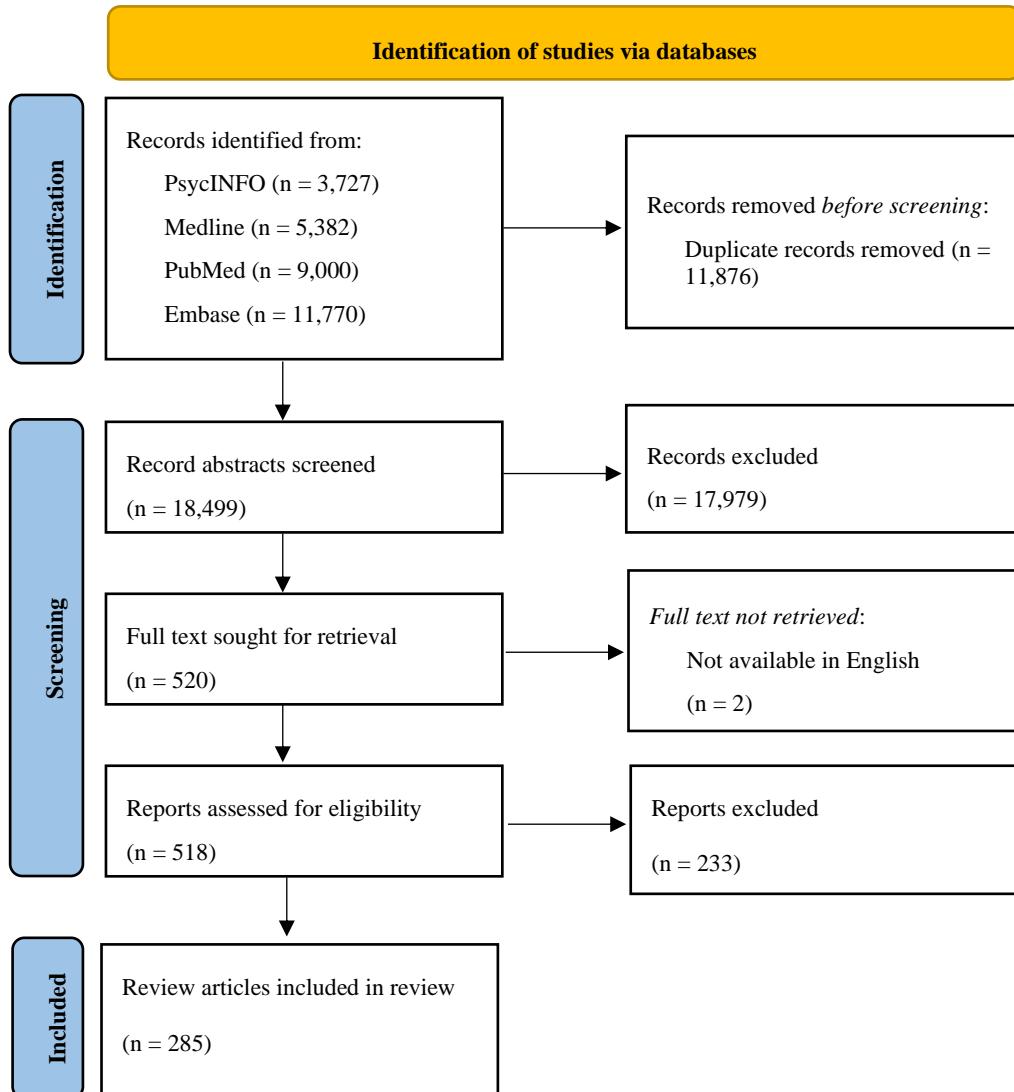
- Yuan, S. N. V., Kwok, K. H. R., & Ougrin, D. (2019). Treatment engagement in specific psychological treatment vs. treatment as usual for adolescents with self-harm: Systematic review and meta-analysis. *Frontiers in Psychology, 10*. doi:10.3389/fpsyg.2019.00104
- Zalsman, G., Hawton, K., Wasserman, D., van Heeringen, K., Arensman, E., Sarchiapone, M., Carli, V., Höschl, C., Barzilay, R., & Balazs, J. (2016). Suicide prevention strategies revisited: 10-year systematic review. *J The Lancet Psychiatry, 3*(7), 646-659. doi:10.1016/S2215-0366(16)30030-X
- Zeoli, A. M., Goldstick, J., Mauri, A., Wallin, M., Goyal, M., & Cunningham, R. (2019). The association of firearm laws with firearm outcomes among children and adolescents: a scoping review. *Journal of behavioral medicine, 42*(4), 741-762. doi:10.1007/s10865-019-00063-y
- Zeppegno, P., Gattoni, E., Mastrangelo, M., Gramaglia, C., & Sarchiapone, M. (2019). Psychosocial suicide prevention interventions in the elderly: A mini-review of the literature. *Frontiers in Psychology, 9*. doi:10.3389/fpsyg.2018.02713
- Zhang, R. W. (2021). Evidence-Based Suicide Screening and Prevention Protocol for Licensed Nursing Staff: A Systematic Literature Review and Recommendations. *Journal of psychosocial nursing and mental health services, 1-7*.

## Appendices

### Appendix A: PRISMA flow diagrams

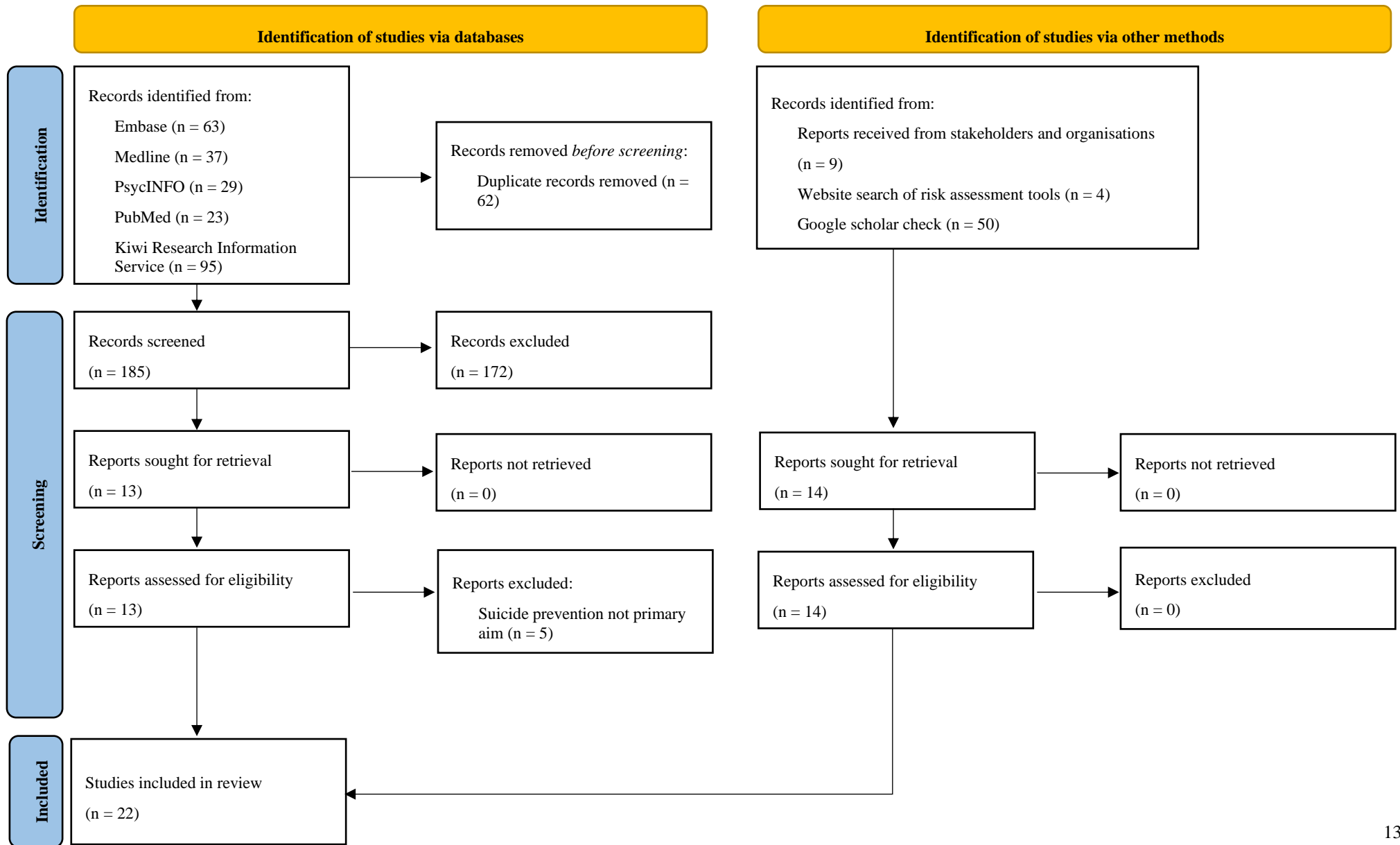
Figure 2

*Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flowchart of the literature search and review selection*



**Figure 3**

*PRISMA flowchart of the literature search and study selection for Aotearoa New Zealand, particularly Māori and Pacific*



## Appendix B: Summary table of included reviews

**Table 1**

### *Summary of included reviews*

<sup>a</sup> ACT = Acceptance and Commitment Therapy; ABFT = Attachment Based Family Therapy; AI = Artificial Intelligence; BP = Bipolar Disorder; BPD = Borderline Personality Disorder; CAMHS = Child and Adolescent Mental Health Services; CBT = Cognitive Behavioural Therapy; iCBT = Internet-Based Cognitive Behavioural Therapy; DBT = Dialectical Behavioural Therapy; ECT = Electroconvulsive Therapy; GPs = General Practitioners; IPT = Interpersonal Therapy; MBT = Mentalisation-Based Therapy; MDD = Major Depressive Disorder; ML = Machine Learning; MI = Motivational Interviewing; MBCT = Mindfulness Based Cognitive Therapy; MBSR = Mindfulness Based Stress Reduction; NA = Not Applicable; NSSI = Non-Suicidal Self-Injury; SA = Suicidal Attempt(s); SH = Self-Harm; SI = Suicidal Ideation; ST = Supportive Therapy; SSRIs = Selective Serotonin Reuptake Inhibitors; TRD = Treatment Resistant Depression; PST = Problem Solving Therapy; PTSD = Post Traumatic Stress Disorder

	<b>Study citation</b>	<b>Title</b>	<b>Type of analysis</b>	<b>Population characteristics</b>	<b>Setting</b>	<b>Level of intervention</b>	<b>Intervention type</b>	<b>Suicide-related primary outcome(s)</b>	<b>Quality impression</b>
1	(Abarca et al., 2018)	Literature review to identify standardized scales for assessing adult suicide risk in the primary health care setting	Comparative analysis	Adult outpatients	Primary care settings	Universal	Risk assessment instruments	Suicide risk	1 Low
2	(Aggarwal & Patton, 2018)	Engaging families in the management of adolescent self-harm	Narrative synthesis	Adolescents	Clinical settings	Indicated	Family-based interventions (including brief single session family interventions, intermediate-level family interventions, and intensive family interventions)	SA, SH, SI, and NSSI	3 Medium
3	(Airey & Iqbal, 2020)	Are Clinicians Confident in the Risk Assessment of Suicide?: A Systematic Literature Review	Narrative synthesis	Healthcare professionals	Clinical settings	Selective	Risk assessment instruments	Clinician confidence	3 Medium
4	(Allen, Wexler, & Rasmus, 2021)	Protective Factors as a Unifying Framework for	Narrative summary	American Indian and Alaska Native Indigenous	Mixed settings	Selective	Culturally informed intervention initiatives	NA (review of American Indian and Alaska Native Suicide	3 Medium

Study citation	Title	Type of analysis	Population characteristics	Setting	Level of intervention	Intervention type	Suicide-related primary outcome(s)	Quality impression	
	Strength-Based Intervention and Culturally Responsive American Indian and Alaska Native Suicide Prevention		children and adolescents				Prevention Framework)		
5	(Altavini et al., 2022)	Revisiting evidence of primary prevention of suicide among adult populations: A systematic overview	Narrative synthesis	General adult populations	Mixed settings	Universal	Mixed intervention types (including awareness and education, gatekeeper training, media reports, and means restriction)	Suicide death rates, and SA	5 High
6	(Andriessen et al., 2019a)	Effectiveness of interventions for people bereaved through suicide: A systematic review of controlled studies of grief, psychosocial and suicide-related outcomes	Narrative synthesis	People bereaved by suicide	Mixed settings	Selective	Postvention interventions (including group, family, and individual interventions)	SI and NSSI	5 High
7	(Andriessen et al., 2019c)	Suicide postvention service models and guidelines 2014-2019: A systematic review	Narrative synthesis	People bereaved by suicide	Mixed settings	Indicated	Mixed intervention types (including school-based interventions, intense grief psychotherapy programs, online support forums, crisis intervention, and intensive grief therapy programs)	Suicidality	5 High
8	(Arshad et al., 2020)	A Systematic Review of the Evidence Supporting Mobile- and Internet-Based	Meta-analysis	Adolescents and adults presenting with experiences of self-injurious thoughts and behaviours	Digital settings	Indicated	Psychotherapy interventions (including CBT, DBT, individual emotion-regulation therapy, and coping skill interventions)	NSSI	5 High



Study citation	Title	Type of analysis	Population characteristics	Setting	Level of intervention	Intervention type	Suicide-related primary outcome(s)	Quality impression
	Psychological Interventions For Self-Harm							
9 (Audouard-Marzin et al., 2019)	General practitioners training about suicide prevention and risk: A systematic review of literature	Narrative summary	Healthcare professionals (including GPs, nurses, social workers, psychiatrists, psychologists, counsellors, and occupational therapists)	Primary care settings	Universal	Suicide risk trainings	NA (reviewed intervention characteristics)	1 Low
10 (Bahji et al., 2021b)	Comparative Efficacy and Acceptability of Psychotherapies for Self-harm and Suicidal Behavior Among Children and Adolescents: A Systematic Review and Network Meta-analysis	Meta-analysis	Children and adolescents	Mixed settings	Indicated	Psychotherapy and psychosocial interventions (including brief interventions, CBT, DBT, eclectic therapy, family-based therapy, IPT, MBCT, ST, and psychoanalytic psychotherapy)	SH	5 High
11 (Balaguru, Sharma, & Waheed, 2013)	Understanding the effectiveness of school-based interventions to prevent suicide: A realist review	Narrative synthesis	Adolescents (aged 13 to 16 years)	Education settings	Selective	Mixed intervention types	SA	1 Low
12 (Barker et al., 2014)	Management of suicidal and self-harming behaviors in prisons: systematic literature review of evidence-based activities	Narrative summary	People in prison	Prison	Selective	Mixed intervention types (including multifaceted suicide prevention programs, peer focused suicide prevention activities, gatekeeper trainings, and prison policies)	SH	3 Medium

