Appendix 1

Evidence review youth suicide prevention (2016)

To identify relevant peer-reviewed literature, key academic databases were searched using terms such as suicid* AND universal OR selective OR indicated OR teen* OR adolesc*. English language studies published from 1990 onwards were eligible for inclusion in the review. Studies were included if they implemented an intervention aimed at preventing or treating suicidal behaviour in young people up to the age of 25 years, and included a suicide-related outcome.

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Evidence base for youth suicide prevention and technology

Table 1. Online interventions (n = 7)

Study	Setting and country	Intervention category	Intervention description	Participants	Suicide-related findings	Level of evidence
Haas et al., 2008	University, USA	Multimodal (includes screening, online counselling and assessment)	Screening questionnaire followed by interactive, web-based outreach method. Includes optional online counselling and accessing a personalised assessment online.	1,162 students determined to be at-risk for suicidal behaviour through screening.	1 suicide during 4-year period of intervention, compared with 3 suicides during 4 years prior.	III-3
Hooven et al., 2012	Schools, USA	Multimodal (assessment, counselling, skills training)	*Promoting CARE program:* C-CARE - 1.5-2hr assessment interview followed by a brief counselling protocol and the facilitation of social connections with parents and school staff. P-CARE - parents complete two 2-hour home visits. Both conditions - booster session 2.5 months post intervention.	615 high school students in year 9-12 who were screened as being at risk for suicide (mean age = 15).	C-CARE and combine C-CARE and P-CARE produced significantly greater reductions in suicide risk factors (ideation, threats).	II
Hooven et al., 2010 *Long term follow-up of Hooven et al., 2012.*	Schools, USA	Multimodal (assessment, counselling, skills training)	*Promoting CARE program:* as above (C-CARE and P-CARE).	593 high school students in year 9-12 who were screened as being at risk for suicide (mean age = 15.9).	All observed risk trajectories indicated a continued pattern of decreasing risk over the transition to young adulthood. P&C-CARE component showed greater reductions in suicidal ideation & threats than the other components. P-CARE alone was not significantly different from minimal intervention condition.	II

Study	Setting and country	Intervention category	Intervention description	Participants	Suicide-related findings	Level of evidence
King et al., 2015	University, USA	Multimodal (includes assessment and counselling)	Electronic Bridge to Mental Health Services (eBridge): online intervention including personalized feedback and optional online counselling delivered in accordance with motivational interviewing principles.	76 college students at a large public university who screened positive for suicide risk (mean age = 22.9).	Students assigned to eBridge reported significantly higher readiness for help-seeking scores, especially readiness to talk to family, talk to friends, and see a mental health professional. Students assigned to eBridge also reported lower stigma levels and were more likely to link to mental health treatment.	II
Robinson et al., 2014	Secondary schools, Australia	Psychological (CBT)	Re-Frame IT: eight online modules based on CBT, each of which takes around 15–20 minutes to complete. One module completed per week. Participants were able to access the modules again in their own time once they had been completed with the researcher. There was no social networking function.	21 students referred by the school wellbeing team after disclosing suicidal ideation (mean age = 15.6).	Overall levels of suicidal ideation decreased significantly over the course of the study.	IV
Taylor-Rodgers & Batterham 2014	University, Australia	Psychoeducation	3 week online psychoeducational intervention for depression, anxiety and suicide stigma. Participants randomly allocated to 1) online psychoeducation on depression, anxiety and suicide; or 2) control group with online attention-matched information with content unrelated to mental health.	67 young adults recruited through advertising at the Australian National University. Eligible if they met age criteria 18–25.	No significant effects for depression or suicide literacy. No significant differences in suicide stigma at post-test between control and experimental conditions. Significant between-group interactions were reported from pre-post for increased help-seeking attitudes/intentions for the experimental group.	II
Thompson et al., 2001 Secondary publication: Randell, et al. 2001	Schools, USA	Multimodal (assessment, counselling, skills training)	*Promoting CARE program.* C-CARE: as above CAST: 12 sessions over 6 weeks (total 12 hours) small group skills-training program combined with C-CAST.	460 potential high school drop outs defined as 'high risk' from 7 schools aged 14-19 years.	Intervention conditions showed significantly different rates of decline in attitude towards suicide and suicidal ideation compared with controls. These reductions were consistent through to follow up.	II

Evidence base for youth suicide prevention in education settings

Table 2. School- and university-based education programs and awareness training (n = 18)

Study	Setting and country	Intervention description	Participants	Suicide-related findings	Level of evidence
Ciffone 1993	Secondary schools, USA	*Larkin High School in Elgin, suicide prevention program.* 1. Written material distributed on the warning signs of suicide and basic intervention strategies. 2. Students shown a 15