	<b>Study citation</b>	<b>Title</b>	<b>Type of analysis</b>	<b>Population characteristics</b>	<b>Setting</b>	<b>Level of intervention</b>	<b>Intervention type</b>	<b>Suicide-related primary outcome(s)</b>	<b>Quality impression</b>
13	(Barker et al., 2017)	Rail-suicide prevention: Systematic literature review of evidence-based activities	Narrative synthesis	General community samples	Community settings	Universal	Means restriction (including platform screen doors, blue lights, and media reporting guidelines)	Suicide rates	3 Medium
14	(Bartoli et al., 2014)	Ketamine as a rapid-acting agent for suicidal ideation: A meta-analysis	Meta-analysis	Adults with current SI	Emergency departments	Indicated	Ketamine	SI	5 High
15	(Bartone et al., 2019)	Peer Support Services for Bereaved Survivors: A Systematic Review	Narrative summary	People bereaved by suicide (including parents, hospice nurses/practitioners, widows, mental health clinicians exposed to suicide, bereaved teenagers, and suicide survivors)	Mixed settings	Selective	Peer support interventions	Grief	3 Medium
16	(Belsher et al., 2019)	Prediction Models for Suicide Attempts and Deaths: A Systematic Review and Simulation	Narrative summary	General community and military populations samples	Digital settings	Selective	Risk assessment using prediction algorithms	Suicide mortality and SA prediction	5 High
17	(Bennett et al., 2015)	A Youth Suicide Prevention Plan for Canada: A Systematic Review of Reviews	Narrative synthesis	Children and adolescents (24 years and younger)	Mixed settings	Selective	Mixed intervention types (including education and awareness trainings, screening, means restriction, media guidelines, and psychiatric treatment)	Suicide rates	3 Medium
18	(Bergfeld et al., 2018)	Treatment-resistant depression and suicidality	Meta-analysis and meta-regression	People diagnosed with TRD	Mixed settings	Indicated	Mixed intervention types (including CBT, ECT, deep brain stimulation,	Suicide rates and SA	1 Low

Study citation	Title	Type of analysis	Population characteristics	Setting	Level of intervention	Intervention type	Suicide-related primary outcome(s)	Quality impression	
19	(Bernert et al., 2014)	A review of multidisciplinary clinical practice guidelines in suicide prevention: toward an emerging standard in suicide risk assessment and management, training, and practice	Narrative summary	Organisations and government departments	Mixed settings	Universal	Government and organisation guidelines and vagal nerve stimulation)	Assessed intervention characteristics (including evidence-base and outcome assessment)	1 Low
20	(Bernert et al., 2020)	Artificial Intelligence and Suicide Prevention: A Systematic Review of Machine Learning Investigations	Narrative summary	Mixed populations (including general adults, older adults, children, adolescents, people with diagnosed mental health conditions (including mood disorders and schizophrenia), military populations, people presenting to high-risk or triage settings)	Digital settings	Selective	Risk assessment using AI and ML	Suicide risk (defined as suicidal self-directed violence)	3 Medium
21	(Black et al., 2021)	Preventing suicide in post-secondary students: a scoping review of suicide prevention programs	Narrative synthesis	Tertiary students (aged 18 to 25 years)	Mixed settings	Selective	Mixed intervention types (including gatekeeper trainings, screening, and counselling)	Knowledge, self-efficacy, and willingness to intervene	2 Low to medium
22	(Bohanna & Wang, 2012)	Media guidelines for the responsible reporting of	Narrative summary	Organisations and government departments	Community settings	Universal	Media guidelines	Suicide rates	1 Low

<b>Study citation</b>	<b>Title</b>	<b>Type of analysis</b>	<b>Population characteristics</b>	<b>Setting</b>	<b>Level of intervention</b>	<b>Intervention type</b>	<b>Suicide-related primary outcome(s)</b>	<b>Quality impression</b>
	suicide: a review of effectiveness							
23 (Bolton et al., 2015)	Suicide risk assessment and intervention in people with mental illness	Narrative summary	Mixed populations (adults, children, adolescents, and people diagnosed with mental health conditions)	Mixed settings	Selective; Indicated	Mixed intervention types (including risk assessment instruments, pharmacotherapy, ECT, psychotherapies, and follow-up care methods)	Risk of suicide	1 Low
24 (Bornheimer et al., 2020)	Effectiveness of Suicide-Focused Psychosocial Interventions in Psychosis: A Systematic Review and Meta-Analysis	Meta-analysis	People with diagnosed mental health conditions	Clinical settings	Selective; Indicated	Psychotherapy interventions (including CBT and MI)	Suicidal self-injurious behavior (defined as suicide rates, SI, and SA)	3 Medium
25 (Bowden, McCoy, & Reavley, 2020)	Suicidality and suicide prevention in culturally and linguistically diverse (CALD) communities: A systematic review	Qualitative thematic analysis	Culturally and linguistically diverse (CALD) communities in the United States, Canada, and various European countries	Mixed settings	All	Mixed intervention types	Suicidality	1 Low
26 (Bowersox et al., 2021)	Peer-based interventions targeting suicide prevention: A scoping review	Narrative synthesis	Adults aged 18 and above	Mixed settings	Selective	Social and peer support interventions (including gatekeeper trainings, crisis support, and peer support groups)	SA and suicide rates	2 Low to medium
27 (Braun, Bschor, Franklin, & Baethge, 2016)	Suicides and Suicide Attempts during Long-Term Treatment with Antidepressants: A Meta-Analysis of 29 Placebo-Controlled Studies Including 6,934 Patients with	Meta-analysis	Adults with diagnosed with MDD	Clinical settings	Selective	Antidepressants	SA and suicide rates	5 High

	<b>Study citation</b>	<b>Title</b>	<b>Type of analysis</b>	<b>Population characteristics</b>	<b>Setting</b>	<b>Level of intervention</b>	<b>Intervention type</b>	<b>Suicide-related primary outcome(s)</b>	<b>Quality impression</b>
		Major Depressive Disorder							
28	(Brausch & Girresch, 2012)	A review of empirical treatment studies for adolescent non-suicidal self-injury	Narrative synthesis	Adolescents who engage in NSSI	Mixed settings	Indicated	Psychotherapy interventions (including CBT, DBT, and PST)	NSSI	1 Low
29	(Briggs et al., 2019)	The effectiveness of psychoanalytic/psychodynamic psychotherapy for reducing suicide attempts and self-harm: systematic review and meta-analysis	Meta-analysis	Adults, children, and adolescents	Clinical settings	Indicated	Psychoanalytic and psychodynamic therapies	Repetition of SH	3 Medium
30	(Burke et al., 2019)	The use of machine learning in the study of suicidal and non-suicidal self-injurious thoughts and behaviors: A systematic review	Narrative synthesis	Mixed populations (including adolescents, tertiary students, adults, veterans, and people with histories of NSSI and/or SI)	Digital settings	Selective	Risk assessment using machine learning	Suicide rates, SA, SI, NSSI and suicide risk	5 High
31	(Busby et al., 2020)	Evidence-Based Interventions for Youth Suicide Risk	Narrative summary	Children and adolescents (19 years and younger)	Mixed settings	Selective	Psychotherapy and psychosocial interventions (including CBT, DBT, and family-based therapy)	Suicidal behaviours	1 Low
32	(Buscher et al., 2020)	Internet-Based Cognitive Behavioral Therapy to Reduce Suicidal Ideation: A Systematic Review and Meta-analysis	Meta-analysis	Mixed populations	Digital settings	Indicated	iCBT	SI, SA, and suicide rates	3 Medium

	<b>Study citation</b>	<b>Title</b>	<b>Type of analysis</b>	<b>Population characteristics</b>	<b>Setting</b>	<b>Level of intervention</b>	<b>Intervention type</b>	<b>Suicide-related primary outcome(s)</b>	<b>Quality impression</b>
33	(Calati & Courtet, 2016)	Is psychotherapy effective for reducing suicide attempt and non-suicidal self-injury rates? Meta-analysis and meta-regression of literature data	Meta-analysis	Mixed populations (adolescents, adults, people diagnosed with mental health disorders (including BPD, MDD, schizophrenia-spectrum disorders), and people with a history of SA, NSSI, deliberate SH, imminent suicidal risk, or SI)	Clinical settings	Indicated	Psychotherapy interventions (including CBT, DBT, IPT, MBT, and psychoanalytic therapies)	SA and NSSI	3 Medium
34	(Calear et al., 2016b)	A systematic review of psychosocial suicide prevention interventions for youth	Narrative synthesis	Children, adolescents, and young adults (aged 12 to 25 years)	Mixed settings	Selective	Psychotherapy and psychosocial interventions (including CBT, DBT, MI, PST, psychoeducation, and social support)	Suicidal behaviours (defined as SA and SH)	1 Low
35	(Carter et al., 2017)	Predicting suicidal behaviours using clinical instruments: systematic review and meta-analysis of positive predictive values for risk scales	Meta-analysis	Mixed populations (including adolescents, adults, veterans, people in prison, people diagnosed with mental health conditions (including mood disorders, psychosis, schizophrenia, PTSD, and personality disorder), and people who have	Clinical settings	Selective	Risk assessment instruments	SH and suicide rates	5 High

Study citation	Title	Type of analysis	Population characteristics	Setting	Level of intervention	Intervention type	Suicide-related primary outcome(s)	Quality impression
			experienced recent SH or SI					
36 (Carter et al., 2019)	Assessment tools of immediate risk of self-harm and suicide in children and young people: A scoping review	Narrative summary	Children and adolescents (18 years and younger)	Clinical settings	Selective	Risk assessment instruments	Immediate risk of suicide or SH	5 High
37 (Castillo-Sanchez et al., 2020)	Suicide Risk Assessment Using Machine Learning and Social Networks: a Scoping Review	Narrative summary	General community samples (social media users)	Digital settings	Universal	Risk assessment using AI and ML	Suicide risk	1 Low
38 (Cervantes et al., 2021)	Universal Suicide Risk Screening for Youths in the Emergency Department: A Systematic Review	Narrative synthesis	Adolescents and youth (25 years and younger)	Emergency departments	Universal	Risk assessment and screening	Suicide risk	5 High
39 (Chan et al., 2016)	Predicting suicide following self-harm: Systematic review of risk factors and risk scales	Meta-analysis	People presenting with SH or suicidal behaviours	Clinical settings	Selective; Indicated	Risk assessment instruments	Suicide rates	5 High
40 (Chaudhary et al., 2020)	Suicide during Transition of Care: a Review of Targeted Interventions	Narrative summary	Children, adolescents, and adults discharged from hospital or emergency departments admitted after SH, SI, or SA	Clinical settings	Indicated	Interventions after discharge from the hospital (including telephone contacts, letters, green cards, postcards, structured visits, and community out-reach programs)	Suicidal behaviours	2 Low to medium
41 (Chauliac et al., 2020)	Suicide Prevention Interventions for Older People in Nursing Homes	Narrative synthesis	Older adults	Clinical settings	Selective	Gatekeeper trainings for nursing home staff and psychosocial interventions	SI	2 Low to medium

Study citation	Title	Type of analysis	Population characteristics	Setting	Level of intervention	Intervention type	Suicide-related primary outcome(s)	Quality impression
	and Long-Term Care Facilities: A Systematic Review							
42 (Chavez-Flores et al., 2019)	Assessment tools of non-suicidal self-injury in adolescents 1990-2016: a systematic review	Narrative synthesis	Adolescent (aged 10 to 19 years)	Education settings	Universal	Risk assessment instruments	NSSI	5 High
43 (Chen & Chan, 2020)	Effectiveness of Digital Health Interventions on Unintentional Injury, Violence, and Suicide: Meta-Analysis	Meta-analysis	Mixed populations (including general community samples, populations identified to be at risk, people presenting with depression, SI, SH, and/or suicidal behaviours, and victims of violence and abuse)	Digital settings	Selective	Psychotherapy and psychosocial interventions (including mostly CBT based approaches delivered using virtual reality, apps, videos and websites)	SI	2 Low to medium
44 (Chen, Cheng, Zhao, & Zhang, 2021a)	Effects of dialectical behaviour therapy on reducing self-harming behaviours and negative emotions in patients with borderline personality disorder: A meta-analysis	Meta-analysis	People diagnosed with BPD	Mixed settings	Selective; Indicated	DBT	SH	5 High
45 (Chen et al., 2021c)	Can seizure therapies and noninvasive brain	Narrative synthesis	Diagnosed mental health conditions (including	Clinical settings	Selective	Neuromodulation (including seizure	Suicidality (defined as suicide rates, SI, and SA)	5 High



Study citation	Title	Type of analysis	Population characteristics	Setting	Level of intervention	Intervention type	Suicide-related primary outcome(s)	Quality impression	
	stimulations prevent suicidality? A systematic review		affective disorders, PTSD, personality disorders, mixed mania, schizophrenia, and schizoaffective disorders)			therapies and noninvasive brain stimulation)			
46	(Chesin & Stanley, 2013)	Risk assessment and psychosocial interventions for suicidal patients	Narrative summary	Adolescents and adults	Mixed settings	All	Mixed intervention types (including risk assessment, means restrictions, safety planning interventions, psychotherapies (such as CBT, MBCT, and DBT), and brief psychosocial interventions)	Suicide rates and SH	1 Low
47	(Chesin et al., 2016)	Reviewing Mindfulness-Based Interventions for Suicidal Behavior	Narrative summary	Mixed populations (including general community samples, people living in residential therapeutic communities, adults who smoke 10+ a day, adult cancer patients, veterans, high school students, adults diagnosed with MDD, and adults with active suicidal intent)	Mixed settings	Indicated	Mindfulness based interventions (including MBCT, MBSR, non-standardised mindfulness course, and meditation practices)	SH	1 Low
48	(Christensen et al., 2014)	E-health interventions for suicide prevention	Narrative summary	Mixed populations (adolescents, tertiary students, people living with HIV, telephone	Digital settings	Selective; Indicated	Mixed intervention types (including online CBT modules, weekly phone calls/ texts, online risk	SH	1 Low

Study citation	Title	Type of analysis	Population characteristics	Setting	Level of intervention	Intervention type	Suicide-related primary outcome(s)	Quality impression	
			counselling callers, people diagnosed with depression, primary care patients, social media users, people experiencing SI, and people undergoing treatment post-SA)			assessment, and social media groups)			
49	(Cipriani et al., 2013)	Lithium in the prevention of suicide in mood disorders: updated systematic review and meta-analysis	Meta-analysis	People diagnosed with mood disorders	Clinical settings	Selective	Lithium	Suicide rates and SH	5 High
50	(Clifford, Doran, & Tsey, 2013)	A systematic review of suicide prevention interventions targeting indigenous peoples in Australia, United States, Canada and New Zealand	Narrative summary	Indigenous communities in Australia, United States, Canada and New Zealand	Mixed settings	Selective	Mixed intervention types (including community prevention initiatives, gatekeeper trainings, and education)	NA (described intervention characteristics)	3 Medium
51	(Corcoran, Dattalo, Crowley, Brown, & Grindle, 2011)	A systematic review of psychosocial interventions for suicidal adolescents	Meta-analysis	Children and adolescents (aged 10 to 18 years) presenting with suicidal thoughts or suicidal behavior	Clinical settings	Indicated	Psychotherapy and psychosocial interventions (including attention-based family therapy, home-based family interventions, multisystemic therapy, skill- and supportive relationship-based treatment, group	Suicidal events	1 Low

Study citation	Title	Type of analysis	Population characteristics	Setting	Level of intervention	Intervention type	Suicide-related primary outcome(s)	Quality impression
						therapies, CBT, DBT, education, rapid response outpatient models, youth nominated support teams, and specialised emergency room care)		
52 (Corke et al., 2020)	Meta-analysis of the strength of exploratory suicide prediction models; from clinicians to computers	Meta-analysis	People who have survived a SA and those who have died by suicide	Digital settings	Indicated	Risk assessment using machine learning, suicide prediction models, and clinical judgement	Suicide prediction	5 High
53 (Cox et al., 2012)	Suicide clusters in young people: evidence for the effectiveness of postvention strategies	Narrative synthesis	Children and adolescents	Mixed settings	Indicated	Postvention programs (including the development of a community response plan, educational/psychological debriefings, individual and group counseling for affected peers, screening of high-risk individuals, responsible media reporting of suicide clusters, and promotion of health recovery within the community to prevent further suicides)	NA (reviewed intervention characteristics)	1 Low
54 (Cox et al., 2013)	Interventions to reduce suicides at suicide hotspots: a systematic review	Narrative synthesis	Children and adolescents	Mixed settings	Universal	Means restriction (including installation of physical barriers, placement of signs and telephones, media reporting guidelines, and increasing the likelihood of intervention by a third party through surveillance and staff training)	Suicide rates	1 Low

	<b>Study citation</b>	<b>Title</b>	<b>Type of analysis</b>	<b>Population characteristics</b>	<b>Setting</b>	<b>Level of intervention</b>	<b>Intervention type</b>	<b>Suicide-related primary outcome(s)</b>	<b>Quality impression</b>
55	(Cox & Hetrick, 2017)	Psychosocial interventions for self-harm, suicidal ideation and suicide attempt in children and young people: What? How? Who? and Where?	Narrative synthesis	Children and adolescents (25 years and younger) who had experienced SH, SI, or SA	Mixed settings	Indicated	Psychotherapy and psychosocial interventions (CBT, PST, IPT, MI, distal support methods, and social support groups)	Suicide-related behaviours (defined as SA, SI and SH)	3 Medium
56	(Cuijpers et al., 2013)	The effects of psychotherapy for adult depression on suicidality and hopelessness: a systematic review and meta-analysis	Meta-analysis	Adults diagnosed with depression	Mixed settings	Selective; Indicated	Psychotherapy and psychosocial interventions (including CBT, MBCT, rational-emotive therapy, psychodynamic therapy, existential humanistic therapy, and life review)	Suicidality (defined as SI and suicidal risk)	1 Low
57	(Cusimano & Sameem, 2011)	The effectiveness of middle and high school-based suicide prevention programmes for adolescents: a systematic review	Narrative summary	Children and adolescents	Education settings	Universal	Mixed intervention types (including a video discussion lesson, three-phase intervention, participatory classes, curriculum vignette program, the SOS Suicide Prevention Program, and the SEHS Suicide Prevention Program)	Suicide rates	1 Low
58	(D'Anci et al., 2019)	Treatments for the prevention and management of suicide: A systematic review	Narrative synthesis	Mixed populations	Mixed settings	Selective	Mixed intervention types (including CBT, DBT, brief psychological interventions, crisis response planning, peer support, ketamine, lithium, and sublingual buprenorphine)	SA	3 Medium
59	(D'Hotman & Loh, 2020)	AI enabled suicide prediction tools: a	Qualitative analysis	General community samples	Digital settings	Universal	Risk assessment using AI, ML and prediction tools	Suicide risk	1 Low

Study citation	Title	Type of analysis	Population characteristics	Setting	Level of intervention	Intervention type	Suicide-related primary outcome(s)	Quality impression
	qualitative narrative review		(identified from medical records and website users)					
60 (Dabkowski & Porter, 2021)	An exploration into suicide prevention initiatives for mental health nurses: A systematic literature review	Qualitative analysis	Mental health nurses	Community settings	Selective	The Zero Suicide initiative	NA (described intervention characteristics)	1 Low
61 (Daigle, Pouliot, Chagnon, Greenfield, & Mishara, 2011)	Suicide attempts: prevention of repetition	Narrative synthesis	General adult samples	Mixed settings	Indicated	Mixed intervention types (including pharmacological treatments, CBT, psychodynamic therapy, mixed therapies, motivational interviewing, visit, postal, or telephone contact, green-token emergency card provisions, hospitalization, and outreach programs)	Repeated SA or suicides	1 Low
62 (Davidson & Tran, 2014)	Impact of treatment intensity on suicidal behavior and depression in borderline personality disorder: a critical review	Narrative synthesis	People diagnosed with BPD	Mixed settings	Selective	Psychotherapy interventions (including CBT, DBT, and MBT)	Suicidal acts	1 Low
63 (de Aguiar et al., 2021)	The impact of mindfulness on suicidal behavior: a systematic review	Narrative synthesis	Mixed populations	Mixed settings	Selective; Indicated	Mindfulness based interventions (including MBCT, MBSR, daily mindfulness meditation practices, and mind body awareness training)	SI	3 Medium

	<b>Study citation</b>	<b>Title</b>	<b>Type of analysis</b>	<b>Population characteristics</b>	<b>Setting</b>	<b>Level of intervention</b>	<b>Intervention type</b>	<b>Suicide-related primary outcome(s)</b>	<b>Quality impression</b>
64	(DeCou et al., 2019)	Dialectical Behavior Therapy Is Effective for the Treatment of Suicidal Behavior: A Meta-Analysis	Meta-analysis	Mixed populations (including adolescents and adults diagnosed with mental health conditions (including BPD and BP), veterans, mental health in- and out-patients)	Clinical settings	Selective; Indicated	DBT	Self-directed violence	3 Medium
65	(Del Matto et al., 2020)	Lithium and suicide prevention in mood disorders and in the general population: A systematic review	Narrative synthesis	General community samples and people with diagnosed mood disorders	Clinical settings	Universal; Selective	Lithium	Suicide risk	3 Medium
66	(Devenish et al., 2016)	The treatment of suicidality in adolescents by psychosocial interventions for depression: A systematic literature review	Narrative summary	Adolescents (aged 11 to 19 years) with depression	Mixed settings	Universal; Selective	Mixed intervention types (including pharmacotherapy, ABFT, CBT, IPT, MI, and social support programs)	Suicidality	1 Low
67	(Dong et al., 2015)	Suicide in the global Chinese aging population: a review of risk and protective factors, consequences, and interventions	Narrative summary	Older adults (aged 60 years and older)	Clinical settings	Selective	Mixed intervention types (including modified ECT, tele-check or home visits, and a multifaceted intervention incorporating gatekeeper training, aftercare for suicide attempters, treatment for depression, and case management)	Suicide rates and SA	1 Low
68	(Donker et al., 2013)	Suicide prevention in schizophrenia spectrum disorders and psychosis: a systematic review	Narrative synthesis	People diagnosed with schizophrenia spectrum	Mixed settings	Selective	Psychotherapy and psychosocial interventions (including psychoeducation, CBT, and case management)	SI	1 Low

Study citation	Title	Type of analysis	Population characteristics	Setting	Level of intervention	Intervention type	Suicide-related primary outcome(s)	Quality impression	
69	(Doupnik et al., 2020)	Association of Suicide Prevention Interventions With Subsequent Suicide Attempts, Linkage to Follow-up Care, and Depression Symptoms for Acute Care Settings: A Systematic Review and Meta-analysis	Meta-analysis	Adolescents and adults presenting with suicide risk or a recent SA	Acute care settings	Indicated	Brief contact interventions, care coordination, safety planning interventions, and other brief therapies	SA	3 Medium
70	(Dueweke & Bridges, 2018)	Suicide interventions in primary care: A selective review of the evidence	Qualitative analysis	General community samples	Primary care settings	Selective	Educating GPs, screening for suicide risk, and assessing and managing depression and suicide risk	Suicide risk	1 Low
71	(Ekanem & Woods, 2021)	Effectiveness of Non-suicidal Self-Injury Interventions among Incarcerated Women in Correctional Facilities and Secure Settings: An Integrative Review	Narrative synthesis	Women in prison	Prison	Indicated	Mixed intervention types (including CBT, DBT, IPT, staff training, and support programs)	NSSI	3 Medium
72	(Erford et al., 2018)	Selecting suicide ideation assessment instruments: A meta-analytic review	Meta-analysis	Children, adolescents, and adults	Clinical settings	Universal	Risk assessment instruments	SI	3 Medium

	<b>Study citation</b>	<b>Title</b>	<b>Type of analysis</b>	<b>Population characteristics</b>	<b>Setting</b>	<b>Level of intervention</b>	<b>Intervention type</b>	<b>Suicide-related primary outcome(s)</b>	<b>Quality impression</b>
73	(Exner-Cortens et al., 2021)	School-based suicide risk assessment using ehealth for youth: Systematic scoping review	Narrative synthesis	Children and adolescents	Education settings	Universal	Electronic risk assessment	SI	1 Low
74	(Feldman et al., 2021)	Economic Evaluations of Public Health Interventions to Improve Mental Health and Prevent Suicidal Thoughts and Behaviours: A Systematic Literature Review	Narrative synthesis	Mixed populations (including children, adolescents, adults, older adults, general community samples, patients in maternity care centers, workplace employees, and people bereaved by suicide)	Mixed settings	Universal; Indicated	Mixed intervention types (including iCBT, postvention programs, and universal interventions)	Cost-effectiveness	4 Medium to high
75	(Ferguson et al., 2018)	The effectiveness of suicide prevention education programs for nurses: A systematic review	Narrative summary	Registered nurses	Mixed settings	Universal	Gatekeeper trainings	Knowledge, attitudes, competence, and confidence	3 Medium
76	(Ferguson et al., 2020)	The impact of suicide prevention education programmes for nursing students: A systematic review	Narrative summary	Nursing students	Mixed settings	Universal	Gatekeeper trainings	Attitudes, knowledge, self-confidence, self-efficacy, skills/ability, and behavioural intentions	1 Low
77	(Ferguson et al., 2021)	The Effectiveness of the Safety Planning Intervention for Adults Experiencing Suicide-Related	Narrative synthesis	Mixed populations (including general community samples, tertiary students, veterans and their significant others,	Mixed settings	Indicated	Mixed intervention types (including safety planning, MBCT, psychotherapies, and follow-up support using letters, telephone calls, or face-to-face visits)	Suicidality (defined as SA, SH, and SI)	5 High



Study citation	Title	Type of analysis	Population characteristics	Setting	Level of intervention	Intervention type	Suicide-related primary outcome(s)	Quality impression
	Distress: A Systematic Review		healthcare professionals, and refugees)					
78 (Finlayson-Short et al., 2020)	Community Based Support for People at Risk for Suicide and Those Who Care for them - Areas for Improvement	Narrative summary	Mixed populations (including people bereaved by suicide (including parents and adolescents), family caregivers of and people with a SA in the past month)	Community settings	Selective	Peer support interventions	Suicide-related behaviours	4 Medium to high
79 (Flaherty, 2018)	Treating adolescent nonsuicidal self-injury: A review of psychosocial interventions to guide clinical practice	Narrative summary	Adolescents aged 12 to 18 years (not diagnosed with BPD)	Clinical settings	Indicated	Psychotherapy and psychosocial interventions (including DBT, MBT, developmental group interventions, therapeutic assessments, and brief interventions)	NSSI	2 Low to medium
80 (Fonseka et al., 2019)	The utility of artificial intelligence in suicide risk prediction and the management of suicidal behaviors	Narrative summary	General community samples (identified from medical records and website users)	Digital settings	Universal	Risk assessment using AI and ML	Suicide rates	1 Low
81 (Forte et al., 2021)	The Role of New Technologies to Prevent Suicide in Adolescence: A Systematic Review of the Literature	Narrative synthesis	Adolescents	Digital settings	Universal; Selective	Technological tools including telemedicine, mobile health interventions, and language detection	Suicidal behaviours (defined as SI and SA)	3 Medium
82 (Fountoulakis, Gonda, & Rihmer, 2011)	Suicide prevention programs through community intervention	Narrative summary	Mixed populations (including general community samples,	Community settings	Universal	Mixed intervention types (including risk assessment, screening, education and awareness,	Suicide rates	1 Low

Study citation	Title	Type of analysis	Population characteristics	Setting	Level of intervention	Intervention type	Suicide-related primary outcome(s)	Quality impression	
			adolescents, and older adults)			gatekeeper trainings, multilevel approaches, training healthcare professionals, life skill development programs, psychoeducation, training of trauma response and critical incident stress management teams, community initiatives, epidemiological databases, military based initiatives, and limited patient psychotherapist privilege)			
83	(Fox et al., 2020)	Interventions for suicide and self-injury: A meta-analysis of randomized controlled trials across nearly 50 years of research	Meta-analysis	Mixed populations (including children, adolescents, adults, and older adults)	Mixed settings	Indicated	Mixed intervention types (include social outreach, large-scale crisis interventions, multilevel approaches, psychodynamic therapies, CBT, prefrontal lobotomy, acute psychiatric hospitalisation, pharmacotherapy, gatekeeper training, peer support, and neuromodulation)	Suicide rates and SH	5 High
84	(Frey & Hunt, 2018)	Treatment For Suicidal Thoughts and Behavior: A Review of Family-Based Interventions	Narrative summary	Adolescents aged between 11 and 17 years	Clinical settings	Indicated	Psychotherapy and psychosocial interventions (family-based approaches, CBT, DBT, emergency department interventions, home based interventions, youth nominated support teams, psychoeducation, and multi-systemic therapy)	Suicidal behaviours and SA	3 Medium

	<b>Study citation</b>	<b>Title</b>	<b>Type of analysis</b>	<b>Population characteristics</b>	<b>Setting</b>	<b>Level of intervention</b>	<b>Intervention type</b>	<b>Suicide-related primary outcome(s)</b>	<b>Quality impression</b>
85	(Frey et al., 2022)	Review of family-based treatments from 2010 to 2019 for suicidal ideation and behavior	Narrative synthesis	Adolescents (aged 10 to 19 years) with severe depressive symptoms, history of SI or behaviours, co-occurring substance use, or co-occurring features of BPD	Mixed settings	Indicated	Family based interventions (including CBT, brief emergency department crisis interventions, ABFT, family therapy, and psychoeducation)	Suicidal behaviours and SI	4 Medium to high
86	(Gijzen et al., 2022)	Effectiveness of school-based preventive programs in suicidal thoughts and behaviors: A meta-analysis	Meta-analysis	Children and adolescents (aged up to 25 years)	Education settings	Universal	Mixed intervention types (including IPT, Signs of Suicide program, Sources of Strength program, mindfulness, Head Strong, distress prevention programs, and screening)	Suicidal behaviours and SI	5 High
87	(Glenn et al., 2019)	Evidence Base Update of Psychosocial Treatments for Self-Injurious Thoughts and Behaviors in Youth	Narrative synthesis	Children and adolescents (aged under 19 years)	Mixed settings	Indicated	Psychotherapy and psychosocial interventions (DBT, CBT, family therapies, IPT, MI, multiple systems therapy, parent training, support-based therapy, group therapies, resource interventions (postcards), and brief skills trainings)	Self-injurious behaviours	3 Medium
88	(Gonzales & Bergstrom, 2013)	Adolescent non-suicidal self-injury (NSSI) interventions	Narrative summary	Adolescents	Mixed settings	Indicated	Mixed intervention types (including CBT, DBT, developmental group therapy, psychosocial assessment, and brief psychotherapy)	Suicide rates	1 Low
89	(Gotzsche & Gotzsche, 2017)	Cognitive behavioural therapy halves the	Meta-analysis	Children, adolescents, and adults who had	Mixed settings	Indicated	CBT	SA	3 Medium

Study citation	Title	Type of analysis	Population characteristics	Setting	Level of intervention	Intervention type	Suicide-related primary outcome(s)	Quality impression	
	risk of repeated suicide attempts: systematic review		engaged in any type of SA resulting in presentation to clinical services						
90	(Gould et al., 2018)	Suicide Screening Tools for use in Incarcerated Offenders: A Systematic Review	Narrative synthesis	People going through intake at a prison	Prison	Selective	Risk assessment instruments	Suicide risk	3 Medium
91	(Griffiths, Dawber, McDougall, Midgley, & Baker, 2022)	Non-restrictive interventions to reduce self-harm amongst children in mental health inpatient settings: Systematic review and narrative synthesis	Narrative synthesis	In-patient children and adolescents	Clinical settings	Indicated	Mixed intervention types (including DBT, family therapy, skills groups, staff training, creating safe boxes, and changes to ward environments)	SH	4 Medium to high
92	(Grigoroglou et al., 2021)	Effectiveness of collaborative care in reducing suicidal ideation: An individual participant data meta-analysis	Meta-analysis	Adults diagnosed with depression (aged above 17 years)	Primary care settings	Selective	Collaborative care initiatives	SI	5 High
93	(Gunnell et al., 2017)	Prevention of suicide with regulations aimed at restricting access to highly hazardous pesticides: a systematic review of the international evidence	Narrative synthesis	General community samples in low-, middle-, and high-income countries	Mixed settings	Universal	Restricting access to pesticides	Suicide rates	5 High

	<b>Study citation</b>	<b>Title</b>	<b>Type of analysis</b>	<b>Population characteristics</b>	<b>Setting</b>	<b>Level of intervention</b>	<b>Intervention type</b>	<b>Suicide-related primary outcome(s)</b>	<b>Quality impression</b>
94	(Gunnell et al., 2020)	Suicide risk and prevention during the COVID-19 pandemic	Narrative summary	General community samples	Mixed settings	Universal	Means restriction, media guidelines, and enhanced surveillance	Suicide rates	3 Medium
95	(Hamilton & Klimes-Dougan, 2015)	Gender differences in suicide prevention responses: implications for adolescents based on an illustrative review of the literature	Narrative synthesis	Adolescents	Mixed settings	All	School-, community-, and health-based prevention programs	Suicidal behaviours	1 Low
96	(Hanratty et al., 2019)	A systematic review of efficacy of Collaborative Assessment and Management of Suicidality (CAMS) in managing suicide risk and deliberate self-harm in adult populations	Narrative synthesis	Adult in- and out-patients	Clinical settings	Indicated	Collaborative assessment and management of suicidality	Suicide rates and SH	5 High
97	(Harlow et al., 2014)	A systematic review of evaluated suicide prevention programs targeting indigenous youth	Narrative synthesis	Indigenous youth	Mixed settings	All	Multi-component prevention strategies	Suicide rates and SH	5 High
98	(Harmon et al., 2016)	A review of the effectiveness of military suicide prevention programs in reducing rates of military suicides	Narrative summary	Military samples (including army, air force, and navy)	Mixed settings	Selective; Indicated	Mixed intervention types (staff trainings, specialised suicide prevention programs, and follow-up letters after hospitalisation)	Suicide rates	1 Low

	<b>Study citation</b>	<b>Title</b>	<b>Type of analysis</b>	<b>Population characteristics</b>	<b>Setting</b>	<b>Level of intervention</b>	<b>Intervention type</b>	<b>Suicide-related primary outcome(s)</b>	<b>Quality impression</b>
99	(Haroz et al., 2020)	Evidence for suicide prevention strategies with populations in displacement: a systematic review	Narrative summary	Populations in displacement (including refugees, migrants, resettled refugee and asylum seekers)	Community settings	Universal; Selective; Indicated	Mixed intervention types (including risk assessment, staff training, gatekeeper training, awareness training, and brief interventions)	Suicide rates, SA, and SI	3 Medium
100	(Harris et al., 2019)	Predicting future self-harm or suicide in adolescents: a systematic review of risk assessment scales/tools	Narrative synthesis	Adolescents (aged 10 to 25 years)	Clinical settings	Indicated	Risk assessment instruments	Suicide rates, SA, and SH	4 Medium to high
101	(Harrod et al., 2014)	Interventions for primary prevention of suicide in university and other post-secondary educational settings	Meta-analysis	Tertiary students	Education settings	Universal	Mixed intervention types (including empathetic listening, means restriction, substance abuse prevention initiatives, and gatekeeper trainings)	Suicide rates and SA	3 Medium
102	(Hatcher et al., 2017)	Preventing suicide in indigenous communities	Narrative summary	Indigenous communities	Mixed settings	All	Prevention initiatives focused on enhancing sense of belonging and cultural identity	Suicidal behaviours	3 Medium
103	(Havarneanu et al., 2015)	A systematic review of the literature on safety measures to prevent railway suicides and trespassing accidents	Qualitative content analysis	General community samples	Community settings	Universal	Means restrictions (including physical barriers, environmental designs, monitoring and detection systems, traffic management, additional technologies for train drivers, responsible media reporting, and emergency information and outreach support at suicide hotspots)	Suicide rates	3 Medium

<b>Study citation</b>	<b>Title</b>	<b>Type of analysis</b>	<b>Population characteristics</b>	<b>Setting</b>	<b>Level of intervention</b>	<b>Intervention type</b>	<b>Suicide-related primary outcome(s)</b>	<b>Quality impression</b>
104 (Haw et al., 2015)	Economic recession and suicidal behaviour: Possible mechanisms and ameliorating factors	Narrative summary	General community samples	Community settings	Universal	Interventions and policies addressing factors to minimise effects on economic crises on suicide	Suicide rates	2 Low to medium
105 (Hawkins et al., 2021b)	Effects of somatic treatments on suicidal ideation and completed suicides	Narrative summary	People with diagnosed mental health conditions	Clinical settings	Indicated	Pharmacological interventions (including somatic treatments, SSRIs, lithium, clozapine, ketamine, and esketamine)	Suicide rates and SI	3 Medium
106 (Hawton et al., 2016b)	Psychosocial interventions following self-harm in adults: a systematic review and meta-analysis	Meta-analysis	Adults after a recent episode of SH	Mixed settings	Indicated	Psychotherapy and psychosocial interventions (including CBT, DBT, case management, and follow-up postcards)	Repetition of SH	3 Medium
107 (Hawton et al., 2016a)	Psychosocial interventions for self-harm in adults	Meta-analysis	Mixed populations (including general adults, and those diagnosed with mental health conditions (including personality disorders, PTSD, and alcohol misuse))	Mixed settings	Indicated	Psychotherapy and psychosocial interventions (including CBT, DBT, MBT, emotion regulation group-based psychotherapies, case management, and remote contact interventions)	SH	3 Medium
108 (Hawton et al., 2020)	Clustering of suicides in children and adolescents	Narrative synthesis	Children, adolescents, and young adults (aged 10 to 24 years)	Community settings	All	Mixed intervention types (including surveillance, information sharing, social media, bereavement support, monitoring and review planning, and evaluation of response)	Suicide rates	3 Medium

	<b>Study citation</b>	<b>Title</b>	<b>Type of analysis</b>	<b>Population characteristics</b>	<b>Setting</b>	<b>Level of intervention</b>	<b>Intervention type</b>	<b>Suicide-related primary outcome(s)</b>	<b>Quality impression</b>
109	(Herron et al., 2016)	Evidence-based gatekeeper suicide prevention in a small community context	Narrative summary	People living in small non-urban communities	Rural settings	Universal	Gatekeeper trainings	Confidence, willingness, self-perceived readiness to intervene, and intervention skills	1 Low
110	(Hetrick, McKenzie, Cox, Simmons, & Merry, 2012)	Newer generation antidepressants for depressive disorders in children and adolescents	Meta-analysis	Children and adolescents (aged 6 to 18 years old) diagnosed with depressive disorders	Clinical settings	Selective	Newer generation antidepressants	Suicidal behaviours and SI	5 High
111	(Hetrick et al., 2021)	New generations antidepressants for depression in children and adolescents: a network meta-analysis (Review)	Meta-analysis	Children and adolescents (aged 6 to 18 years olds) diagnosed with MDD	Clinical	Selective	Antidepressants	Suicide related outcomes	5 High
112	(Hetrick et al., 2016)	Effective psychological and psychosocial approaches to reduce repetition of self-harm: a systematic review, meta-analysis and meta-regression	Meta-analysis	Children and adolescents (aged 6 to 18 years olds) diagnosed with MDD	Clinical	Selective	Antidepressants	Suicide related outcomes	5 High
113	(Hill et al., 2021)	Saving Lives: A Systematic Review on the Efficacy of Theory-Informed Suicide Prevention Programs	Meta-analysis and meta-regression	Adults aged 18 years and above	Clinical settings	Indicated	Psychotherapy and psychosocial interventions (including ACT, CBT, PST, case management, IPT, solution-focused brief therapy, SH, and crisis response plans, and follow-up contact)	Repetition of SH	3 Medium
114	(Hobson et al., 2019)	Mobile Health for First Nations	Narrative summary	Mixed populations	Mixed settings	Universal	Gatekeeper training	Awareness, knowledge, and stigma	3 Medium



Study citation	Title	Type of analysis	Population characteristics	Setting	Level of intervention	Intervention type	Suicide-related primary outcome(s)	Quality impression
	Populations: Systematic Review							
115 (Hochschild et al., 2021)	The rapid anti-suicidal ideation effect of ketamine: A systematic review	Systematic Review	Mainly adult populations with depression	Clinical	Indicated	Ketamine	Suicidal Ideation	3 Medium
116 (Hofstra et al., 2020)	Effectiveness of suicide prevention interventions: A systematic review and meta-analysis	Narrative synthesis	Patients presenting with SI, depressive symptoms, diagnosed MDD, or BP	Clinical settings	Selective; Indicated	Ketamine	SI	5 High
117 (Holm et al., 2021)	Suicide prevention strategies for older persons-An integrative review of empirical and theoretical papers	Meta-analysis	Mixed populations	Mixed settings	All	Mixed intervention types (including community approaches, psychotherapeutic interventions, pharmacotherapy interventions, and multilevel interventions)	SA	5 High
118 (Holmes et al., 2021)	The Long-Term Efficacy of Suicide Prevention Gatekeeper Training: A Systematic Review	Qualitative thematic analysis	Older adults (aged 65 years or over)	Mixed settings	All	Mixed intervention types (including gatekeeper trainings, telephone counselling, social support groups, and community-based awareness programs)	NA	1 Low
119 (Hou et al., 2021)	Methods and efficacy of social support interventions in preventing suicide: a systematic review and meta-analysis	Narrative synthesis	General community samples	Mixed settings	Universal	Gatekeeper trainings	Attitudes, behaviours, behavioural intentions, knowledge, and self-efficacy	3 Medium
120 (Howe et al., 2020)	Suicidality Among Children and	Meta-analysis	Mixed populations (including youth,	Mixed settings	Selective; Indicated	Social support interventions	Suicide rates and SA	4 Medium to high

Study citation	Title	Type of analysis	Population characteristics	Setting	Level of intervention	Intervention type	Suicide-related primary outcome(s)	Quality impression	
	Youth With and Without Autism Spectrum Disorder: A Systematic Review of Existing Risk Assessment Tools		veterans, general adults, older adults, transgender women, and families of eating disorder patients)						
121	(Hunter et al., 2021)	The practice of lethal means restriction counseling in US emergency departments to reduce suicide risk: a systematic review of the literature	Qualitative thematic analysis	Youth (under the age of 21 years) with or without autism spectrum disorder	Clinical settings	Selective	Risk assessment instruments	Risk for suicidality and prevalence of suicidality	3 Medium
122	(Hurzeler et al., 2021)	Psychosocial Interventions for Reducing Suicidal Behaviour and Alcohol Consumption in Patients With Alcohol Problems: A Systematic Review of Randomized Controlled Trials	Narrative summary	Mixed populations (including suicidal youth, parent/caregiver(s) of a suicidal youth, and adult suicidal patients and their families)	Mixed settings	Selective	Means restriction counselling	Suicide rates	3 Medium
123	(Hvidt et al., 2016)	The impact of telephone crisis services on suicidal users: A systematic review of the past 45 years	Narrative synthesis	Adults diagnosed with alcohol related disorders	Clinical settings	Selective	Psychotherapy and psychosocial interventions (including CBT, DBT and dynamic deconstructivist psychotherapy)	Suicidal behaviours (defined as SH and SI)	3 Medium
124	(Inagaki et al., 2015)	Interventions to prevent repeat suicidal behavior in patients	Narrative summary	People with suicidal behaviours, SI, and/or SH	Community settings	Indicated	Telehealth interventions	Suicidal urgency	1 Low

Study citation	Title	Type of analysis	Population characteristics	Setting	Level of intervention	Intervention type	Suicide-related primary outcome(s)	Quality impression
	admitted to an emergency department for a suicide attempt: a meta-analysis							
125 (Inagaki, Kawashima, Yonemoto, & Yamada, 2019)	Active contact and follow-up interventions to prevent repeat suicide attempts during high-risk periods among patients admitted to emergency departments for suicidal behavior: a systematic review and meta-analysis	Meta-analysis	Patients admitted to emergency departments for suicidal behaviours	Emergency departments	Indicated	Mixed intervention types (including case management, psychotherapy, pharmacotherapy, and active contact and follow-up)	Repetition of SA and SH	3 Medium
126 (Ishimo et al., 2021)	Universal interventions for suicide prevention in high-income Organisation for Economic Co-operation and Development (OECD) member countries: a systematic review	Meta-analysis	Patients admitted to emergency departments for suicidal behaviours	Emergency departments	Indicated	Active contact and follow-up interventions	Repetition of SA and SH	3 Medium
127 (Itzhaky et al., 2021)	Twenty-six years of psychosocial interventions to reduce suicide risk in adolescents: Systematic review and meta-analysis	Narrative description	Mixed populations (including general community samples, older adults, people diagnosed with depression, young adults (aged 18 to 34 years), and	Mixed settings	All	Interventions to increase access to mental health services (workforce investment, raising affordability of mental health support, increase in monitoring for suicidality, employee gatekeeper training, and	NA (provided recommendations for governments, policy makers, and service providers)	3 Medium

Study citation	Title	Type of analysis	Population characteristics	Setting	Level of intervention	Intervention type	Suicide-related primary outcome(s)	Quality impression
			people in quarantine)			increasing digital access to mental health services) and national suicide policies and plans		
128 (Ivbijaro et al., 2019)	Preventing suicide, promoting resilience: Is this achievable from a global perspective?	Meta-analysis	Adolescents (aged 10 to 18 years)	Mixed settings	Indicated	Psychotherapy and psychosocial interventions (including ABFT, CBT, iCBT, IPT, DBT, MI, MBT, Signs of Suicide program, family therapies, group therapies, youth nominated support teams, mindfulness, and therapeutic assessments)	SI and SH	5 High
129 (Ivbijaro et al., 2021)	Suicide prevention and COVID-19	Narrative synthesis	Mixed populations (aged 13 years and above)	Mixed settings	Universal	Mixed intervention types	Suicide rates	1 Low
130 (Iyengar et al., 2018)	A further look at therapeutic interventions for suicide attempts and self-harm in adolescents: An updated systematic review of randomized controlled trials	Narrative summary	Mixed populations (including general community samples and people diagnosed with depression)	Mixed settings	All	Interventions to increase access to mental health services (workforce investment, raising affordability of mental health support, increase in monitoring for suicidality, employee gatekeeper training, and increasing digital access to mental health services) and national suicide policies and plans	Suicide rates	3 Medium
131 (Jin et al., 2016)	Recent Advances in Means Safety as a Suicide Prevention Strategy	Narrative synthesis	Children and adolescents (aged under 18 years) who have recently engaged in either SH or SA	Mixed settings	Indicated	Psychotherapy interventions (including CBT, DBT, and MBT)	SA and SH	3 Medium

	<b>Study citation</b>	<b>Title</b>	<b>Type of analysis</b>	<b>Population characteristics</b>	<b>Setting</b>	<b>Level of intervention</b>	<b>Intervention type</b>	<b>Suicide-related primary outcome(s)</b>	<b>Quality impression</b>
132	(Joe et al., 2018)	What works for adolescent Black males at risk of suicide: A review	Narrative summary	General community samples	Mixed settings	Universal	Means restrictions (including safe storage of firearms, installing breakaway closet bars, restrictions of medication pack sizes, safety barriers, and limiting access to gas and alcohol)	Suicide rates	1 Low
133	(Journot-Reverbel et al., 2017)	Support groups for children and adolescents bereaved by suicide: Lots of interventions, little evidence	Narrative summary	Young African American male youth (aged 24 years and younger)	Mixed settings	Indicated	Mixed intervention types (including ABFT, SSRIs, multisystemic therapy, good game behaviours, and the HeadStrong program)	SA	1 Low
134	(Katsivarda et al., 2021)	Communication-based suicide prevention after the first attempt. A systematic review	Narrative summary	Children and adolescents (aged under 18) bereaved by suicide	Mixed settings	Selective	Group therapies	Depression	1 Low
135	(Katz et al., 2013)	A systematic review of school-based suicide prevention programs	Narrative summary	Patients with a history of at least one SA	Mixed settings	Indicated	Active contact and follow-up interventions	Suicidal behaviours	1 Low
136	(Kawashima et al., 2019)	Interventions to prevent suicidal behavior and ideation for patients with cancer: A systematic review	Narrative synthesis	Young people (aged 18 years and under)	Education settings	Universal; Selective	Mixed intervention types (including awareness and education, screening, gatekeeper trainings, peer leadership, and skills training)	Suicide rates	1 Low
137	(Kessler et al., 2020)	Suicide prediction models: a critical review of recent research with recommendations	Narrative synthesis	People diagnosed with cancer	Mixed settings	Selective	Mixed intervention types (including psychotherapy, pharmacotherapy, integrated collaborative care, muscle relaxation,	Suicide rates, SA, and SI	3 Medium

Study citation	Title	Type of analysis	Population characteristics	Setting	Level of intervention	Intervention type	Suicide-related primary outcome(s)	Quality impression
	for the way forward					and therapeutic walking groups)		
138 (Kia et al., 2021)	Peer support as a protective factor against suicide in trans populations: A scoping review	Narrative summary	High risk individuals	Clinical settings	Selective; Indicated	Risk assessment using prediction models	Suicide rates	1 Low
139 (Kiley et al., 2020)	Constant observation of pediatric patients at risk for self-harm and suicide: An evidence-based practice inquiry	Narrative synthesis	Transgender populations including children, adolescents, college students, adults, and veterans	Mixed settings	Selective; Indicated	Peer support interventions	Suicidal behaviours	5 High
140 (Kim, 2018)	The Impacts of Social Protection Policies and Programs on Suicide: A Literature Review	Narrative summary	General community samples	Community settings	Universal	Social protection policies and programs	Suicides rates	2 Low to medium
141 (Klimes-Dougan, Klingbeil, & Meller, 2013)	The impact of universal suicide-prevention programs on the help-seeking attitudes and behaviors of youths	Narrative synthesis	Adolescents (aged 13 to 18 years)	Mixed settings	Universal	Mixed intervention types (including psychoeducational programs, first-generation programs, second-generation programs, multi-method effects, gatekeeper trainings, and public service education and awareness)	Help-seeking attitudes	1 Low
142 (KoKoAung & Aromataris, 2012)	The association between suicidality and treatment with selective serotonin reuptake inhibitors in older people with major	Meta-analysis	Older adults (aged 60 years and over) diagnosed with MDD	Clinical settings	Selective	Antidepressants	Suicide rates, SA, and SI	5 High

Study citation	Title	Type of analysis	Population characteristics	Setting	Level of intervention	Intervention type	Suicide-related primary outcome(s)	Quality impression
	depression: a systematic review							
143 (Kolves et al., 2020)	Impact of Alcohol Policies on Suicidal Behavior: A Systematic Literature Review	Narrative summary	General community samples	Mixed settings	Universal	Policies restricting alcohol availability	Suicidal mortality	3 Medium
144 (Kothgassner et al., 2020)	Does treatment method matter? A meta-analysis of the past 20 years of research on therapeutic interventions for self-harm and suicidal ideation in adolescents	Meta-analysis	Adolescents (aged 12 to 19 years) engaged in SH	Mixed settings	Indicated	Psychotherapy interventions (including CBT, DBT, MBT, group therapy, integrative therapy, therapeutic assessment, and cognitive analytic therapy)	SH and SI	5 High
145 (Kothgassner et al., 2021)	Efficacy of dialectical behavior therapy for adolescent self-harm and suicidal ideation: a systematic review and meta-analysis	Meta-analysis	Adolescents (aged 12 to 19 years)	Mixed settings	Indicated	DBT	SH	3 Medium
146 (Kral, 2016)	Suicide and Suicide Prevention among Inuit in Canada	Narrative summary	Inuit people in Canada	Mixed settings	Selective	Indigenous suicide prevention activities and programs and cultural activities	Suicide rates	5 High
147 (Kreuze et al., 2017)	Technology-enhanced suicide prevention interventions: A systematic review	Narrative synthesis	Mixed populations (including general community samples, children and adolescents, people living in regions with high suicide rates by burning, veterans,	Mixed settings	All	Digital interventions focused on increasing coping skills and decreasing risk factors using text messaging, telephones, websites, CDs and videos	Suicidal behaviours	1 Low

Study citation	Title	Type of analysis	Population characteristics	Setting	Level of intervention	Intervention type	Suicide-related primary outcome(s)	Quality impression
			and people with suicidal thoughts/ distress)					
148 (Kreuze & Lamis, 2018)	A Review of Psychometrically Tested Instruments Assessing Suicide Risk in Adults	Narrative synthesis	Adults (aged 18 years and over)	Clinical settings	Universal	Risk assessment instruments	Psychometric properties of the instruments	1 Low
149 (Kritzer et al., 2021)	Ketamine for treatment of mood disorders and suicidality: A narrative review of recent progress	Narrative summary	Adults with diagnosed mood disorders (including MDD, TRD, BP, anxiety, and PTSD)	Clinical settings	Selective	Ketamine	Suicide rates	3 Medium
150 (Krysinska et al., 2017)	Differences in the Effectiveness of Psychosocial Interventions for Suicidal Ideation and Behaviour in Women and Men: A Systematic Review of Randomised Controlled Trials	Narrative summary	Mixed populations (including school students, in-patients, and people diagnosed with BPD)	Mixed settings	All	Mixed intervention types (including Signs of Suicide program, youth nominated support teams, case management, CBT, DBT, brief counselling, psychoeducation, GP-based interventions, follow-up contact, multisystemic therapy, emotion regulation group therapies, and outreach programs)	Suicidal behaviours	1 Low
151 (Krysinska et al., 2021)	Effectiveness of Psychosocial Interventions for Family Members and Other Informal Support Persons of Individuals Who Have Made a Suicide Attempt	Narrative synthesis	Family members and other informal support persons of individuals of any age who had made a SA	Mixed settings	Selective	Psychotherapy and psychosocial interventions (including education, CBT, and family therapy)	Suicidal behaviours	3 Medium



	<b>Study citation</b>	<b>Title</b>	<b>Type of analysis</b>	<b>Population characteristics</b>	<b>Setting</b>	<b>Level of intervention</b>	<b>Intervention type</b>	<b>Suicide-related primary outcome(s)</b>	<b>Quality impression</b>
152	(Kucuker et al., 2021)	A Systematic Review of Neuromodulation Treatment Effects on Suicidality	Narrative synthesis	Mixed populations (including adolescents, adults, and people diagnosed with mental health conditions)	Clinical settings	Selective	Pharmacotherapy and neuromodulation interventions	Suicidality (defined as SA, SI, suicidal intent, and completed suicides)	5 High
153	(Kutcher, Wei, & Behzadi, 2017)	School- and Community-Based Youth Suicide Prevention Interventions: Hot Idea, Hot Air, or Sham?	Narrative summary	Children and adolescents	Education settings	Universal; Selective	Awareness and education	Suicide rates	1 Low
154	(Labelle et al., 2015)	A systematic review and meta-analysis of cognitive behavioural treatments for suicidal and self-harm behaviours in adolescents	Meta-analysis	Adolescents (aged 12 to 18 years)	Mixed settings	Indicated	CBT and DBT	SA and SH	2 Low to medium
155	(Lai et al., 2014)	Caught in the web: a review of web-based suicide prevention	Narrative synthesis	Mixed populations (including general community samples, telephone helpline callers, primary health care patients, and university students)	Mixed settings	All	Web-based suicide prevention strategies (including iCBT)	SI	1 Low
156	(Lapierre et al., 2011)	A systematic review of elderly suicide prevention programs	Narrative summary	Older adults (aged 60 years and older)	Mixed settings	Indicated	Mixed intervention types (including primary care interventions, community-based screening and outreach, telephone counselling,	Suicide rates	1 Low

Study citation	Title	Type of analysis	Population characteristics	Setting	Level of intervention	Intervention type	Suicide-related primary outcome(s)	Quality impression
						anti-depressants, resilience programs, and multi-faceted interventions)		
157 (Large et al., 2018)	Suicide risk assessment among psychiatric inpatients: a systematic review and meta-analysis of high-risk categories	Meta-analysis	Adult psychiatric inpatients	Clinical settings	Selective	Risk assessment using prediction models	Suicide rates	5 High
158 (Leavey & Hawkins, 2017)	Is cognitive behavioural therapy effective in reducing suicidal ideation and behaviour when delivered face-to-face or via e-health? A systematic review and meta-analysis	Meta-analysis	Mixed populations (including people who have SA, people experiencing SI, SH, or psychological distress, people with diagnosed mental health conditions (schizophrenia, psychosis, MDD, BPD, or substance misuse), people bereaved by suicide, people with epilepsy, and medical interns)	Mixed settings	Indicated	CBT	Suicidal behaviours	1 Low
159 (Lengvenyte et al., 2021)	Immediate and short-term efficacy of suicide-targeted interventions in suicidal individuals: A systematic review	Narrative synthesis	Mixed populations (including adolescents, adults (aged 25 to 45 years), people in military medical centers, in- and out-patients,	Clinical settings	Indicated	Mixed intervention types (including pharmacological, psychosocial, and neuromodulation interventions)	Suicidality (defined as SA and SI)	5 High

Study citation	Title	Type of analysis	Population characteristics	Setting	Level of intervention	Intervention type	Suicide-related primary outcome(s)	Quality impression
			patients in emergency departments, and people with diagnosed mental health conditions)					
160 (Leske et al., 2020)	Global systematic review of the effects of suicide prevention interventions in Indigenous peoples	Narrative synthesis	Indigenous communities in the United States of America, Australia, Canada, and New Zealand	Mixed settings	All	Mixed intervention types (including multi-component universal interventions, alcohol control interventions, family outreach, community events, educational programs, peer support, psychoeducation, and gatekeeper training)	Suicide rates and SA	3 Medium
161 (Lestienne et al., 2021)	An integrative systematic review of online resources and interventions for people bereaved by suicide	Narrative summary	People bereaved by suicide	Digital settings	Selective	Online support groups and resources	Suicidal behaviours	5 High
162 (Lewitzka et al., 2015)	The suicide prevention effect of lithium: More than 20 years of evidence-a narrative review	Narrative summary	People with diagnosed affective disorders	Clinical settings	Selective	Lithium	Suicide rates, SA, and SI	5 High
163 (Linde et al., 2017)	Grief interventions for people bereaved by suicide: A systematic review	Narrative synthesis	Adult samples bereaved by suicide	Mixed settings	Selective	Mixed intervention types (including CBT, bereavement groups, and writing therapy)	Grief	2 Low to medium
164 (Lopez-Castroman et al., 2020)	Mining social networks to improve suicide	Narrative summary	General community samples	Digital settings	Universal	Risk assessment using social networks	Suicidal behaviours	1 Low

Study citation	Title	Type of analysis	Population characteristics	Setting	Level of intervention	Intervention type	Suicide-related primary outcome(s)	Quality impression
	prevention: A scoping review							
165 (Luxton et al., 2013)	Can post discharge follow-up contacts prevent suicide and suicidal behavior? A review of the evidence	Narrative summary	People discharged from emergency departments or inpatient psychiatric services	In-patient settings	Indicated	Follow-up contact interventions	Suicidal behaviours	1 Low
166 (Maguire et al., 2021)	Ketamine for acute suicidality in the emergency department: A systematic review	Narrative summary	Adult samples presenting with SI or suicide behaviours	Emergency departments	Indicated	Ketamine	Suicidality	3 Medium
167 (Malakouti et al., 2020)	Effectiveness of self-help mobile telephone applications (apps) for suicide prevention: A systematic review	Narrative synthesis	Mixed populations (including general community samples, people who report self-injury, indigenous youth in rural Australia, and adolescents hospitalised due to SA)	Mixed settings	All	Mobile apps (including CBT, DBT, MBCT, relaxation, education, and awareness approaches)	Suicidal behaviours	3 Medium
168 (Mann & Michel, 2016)	Prevention of Firearm Suicide in the United States: What Works and What Is Possible	Narrative synthesis	General community samples	Mixed settings	Universal	Firearm restrictions	Suicide rates	1 Low
169 (Mann et al., 2021)	Improving suicide prevention through evidence-based strategies: A systematic review	Narrative summary	Mixed populations	Mixed settings	All	Mixed intervention types (including awareness and education, screening, pharmacotherapy, psychotherapy, brain stimulation, collaborative care, school-based interventions, internet-based interventions,	Suicidal behaviours	3 Medium

Study citation	Title	Type of analysis	Population characteristics	Setting	Level of intervention	Intervention type	Suicide-related primary outcome(s)	Quality impression
						follow-up care for SA, and means restriction)		
170 (Martinez-Miranda, 2017)	Embodied Conversational Agents for the Detection and Prevention of Suicidal Behaviour: Current Applications and Open Challenges	Narrative summary	Individuals requiring continuous counselling and support and individuals with interest to learn relevant clues in the identification of suicidal behaviours (e.g., medical students, formal and informal caregivers)	Digital settings	Indicated	Risk assessment using embodied conversational agents	Suicide behaviours	3 Medium
171 (Marzano et al., 2016)	Prevention of Suicidal Behavior in Prisons	Narrative summary	People in prison with a near lethal SA	Prison	Indicated	Mixed intervention types	Suicidal behaviours	3 Medium
172 (Mathieu et al., 2021)	Suicide and suicide attempts in the Pacific Islands: A Systematic Literature Review	Narrative summary	People living in the Pacific Islands	Clinical settings	Indicated	Mixed intervention types (including assessment, telephone interventions, and brief interventions)	SH	3 Medium
173 (McCabe et al., 2018)	Effectiveness of brief psychological interventions for suicidal presentations: a systematic review	Narrative synthesis	Mixed populations (including children, adolescent, and adult samples)	Emergency departments	Indicated	Psychotherapy and psychosocial interventions (including brief interventions, education, therapy sessions, MI, and screening)	Suicide rates, SA, and SI	2 Low to medium
174 (Meerwijk et al., 2016)	Direct versus indirect psychosocial and behavioural interventions to prevent suicide and	Meta-analysis	Mixed populations (including children, adolescent, and adult samples)	Mixed settings	Indicated	Psychotherapy and psychosocial interventions (including ABFT, PST, CBT, MBT, skill-based treatments, follow-up contact, DBT,	Suicidal thoughts and behaviours	3 Medium

Study citation	Title	Type of analysis	Population characteristics	Setting	Level of intervention	Intervention type	Suicide-related primary outcome(s)	Quality impression
	suicide attempts: a systematic review and meta-analysis					case management, community treatment, youth nominated supportive contacts, and collaborative assessment and management of suicidality)		
175 (Melia et al., 2020)	Mobile Health Technology Interventions for Suicide Prevention: Systematic Review	Narrative synthesis	Mixed populations (including veterans, indigenous youth in rural Australia, individuals with a recent and severe history of self-injurious thoughts and behaviours, and CAMHS patients (aged 12 to 17 years))	Rural settings	Selective; Indicated	Mobile apps (including ACT, CBT, coping skills, emotion regulation, and action plan approaches)	SH	4 Medium to high
176 (Mendez-Bustos et al., 2019)	Effectiveness of psychotherapy on suicidal risk: A systematic review of observational studies	Narrative synthesis	Mixed populations (including general adult community samples, people with diagnosed mental health disorders (including BPD, MDD, mood disorders, PTSD and anxiety disorders))	Mixed settings	Selective; Indicated	Psychotherapy interventions (including CBT, DBT, group therapies, IPT, psychodynamic oriented therapy, and family therapy)	SA	3 Medium
177 (Mewton & Andrews, 2016)	Cognitive behavioral therapy for suicidal behaviors: Improving patient outcomes	Narrative summary	Adult samples (aged 18 years and older), including people bereaved by suicide, people with epilepsy, and people diagnosed	Mixed settings	Selective; Indicated	CBT	Suicide-related behaviours	2 Low to medium

Study citation	Title	Type of analysis	Population characteristics	Setting	Level of intervention	Intervention type	Suicide-related primary outcome(s)	Quality impression
			with mental health conditions (including MDD, psychosis, substance abuse, and BPD)					
178 (Milner et al., 2015b)	Workplace suicide prevention: a systematic review of published and unpublished activities	Narrative synthesis	People working in government and organisations, including air force, police, army, construction, agriculture, and an information service company	Workplace settings	Universal; Selective	Mixed intervention types (including awareness and education, gatekeeper training, and counselling)	Suicide rates	2 Low to medium
179 (Milner et al., 2015a)	Letters, green cards, telephone calls and postcards: systematic and meta-analytic review of brief contact interventions for reducing self-harm, suicide attempts and suicide	Meta-analysis	People presenting to healthcare settings with suicidal behaviours or SI	Clinical settings	Indicated	Follow-up contact interventions	Suicide rates, SA, and SH	3 Medium
180 (Milner et al., 2017)	The effectiveness of suicide prevention delivered by GPs: A systematic review and meta-analysis	Meta-analysis	Mixed populations (including children, adolescent, and adult samples)	Emergency departments	Universal	Education and GP training and guidelines	Suicide rates, SA, and SH	3 Medium
181 (Mo et al., 2018)	School-based gatekeeper training programmes in	Narrative summary	School staff (including teachers,	Education settings	Selective	Gatekeeper training	Knowledge about suicide and gatekeeper skills	1 Low

Study citation	Title	Type of analysis	Population characteristics	Setting	Level of intervention	Intervention type	Suicide-related primary outcome(s)	Quality impression
	enhancing gatekeepers' cognitions and behaviours for adolescent suicide prevention: A systematic review		counsellors, social workers, and psychologists)					
182 (Morken et al., 2020)	The effects of interventions preventing self-harm and suicide in children and adolescents: An overview of systematic reviews	Narrative synthesis	Children and adolescents (aged under 18 years) with SH and those with or without an identified risk of developing problems involving SH and/or suicide	Mixed settings	All	Mixed intervention types (including awareness, screening, approaches following suicide clusters, bereavement groups, psychological interventions, and follow-up contact)	Suicide rates and SH	4 Medium to high
183 (Morton et al., 2021)	Gatekeeper training for friends and family of individuals at risk of suicide: A systematic review	Narrative summary	Family, friends, and caregivers caring for individuals who have previous experience with suicide or are at risk of suicide	Mixed settings	Selective	Mixed intervention types (including gatekeeper training, education, and ACT)	Attitudes, knowledge, self-efficacy, and suicide prevention skills	1 Low
184 (Murray et al., 2021)	Scoping Review: Suicide Specific Intervention Programmes for People Experiencing Homelessness	Narrative synthesis	People experiencing homelessness (including children (aged 11 to 14 years), young adult (aged 18 to 24 years), and adult samples)	Mixed settings	Selective; Indicated	Mixed intervention types (including family interventions, collaborative assessment and management of suicidality, CBT, and improving reasons for living)	SI	3 Medium
185 (Nasir et al., 2016)	The need for a culturally-tailored gatekeeper training intervention program in	Narrative synthesis	Indigenous people in Australia, Canada and the United States of America	Mixed settings	Selective	Gatekeeper trainings	Gatekeeper behaviours and SI	3 Medium



Study citation	Title	Type of analysis	Population characteristics	Setting	Level of intervention	Intervention type	Suicide-related primary outcome(s)	Quality impression
	preventing suicide among Indigenous peoples: a systematic review							
186 (Navin et al., 2019)	Suicide Prevention Strategies for General Hospital and Psychiatric Inpatients: A Narrative Review	Narrative summary	In-patients and hospital staff	In-patient settings	Indicated	Mixed intervention types (including barriers to prevent jumping, staff education and training, care guidelines, pharmacotherapy, psychotherapy, and brain stimulation)	Suicide rates	3 Medium
187 (Nawaz et al., 2021)	Interventions to reduce self-harm on in-patient wards: Systematic review	Narrative synthesis	In-patients	In-patient settings	Indicated	Mixed intervention types (including CBT, DBT, PST, positive psychology-based skills, and ward-based interventions (including safe wards, zonal nursing, and staff trainings))	SH	4 Medium to high
188 (Nelson et al., 2017)	Suicide Risk Assessment and Prevention: A Systematic Review Focusing on Veterans	Qualitative analysis	Veterans	Mixed settings	All	Risk assessment using electronic medical records and clinician and patient instruments	Suicide rates and other suicidal self-directed violence	1 Low
189 (Noh et al., 2016)	Effectiveness of Telephone-Delivered Interventions Following Suicide Attempts: A Systematic Review	Meta-analysis	Suicide attempters	Clinical settings	Indicated	Telephone-delivered interventions and crisis cards	Suicide rates, SA, and SH	3 Medium
190 (Nuij et al., 2021)	Safety planning-type interventions for suicide prevention: Meta-analysis	Meta-analysis	Mixed populations (including active duty soldiers, adults presenting to emergency	Clinical settings	Indicated	Mixed intervention types (including safety planning, screening, brief interventions, and crisis postcards)	Suicidal behaviours	4 Medium to high

Study citation	Title	Type of analysis	Population characteristics	Setting	Level of intervention	Intervention type	Suicide-related primary outcome(s)	Quality impression
			departments, veterans, and adults referred to a prevention center or case management services)					
191 (O'Connor et al., 2013)	Screening for and treatment of suicide risk relevant to primary care: a systematic review for the U.S. Preventive Services Task Force	Meta-analysis	General community samples	Primary care settings	Universal	Mixed intervention types (including risk assessment instruments, psychotherapy, pharmacotherapy, and enhanced usual care)	Suicide rates and SA	5 High
192 (Okamura, Ikeshita, Kimoto, Makinodan, & Kishimoto, 2021)	Suicide prevention in Japan: Government and community measures, and high-risk interventions	Narrative summary	Mixed populations (including general community samples, rural populations, children, adolescents, male samples, and older adults)	Rural settings	All	Mixed intervention types (including policy strategies, community suicide prevention initiatives, and strategic studies for suicide prevention)	Suicide rates	3 Medium
193 (Okolie et al., 2017)	A systematic review of interventions to prevent suicidal behaviors and reduce suicidal ideation in older people	Narrative synthesis	Older adults (aged over 60 years)	Clinical settings	All	Mixed intervention types (including pharmacotherapy, psychotherapy, community-based multilevel programs, community-based telephone counseling, and primary care-based interventions)	Suicidal behaviours (defined as suicide rates, SA, and SH)	3 Medium
194 (Okolie et al., 2020a)	Means restriction for the prevention of suicide on roads	Narrative summary	Mixed populations	Mixed settings	Universal	Means restriction	Suicide rates	5 High

<b>Study citation</b>	<b>Title</b>	<b>Type of analysis</b>	<b>Population characteristics</b>	<b>Setting</b>	<b>Level of intervention</b>	<b>Intervention type</b>	<b>Suicide-related primary outcome(s)</b>	<b>Quality impression</b>
195 (Okolie et al., 2020b)	Means restriction for the prevention of suicide by jumping	Meta-analysis	General community samples	Mixed settings	Universal	Means restriction (including structural barriers, road access restriction, safety nets, crisis signs, and CCTV cameras)	Suicide rates, SA, SH, and cost-effectiveness of interventions	5 High
196 (Onie et al., 2021)	The use of closed-circuit television and video in suicide prevention: narrative review and future directions	Narrative summary	General community samples	Digital settings	Universal	Risk assessment using video surveillance	Suicide rates and SA	5 High
197 (Ougrin & Latif, 2011)	Specific psychological treatment versus treatment as usual in adolescents with self-harm: systematic review and meta-analysis	Meta-analysis	Children and adolescents (up to the age of 18) who have engaged in SH at least once	Mixed settings	Indicated	Psychotherapy interventions (including PST, CBT, DBT, family therapy, psychotherapy, and cognitive analytic therapy)	Suicidality and SH	1 Low
198 (Ougrin et al., 2015)	Therapeutic interventions for suicide attempts and self-harm in adolescents: systematic review and meta-analysis	Meta-analysis	Children and adolescents (up to 18 years of age) with SH	Mixed settings	Indicated	Psychotherapy and psychosocial interventions (including PST, CBT, DBT, ABFT, MBT, family therapies, cognitive analytic therapy, therapeutic assessment, emotion regulation group training, and youth-nominated support teams)	SA and SH	2 Low to medium
199 (Padmanathan et al., 2020)	Prevention of suicide and reduction of self-harm among people with substance use disorder: A	Meta-analysis	Youth and adults with diagnosed mental health conditions (including substance use	Clinical settings	Selective; Indicated	Mixed intervention types (pharmacology, psychotherapies, and substance abuse interventions)	SH	3 Medium

<b>Study citation</b>	<b>Title</b>	<b>Type of analysis</b>	<b>Population characteristics</b>	<b>Setting</b>	<b>Level of intervention</b>	<b>Intervention type</b>	<b>Suicide-related primary outcome(s)</b>	<b>Quality impression</b>
	systematic review and meta-analysis of randomised controlled trials		disorders, MDD, and BPD)					
200 (Pirkis et al., 2013)	The effectiveness of structural interventions at suicide hotspots: a meta-analysis	Meta-analysis	Mixed populations	Mixed settings	Universal	Means restriction (structural barriers)	Suicide rates	5 High
201 (Pirkis et al., 2015)	Interventions to reduce suicides at suicide hotspots: a systematic review and meta-analysis	Meta-analysis	General community samples	Community settings	Universal	Means restriction at suicide hotspots	Suicide rates	5 High
202 (Pirkis et al., 2019b)	Suicide Prevention Media Campaigns: A Systematic Literature Review	Narrative summary	Mixed populations (including general community samples, children, adolescents, veterans, and university students)	Mixed settings	Universal	Media guidelines	Suicide rates	3 Medium
203 (Pistone et al., 2019)	The effects of educational interventions on suicide: A systematic review and meta-analysis	Meta-analysis	Children and adolescents	Education settings	Universal	Education and gatekeeper trainings	Suicidal behaviours (SA and SI)	4 Medium to high
204 (Polihronis et al., 2020)	What's the harm in asking? A systematic review and meta-analysis on the risks of asking about suicide-related behaviors and self-harm with quality appraisal	Meta-analysis	Mixed populations (including children, adolescents, adults, people diagnosed with mental health conditions (including depression and	Community settings	Selective; Indicated	Risk assessment	NSSI, SA, SI, and suicide rates	5 High

Study citation	Title	Type of analysis	Population characteristics	Setting	Level of intervention	Intervention type	Suicide-related primary outcome(s)	Quality impression
			personality disorders), psychiatric in-patients, and people presenting with suicidal behaviours or SI)					
205 (Pollock et al., 2020)	Global goals and suicide prevention in the Circumpolar North	Narrative summary	Indigenous people in the Circumpolar North	Mixed settings	Universal; Selective	Indigenous led suicide prevention strategies	Suicide rates	3 Medium
206 (Pompili et al., 2015)	Suicide in stroke survivors: epidemiology and prevention	Narrative summary	Post-stroke patients	Mixed settings	Selective; Indicated	Mixed intervention types (including pharmacotherapy, psychotherapy, and ECT)	SH and SI	1 Low
207 (Quinlivan et al., 2016)	Which are the most useful scales for predicting repeat self-harm? A systematic review evaluating risk scales using measures of diagnostic accuracy	Narrative synthesis	Adults presenting with suicidal behaviours or SI	Clinical settings	Indicated	Risk assessment instruments	SA and SH	5 High
208 (Raj et al., 2021)	The mindfulness trajectories of addressing suicidal behaviour: A systematic review	Narrative synthesis	Mixed populations (including school students, tertiary students, people diagnosed with mental health conditions (including MDD and BPD), cancer patients, and veterans)	Mixed settings	Selective; Indicated	Mindfulness-based interventions	Suicidal behaviours	3 Medium

<b>Study citation</b>	<b>Title</b>	<b>Type of analysis</b>	<b>Population characteristics</b>	<b>Setting</b>	<b>Level of intervention</b>	<b>Intervention type</b>	<b>Suicide-related primary outcome(s)</b>	<b>Quality impression</b>
209 (Ramsey et al., 2021)	Implementing changes after patient suicides in mental health services: A systematic review	Narrative synthesis	General community samples, including individuals who have died by suicide	Mixed settings	All	Recommendations in serious adverse incident reviews	Suicide rates	3 Medium
210 (Redvers et al., 2015)	A scoping review of Indigenous suicide prevention in circumpolar regions	Narrative summary	Indigenous people in the Circumpolar North	Mixed settings	Universal; Selective	Policy and prevention initiatives	NA (reviewed intervention characteristics)	2 Low to medium
211 (Reifels et al., 2019)	Outcomes of Community-Based Suicide Prevention Approaches That Involve Reducing Access to Pesticides: A Systematic Literature Review	Narrative summary	General community samples	Mixed settings	Universal	Pesticide restrictions	Suicide rates and SA	3 Medium
212 (Reinstatler & Youssef, 2015)	Ketamine as a potential treatment for suicidal ideation: a systematic review of the literature	Narrative synthesis	People presenting to emergency departments with SI and/or MDD or TRD	Emergency departments	Indicated	Ketamine	SI	3 Medium
213 (Riblet et al., 2017)	Strategies to prevent death by suicide: meta-analysis of randomised controlled trials	Meta-analysis	Mixed populations	Mixed settings	Selective; Indicated	Mixed intervention types (including means restriction, pharmacotherapy, brief contact interventions, education and awareness trainings, CBT, neuromodulation, and hospital care interventions)	Suicide rates, SA, and SH	3 Medium

<b>Study citation</b>	<b>Title</b>	<b>Type of analysis</b>	<b>Population characteristics</b>	<b>Setting</b>	<b>Level of intervention</b>	<b>Intervention type</b>	<b>Suicide-related primary outcome(s)</b>	<b>Quality impression</b>
214 (Ridani et al., 2015)	Suicide prevention in Australian Aboriginal communities: a review of past and present programs	Qualitative content analysis	Australian Aboriginal people	Mixed settings	Universal	Mixed intervention types (including creative means, pamphlets, counseling, peer support, reducing access to means, reducing access to alcohol, community awareness, and cultural activities)	NA (focused on protective factors including connectedness and belongingness)	5 High
215 (Robinson et al., 2013)	A systematic review of school-based interventions aimed at preventing, treating, and responding to suicide-related behavior in young people	Narrative summary	Children and adolescents	Education settings	All	Mixed intervention types	Suicide rates, SA, SI and SH	3 Medium
216 (Robinson et al., 2018a)	What Works in Youth Suicide Prevention? A Systematic Review and Meta-Analysis	Meta-analysis	Children and adolescents	Mixed settings	All	Mixed intervention types (including CBT, DBT, family therapy, brief contact interventions, education, screening, and multimodal interventions)	SH	3 Medium
217 (Robinson et al., 2018b)	Suicide prevention in educational settings: a review	Narrative synthesis	School and tertiary students	Education settings	Universal; Indicated	Psychosocial interventions (including psychoeducation, social support, and coping skill trainings)	Suicide related outcomes	2 Low to medium
218 (Rojas et al., 2020)	A Review of Telemental Health as a Modality to Deliver Suicide-Specific Interventions for Rural Populations	Narrative summary	People expressing suicidal behaviour or SH	Rural populations	Indicated	Telemental health	Hospitalisation	3 Medium

<b>Study citation</b>	<b>Title</b>	<b>Type of analysis</b>	<b>Population characteristics</b>	<b>Setting</b>	<b>Level of intervention</b>	<b>Intervention type</b>	<b>Suicide-related primary outcome(s)</b>	<b>Quality impression</b>
219 (Rostami et al., 2021)	A Systematic Review of Suicide Prevention Interventions in Military Personnel	Narrative summary	Military samples	Mixed settings	All	Mixed intervention types	Suicide rates, SA, and SI	5 High
220 (Rozek et al., 2021)	Addressing co-occurring suicidal thoughts and behaviors and posttraumatic stress disorder in evidence-based psychotherapies for adults: A systematic review	Narrative synthesis	People diagnosed with mental health conditions (including PTSD)	Mixed settings	Selective; Indicated	Psychotherapy interventions (including CBT, DBT, present-centered therapy, narrative exposure therapy, and exposure focused therapy)	Suicide-related outcomes	3 Medium
221 (Runeson et al., 2017)	Instruments for the assessment of suicide risk: A systematic review evaluating the certainty of the evidence	Meta-analysis	Children, adolescents, and adults	Clinical settings	Universal	Risk assessment instruments	Suicide rates and SA	5 High
222 (Russell et al., 2021)	Vulnerable yet forgotten? A systematic review identifying the lack of evidence for effective suicide interventions for young people in contact with child protection systems	Narrative summary	Children and adolescents involved with residential, foster, or kinship out of home arrangements and the guardians, carers, or residential care staff who work with this population	Mixed settings	All	Mixed intervention types (including gatekeeper trainings, emotion regulation therapy, and multidimensional treatment foster care)	Suicide rates, SA, and SI	3 Medium
223 (Russon et al., 2021b)	Suicide among LGBTQIA+ youth: A review of the treatment literature	Narrative synthesis	LGBTQIA+ youth	Mixed settings	Selective; Indicated	ABFT	Suicide (defined as SA, SH, and SI)	3 Medium



<b>Study citation</b>	<b>Title</b>	<b>Type of analysis</b>	<b>Population characteristics</b>	<b>Setting</b>	<b>Level of intervention</b>	<b>Intervention type</b>	<b>Suicide-related primary outcome(s)</b>	<b>Quality impression</b>
224 (Saab et al., 2021)	Suicide and Self-Harm Risk Assessment: A Systematic Review of Prospective Research	Narrative synthesis	Adults with a history of suicide or SH	Emergency departments	Indicated	Risk assessment instruments	Suicide rates, SH, and SI	5 High
225 (Sakinofsky, 2014)	Preventing suicide among inpatients	Qualitative analysis	In-patients (aged above 17 years)	In-patient settings	Indicated	Ward environment modifications (including optimizing patient visibility, supervising patients appropriately, careful assessment, awareness of and respect for suicide risk, good teamwork and communication, and adequate clinical treatment)	SA and SH	1 Low
226 (Sarchiapone et al., 2011)	Controlling access to suicide means	Narrative synthesis	Mixed populations	Mixed settings	Universal	Means restriction (including toxic domestic gas, catalytic converters in motor vehicles, firearms, pesticides, barbiturates, paracetamol, anti-depressants, barriers at jumping sites, safe rooms in institutional settings to prevent hanging, and media reports of suicide)	Suicide rates	1 Low
227 (Saunders & Smith, 2016)	Interventions to prevent self-harm: what does the evidence say?	Narrative summary	Mixed populations (including children, adolescents, adults, and people with diagnosed mental health conditions)	Mixed settings	Indicated	Mixed intervention types	SH	1 Low

<b>Study citation</b>	<b>Title</b>	<b>Type of analysis</b>	<b>Population characteristics</b>	<b>Setting</b>	<b>Level of intervention</b>	<b>Intervention type</b>	<b>Suicide-related primary outcome(s)</b>	<b>Quality impression</b>
228 (Schlichthorst et al., 2020)	Lived experience peer support programs for suicide prevention: A systematic scoping review	Narrative summary	Youth and adults with lived experience of suicidality	Mixed settings	Indicated	Peer support interventions	NA (acceptability and feasibility)	3 Medium
229 (Schmelefske et al., 2020)	The Effects of Mindfulness-Based Interventions on Suicide Outcomes: A Meta-Analysis	Meta-analysis	Mixed populations (including adolescents, tertiary students, adults, in- and out-patients, African American hospital patients, juvenile correctional facility inmates, people with a history of suicide and SH, people diagnosed with depression, and people with current suicide risk or a recent SA)	Mixed settings	Selective; Indicated	Mindfulness based interventions (including MBCT, Mindfulness Skills for Students Course, Grady Compassion and Mindfulness Program, mindfulness components of DBT, and skills to enhance positivity (STEP program))	SI	3 Medium
230 (Serafini et al., 2018)	The Efficacy of Buprenorphine in Major Depression, Treatment-Resistant Depression and Suicidal Behavior: A Systematic Review	Narrative summary	People diagnosed with MDD and significant SI	Clinical settings	Indicated	Buprenorphine	NSSI and SI	3 Medium
231 (Serafini et al., 2021)	Effects of repetitive transcranial magnetic	Narrative summary	Adolescent and adult clinical populations with SI/ SA and a	Clinical settings	Selective; Indicated	Repetitive transcranial magnetic stimulation	Suicidal behaviours	2 Low to medium

Study citation	Title	Type of analysis	Population characteristics	Setting	Level of intervention	Intervention type	Suicide-related primary outcome(s)	Quality impression
	stimulation on suicidal behavior: A systematic review		psychiatric diagnosis such as MDD, BP, and TRD					
232 (Shand et al., 2021)	Can government responses to unemployment reduce the impact of unemployment on suicide? A systematic review	Narrative summary	People who are unemployed	Government	Universal	Government policies	Suicide rates	1 Low
233 (Siegel et al., 2021)	Anti-suicidal and antidepressant effects of ketamine and esketamine in patients with baseline suicidality: A systematic review	Qualitative analysis	Individuals with moderate to high suicidality scores and a psychiatric diagnosis	Clinical settings	Selective; Indicated	Ketamine	Suicidality	5 High
234 (Smith & Cipriani, 2017)	Lithium and suicide in mood disorders: Updated meta-review of the scientific literature	Meta-analysis	People diagnosed with mood disorders	Clinical settings	Selective	Lithium	Suicide rates and SH	5 High
235 (Sobanski et al., 2021)	Psychotherapeutic interventions for the prevention of suicide re-attempts: a systematic review	Meta-analysis	Adult samples (aged 18 years and above)	Clinical settings	Indicated	Psychotherapy interventions (including CBT, DBT, psychodynamic approaches, and problem-solving therapy)	Suicide rates and SA	4 Medium to high
236 (Sonke et al., 2021)	Systematic Review of Arts-Based Interventions to Address Suicide Prevention and Survivorship in Australia, Canada, the United	Narrative summary	Mixed populations	Mixed settings	Indicated	Art based interventions (including film, television, mixed-arts, theatre, and quilting)	Suicide rates	3 Medium

Study citation	Title	Type of analysis	Population characteristics	Setting	Level of intervention	Intervention type	Suicide-related primary outcome(s)	Quality impression
	Kingdom, and the United States of America							
237 (Soomro & Kakhi, 2015)	Deliberate self-harm (and attempted suicide)	Narrative summary	Adolescents and adults	Mixed settings	Indicated	Mixed intervention types (including CBT, DBT, PST, IPT, care management, emergency cards, hospital admission, intensive outpatient follow-up, nurse-led case management, and telephone contact)	Repetition of SH	1 Low
238 (Stefanopoulou et al., 2020)	Are digital interventions effective in reducing suicidal ideation and self-harm? A systematic review	Narrative synthesis	General adult samples (aged between 18 and 65 years)	Mixed settings	Selective; Indicated	Digital interventions (including iCBT, iDBT MBCT, i-ACT, and multi-component interventions)	SH	3 Medium
239 (Stewart & Lees-Deutsch, 2022)	Risk Assessment of Self-Injurious Behavior and Suicide Presentation in the Emergency Department: An Integrative Review	Narrative summary	Adults presenting to emergency departments with SH or SI	Emergency departments	Selective	Risk assessment instruments	Suicide rates, SA, and SH	3 Medium
240 (Struszczyk et al., 2019)	Men and suicide prevention: a scoping review	Qualitative thematic analysis	Male samples, including adolescents and adults	Mixed settings	Selective	Mixed intervention types (including awareness campaigns, gatekeeper trainings, psychological support, and trainings of healthcare professionals)	SA	1 Low
241 (Sullivan et al., 2021a)	Group treatments for individuals at risk for suicide: A PRISMA scoping review (ScR)	Narrative summary	Mixed populations (including adolescents, young adults and adults)	Mixed settings	Indicated	Mixed psychotherapy and psychosocial support interventions	Suicide severity and suicidal impulse	2 Low to medium

<b>Study citation</b>	<b>Title</b>	<b>Type of analysis</b>	<b>Population characteristics</b>	<b>Setting</b>	<b>Level of intervention</b>	<b>Intervention type</b>	<b>Suicide-related primary outcome(s)</b>	<b>Quality impression</b>
242 (Sullivan et al., 2021b)	Family Treatments for Individuals at Risk for Suicide	Narrative summary	Mixed populations (including children and adolescent patients (under 18 years of age) at risk of suicide	Mixed settings	Selective	Psychotherapy and psychosocial interventions (including ABFT, brief interventions, CBT, DBT, and safety planning)	Suicide rates	2 Low to medium
243 (Surgenor et al., 2016)	Ten recommendations for effective school-based, adolescent, suicide prevention programs	Narrative summary	Adolescents (aged 12 to 18 years)	Education settings	Universal; Selective	Mixed intervention types (including gatekeeper trainings, education or awareness, peer leadership, skills trainings, and screening or assessment programs)	Suicidal behaviours	3 Medium
244 (Swift et al., 2021)	The effectiveness of the Collaborative Assessment and Management of Suicidality (CAMS) compared to alternative treatment conditions: A meta-analysis	Meta-analysis	Mixed populations (including general adult samples, active duty soldiers, and veterans)	Clinical settings	Indicated	Collaborative assessment and management of suicidality	SA and SH	4 Medium to high
245 (Szlyk & Tan, 2020)	The Role of Technology and the Continuum of Care for Youth Suicidality: Systematic Review	Narrative synthesis	Children and adolescents (aged 12 to 24 years)	Digital settings	All	School- and university-based universal interventions	Suicidality (defined as SA and SI)	2 Low to medium
246 (Szumilas & Kutcher, 2011)	Post-suicide intervention programs: a systematic review	Narrative synthesis	Mixed populations	Mixed settings	Indicated	School, family, and community based postvention programs	Suicidal behaviour (defined as SA and SI)	1 Low
247 (Tighe et al., 2018)	Efficacy of Acceptance and Commitment	Narrative synthesis	Mixed populations (including adolescents,	Mixed settings	Indicated	ACT	SH	3 Medium

<b>Study citation</b>	<b>Title</b>	<b>Type of analysis</b>	<b>Population characteristics</b>	<b>Setting</b>	<b>Level of intervention</b>	<b>Intervention type</b>	<b>Suicide-related primary outcome(s)</b>	<b>Quality impression</b>
	Therapy in Reducing Suicidal Ideation and Deliberate Self-Harm: Systematic Review		Aboriginal and Torres Strait Islander Australian youth, veterans, diagnosed mental health disorders, and psychiatric patients)					
248 (Timberlake et al., 2020)	Non-Suicidal Self-Injury: Management on the Inpatient Psychiatric Unit	Narrative summary	Mixed populations (including adolescents, adults, and psychiatric in-patients)	In-patient settings	Indicated	Mixed intervention types	NSSI	1 Low
249 (Tondo & Baldessarini, 2018)	Anti-suicidal Effects in Mood Disorders: Are They Unique to Lithium?	Meta-analysis	People diagnosed with mood disorders	Clinical settings	Selective	Lithium	Suicide rates and SA	3 Medium
250 (Torok et al., 2017)	A Systematic Review of Mass Media Campaigns for Suicide Prevention: Understanding Their Efficacy and the Mechanisms Needed for Successful Behavioral and Literacy Change	Narrative synthesis	General community samples	Community settings	Universal	Media guidelines	Suicide rates and SA	3 Medium
251 (Torok et al., 2019)	Preventing adolescent suicide: A systematic review of the effectiveness and change mechanisms of	Qualitative analysis	School staff and parents	Mixed settings	Selective	Gatekeeper trainings	Knowledge, self-efficacy, attitudes, and gatekeeper behaviours	1 Low

Study citation	Title	Type of analysis	Population characteristics	Setting	Level of intervention	Intervention type	Suicide-related primary outcome(s)	Quality impression
	suicide prevention gatekeeping training programs for teachers and parents							
252 (Torok et al., 2020)	Suicide prevention using self-guided digital interventions: a systematic review and meta-analysis of randomised controlled trials	Meta-analysis	Youth, adults, and intern healthcare professionals	Mixed settings	Universal; Indicated	Digital psychosocial interventions (including ACT, CBT, DBT, and mindfulness approaches)	SA	5 High
253 (Turecki & Brent, 2016)	Suicide and suicidal behaviour	Narrative summary	Mixed populations (including youth, adults, air force employees, people diagnosed with a mental health conditions, psychiatric in- and out-patients)	Mixed settings	All	Mixed intervention types (including awareness and gatekeeper trainings, community-based interventions, means restrictions, active contact follow-up, pharmacotherapy, neuromodulation, and psychotherapy interventions)	Suicide rates and suicidal behaviour	1 Low
254 (Turner et al., 2014)	Treating nonsuicidal self-injury: a systematic review of psychological and pharmacological interventions	Narrative synthesis	Adolescents and adults presenting with suicidal behaviours and SI	Community settings	Indicated	Pharmacotherapy and psychotherapy interventions	NSSI	3 Medium
255 (van Der Feltz-Cornelis et al., 2011)	Best practice elements of multilevel suicide prevention strategies: a review of systematic reviews	Narrative synthesis	Mixed populations (including general community samples, children, adolescents, previous suicide attempters, older	Mixed settings	All	Mixed intervention types (including training of GPs, public awareness campaigns, gatekeeper trainings, means restriction, and improving access to care)	Suicide rates and SA	1 Low

Study citation	Title	Type of analysis	Population characteristics	Setting	Level of intervention	Intervention type	Suicide-related primary outcome(s)	Quality impression	
			adults, ethnic minorities, and psychiatric patients)						
256	(Villarreal-Otalora, Jennings, & Mowbray, 2019)	Clinical interventions to reduce suicidal behaviors in Hispanic adolescents: A scoping review	Narrative synthesis	Hispanic adolescents (aged under 18 years)	Mixed settings	Selective; Indicated	Mixed intervention types (including DBT, in- and out-patient mental health services, emergency room/crisis stabilisation, and depression literacy outreach programs)	Suicidal behaviour	1 Low
257	(Vita et al., 2015)	Lithium in drinking water and suicide prevention: A review of the evidence	Narrative summary	General community samples in Greece, Japan, Texas, Austria, and England	Community settings	Universal	Lithium in drinking water	Suicide rates	3 Medium
258	(Wallace et al., 2021)	Empirically Evaluated Suicide Prevention Program Approaches for Older Adults: A Review of the Literature from 2009-2021	Narrative summary	Older adults (aged over 60 years)	Mixed settings	All	Mixed intervention types (including care management, gatekeeper training, community-based outreach, PST, and IPT)	Suicide rates	1 Low
259	(Wasserman, Carli, Iosue, Javed, & Herrman, 2021)	Suicide prevention in childhood and adolescence: a narrative review of current knowledge on risk and protective factors and effectiveness of interventions	Narrative synthesis	Children and adolescents (aged up to 18 years)	Mixed settings	All	Mixed intervention types (including means restriction, awareness and skill trainings, gatekeeper programs, screening interventions, interventions for high-risk youth, and digital interventions)	Suicide rates and suicidal behaviour	1 Low
260	(Wei, Kutcher, & LeBlanc, 2015)	Hot idea or hot air: A systematic review of evidence	Narrative summary	Children and adolescents	Mixed settings	Universal	Signs of Suicide and Yellow Ribbon intervention packages	Suicide rates and suicidal behaviour	5 High



Study citation	Title	Type of analysis	Population characteristics	Setting	Level of intervention	Intervention type	Suicide-related primary outcome(s)	Quality impression
	for two widely marketed youth suicide prevention programs and recommendations for implementation							
261 (Wilcox et al., 2016)	Data Linkage Strategies to Advance Youth Suicide Prevention: A Systematic Review for a National Institutes of Health Pathways to Prevention Workshop	Narrative summary	Children, adolescents and young adults (aged up to 26 years)	Mixed settings	All	Data system linkage	Suicide rates, SA, and SI	1 Low
262 (Wilkinson et al., 2018)	The Effect of a Single Dose of Intravenous Ketamine on Suicidal Ideation: A Systematic Review and Individual Participant Data Meta-Analysis	Meta-analysis	People diagnosed with mental health conditions (most commonly MDD or PTSD)	Clinical settings	Selective	Ketamine	SI	5 High
263 (Wilkinson et al., 2021)	Pharmacological and somatic treatment effects on suicide in adults: A systematic review and meta-analysis	Meta-analysis	People diagnosed with mental health conditions	Clinical settings	Selective	Neuromodulation and pharmacological interventions	Suicide rates	5 High
264 (Wilson et al., 2021b)	Adherence to guideline creation recommendations for suicide prevention in the	Narrative summary	Suicidal patients in the emergency department	Emergency departments	Indicated	Clinical practice guidelines	NA (adherence to clinical guidelines)	4 Medium to high

Study citation	Title	Type of analysis	Population characteristics	Setting	Level of intervention	Intervention type	Suicide-related primary outcome(s)	Quality impression
	emergency department: A systematic review							
265 (Winicov, 2019)	A systematic review of behavioral health interventions for suicidal and self-harming individuals in prisons and jails	Narrative summary	People in prison	Prison	All	CBT, DBT, and peer prevention programs	SH	1 Low
266 (Winter et al., 2013)	A systematic review of the literature on counselling and psychotherapy for the prevention of suicide: 1. Quantitative outcome and process studies	Meta-analysis	Mixed populations (including children, adolescents, and adults)	Mixed settings	Indicated	Psychotherapy interventions (including CBT, DBT, and problem-solving therapy)	SA and SH	3 Medium
267 (Witt et al., 2017a)	Effectiveness of suicide prevention programs for emergency and protective services employees: A systematic review and meta-analysis	Meta-analysis	First responders including military personnel, police, and fire fighters	Community settings	Universal	Environmental modifications	Suicide rates	5 High
268 (Witt et al., 2017b)	Effectiveness of online and mobile telephone applications ('apps') for the self-management of suicidal ideation and self-harm: a systematic review and meta-analysis	Meta-analysis	General community samples	Mixed settings	Selective; Indicated	Digital interventions utilising CBT, mindfulness, ACT, PST, IPT, mood monitoring, and crisis planning	SA	4 Medium to high

<b>Study citation</b>	<b>Title</b>	<b>Type of analysis</b>	<b>Population characteristics</b>	<b>Setting</b>	<b>Level of intervention</b>	<b>Intervention type</b>	<b>Suicide-related primary outcome(s)</b>	<b>Quality impression</b>
269 (Witt et al., 2020b)	Ketamine for suicidal ideation in adults with psychiatric disorders: A systematic review and meta-analysis of treatment trials	Meta-analysis	Adults with diagnosed mental health conditions	Clinical settings	Selective	Ketamine and Esketamine	Suicide rates, SA, and SI	5 High
270 (Witt et al., 2021a)	Effect of alcohol interventions on suicidal ideation and behaviour: A systematic review and meta-analysis	Meta-analysis	Mixed populations (including adults admitted to the emergency department or referred to mental health services, people with diagnosed mental health disorders, adolescent out- and in-patients, adults who had made a SA in the last 3-months, adults convicted of a violent offence committed whilst under the influence of alcohol, and adults reporting SI and problematic alcohol use)	Mixed settings	Selective; Indicated	Alcohol abuse interventions	SH, NSSI, and suicidal behaviour	5 High
271 (Witt et al., 2021b)	Interventions for self-harm in children and adolescents	Meta-analysis	Children and adolescents who had engaged in at least one instance of SH	Mixed settings	Indicated	Psychotherapy and psychosocial interventions (including group therapies, CBT, DBT, MBT, IPT, emotion regulation psychotherapy, case	Repetition of SH	5 High

Study citation	Title	Type of analysis	Population characteristics	Setting	Level of intervention	Intervention type	Suicide-related primary outcome(s)	Quality impression
						management, remote contact interventions, and multimodal interventions)		
272 (Witt et al., 2020a)	Pharmacological interventions for self-harm in adults	Meta-analysis	Adults (aged 18 years or older) who have presented to hospital or clinical services with a episode of SH within past 6 months	Clinical settings	Indicated	Pharmacological agents or natural products	Repetition of SH	5 High
273 (Wolitzky-Taylor et al., 2020)	Suicide prevention on college campuses: What works and what are the existing gaps? A systematic review and meta-analysis	Meta-analysis	Tertiary students and staff (including faculty, mental health professionals, student residential advisors)	Education settings	Universal; Selective	Mixed intervention types (including gatekeeper trainings and psychotherapy interventions for selected youth (including CBT and DBT))	Knowledge about suicide and skills for addressing suicidal thoughts and behaviours	3 Medium
274 (Woodford et al., 2019)	Accuracy of Clinician Predictions of Future Self-Harm: A Systematic Review and Meta-Analysis of Predictive Studies	Meta-analysis	Mixed populations (including adolescents, adults, veterans, psychiatric in-patients, and people with SI and suicidal behaviours)	Emergency departments	Indicated	Clinician risk assessment	Suicide rates, SA, and SH	5 High
275 (Wyart et al., 2012)	Preventing late life suicide	Narrative summary	Older adults (aged over 60 years)	Primary care settings	Universal; Selective; Indicated	Mixed intervention types (including community based outreach programs, telephone counseling program, and depression management in primary care)	Suicides rates and SA	1 Low
276 (Xiong et al., 2021)	The acute anti-suicidal effects of	Meta-analysis	Adults diagnosed with MDD or BP	Clinical settings	Selective	Ketamine and Esketaime	SI	5 High

Study citation	Title	Type of analysis	Population characteristics	Setting	Level of intervention	Intervention type	Suicide-related primary outcome(s)	Quality impression
	single-dose intravenous ketamine and intranasal esketamine in individuals with major depression and bipolar disorders: A systematic review and meta-analysis							
277 (Yerevanian & Choi, 2013)	Impact of psychotropic drugs on suicide and suicidal behaviors	Qualitative analysis	Adults diagnosed with BP	Clinical settings	Selective	Psychotropic drugs	Suicide rates and suicidal behaviour	1 Low
278 (Yiu et al., 2021)	A systematic review and meta-analysis of psychosocial interventions aiming to reduce risks of suicide and self-harm in psychiatric inpatients	Meta-analysis	Adults with diagnosed mental health conditions	In-patient settings	Indicated	Psychotherapy and psychosocial interventions (including CBT, DBT, gratitude journal, and peer support)	Suicidality (defined as SI)	4 Medium to high
279 (Yonemoto et al., 2019)	Gatekeeper training for suicidal behaviors: A systematic review	Narrative summary	Mixed populations (including college staff (residential advisors and faculty members), police officers, community members (social service agencies, schools, and churches), community facilitators (teachers,	Mixed settings	Universal	Gatekeeper training	Gatekeeper knowledge and self-efficacy	3 Medium

Study citation	Title	Type of analysis	Population characteristics	Setting	Level of intervention	Intervention type	Suicide-related primary outcome(s)	Quality impression
			pharmacists, nurses, clergy, social workers, counsellors, carers for elderly), nursing home staff and support staff, and Japanese American stakeholders)					
280 (Yu et al., 2021)	Effectiveness of internet-based cognitive behavioral therapy for suicide: a systematic review and meta-analysis of RCTs	Meta-analysis	Adolescents and adults	Digital settings	Indicated	iCBT	SI	4 Medium to high
281 (Yuan, Kwok, & Ougrin, 2019)	Treatment engagement in specific psychological treatment vs. treatment as usual for adolescents with self-harm: Systematic review and meta-analysis	Meta-analysis	Adolescents (aged under 18 years) including some samples with diagnosed mental health disorders (including BPD and alcohol or cannabis use disorder)	Mixed settings	Indicated	Psychotherapy and psychosocial interventions (including family-based therapies, CBT, DBT, PST, ABFT, group therapies, motivational interviewing, and therapeutic assessment)	SH	4 Medium to high
282 (Zalsman et al., 2016)	Suicide prevention strategies revisited: 10-year systematic review	Narrative summary	Mixed populations (including general community samples, children, adolescents, older adults, male samples, people with diagnosed mental health conditions (BP, major affective	Mixed settings	All	Mixed intervention types (including means restriction, pharmacological interventions, neuromodulation, psychotherapy, case management, follow-up contact, and population-level interventions)	SA	4 Medium to high

Study citation	Title	Type of analysis	Population characteristics	Setting	Level of intervention	Intervention type	Suicide-related primary outcome(s)	Quality impression	
			disorder, schizophrenia, MDD, BPD), psychiatric in- and out-patients, African American women, primary care physicians, school teachers, indigenous peoples in Australia, United States of America, Canada, and New Zealand, veterans, counselling staff for veterans, and crisis line callers)						
283	(Zeoli et al., 2019)	The association of firearm laws with firearm outcomes among children and adolescents: a scoping review	Narrative synthesis	Children and adolescents	Mixed settings	Universal	Firearm means restriction	Firearm injuries	1 Low
284	(Zeppegno et al., 2019)	Psychosocial Suicide Prevention Interventions in the Elderly: A Mini-Review of the Literature	Qualitative analysis	Older adults	Mixed settings	Selective; Indicated	Psychotherapy and psychosocial interventions (including care management, telehealth interventions, IPT, and PST)	Suicide behaviours	2 Low to medium
285	(Zhang, 2021)	Evidence-Based Suicide Screening and Prevention Protocol for Licensed Nursing Staff: A Systematic Literature Review	Narrative summary	Adults aged above 18 years (including the general public, clinical staff, and people in emergency departments)	Mixed settings	All	Staff training on suicide detection, assessment, and prevention, and universal suicide screening	Suicides rates and SA	3 Medium

Study citation	Title	Type of analysis	Population characteristics	Setting	Level of intervention	Intervention type	Suicide-related primary outcome(s)	Quality impression
	and Recommendations							



## Appendix C: Information provided by Te Rau Ora

The following content is verbatim as shared by Te Rau Ora.

In the year 2022, 130 whānau are reported to have attended a Tiaki Whānau Tiaki Ora suicide prevention wānanga, of whom n = 90 completed a pre-workshop survey and n = 77 completed both a pre and post programme survey which are outlined below:

*Tiaki Whānau Tiaki Ora wānanga survey responses – knowledge of suicide prevention - ‘High’ response*

Tiaki Whānau Tiaki Ora wānanga survey responses (2022) – knowledge of suicide prevention	Pre wānanga ‘High’ responses (n=90)		Post wānanga ‘High’ responses (n=77)	
	N.	%	N.	%
Knowledge about myths and facts concerning suicide prevention	11	12%	56	72%
Familiarity with the warning signs of suicide	15	16.6%	40	52%
Confidence having a kōrero to whānau about suicide prevention	30	33.3%	54	70%
Confidence talking to whānau when they are wanting to take their life	27	30%	48	62.3%
Feeling positive about encouraging whānau to get the help they need	44	49%	63	81.8%
Awareness about knowing who to talk to if they need help to support their whānau member	30	33.3%	54	70%
Awareness of information about local and regional resources	10	11%	38	49.4%
Overall level of understanding about suicide and suicide prevention	14	15.6%	48	62.3%

Te Rau Ora surveyed Whānau champions from 2018-2021 against 18 statements.

Whānau champion survey response to rating statements about Tiaki Whānau Tiaki Ora programme (2018-2021)	Strongly Agree (n=47)		Strongly Agree and Agree (n=47)	
	N.	%	N.	%
Clarity and relevance of the aims of the programme	38	80.9%	45	95.7%
Helpful and easy to use were the Tiaki Whānau Tiaki Ora programme guidelines	32	68%	43	91.5%
Recommend the programme to others	42	89.4%	45	95.7%
Ease of using the Toolkit	38	80.9%	47	100%
Confidence to share resources with others	35	74.5%	45	95.7%
Usefulness of the ‘Tū Whānau Mai’ booklet	40	85.1%	47	100%
Usefulness of the ‘See You Tomorrow Eh!’ booklet	40	85.1%	47	100%
Usefulness of the USB resource	23	48.9%	32	68%
Ease of communication with the Tiaki Whānau Tiaki Ora team	38	80.9%	46	97.9%
Well supported in whānau champion role	35	74.5%	44	93.6%
How positive was receiving koha as part of the programme	35	74.5%	46	97.9%
Attend the programme again	39	83%	45	95.7%
Confident talking about suicide prevention among whānau	34	72.3%	47	100%

Confident talking about suicide prevention with others	35	74.5%	47	100%
Confident discussing the risk factors to suicide among whānau	36	76.6%	47	100%
Confident discussing the risk factors to suicide with others	35	74.5%	47	100%
Confident talking about wellbeing among whānau	36	76.6%	47	100%
Confident talking about wellbeing with others	36	76.6%	47	100%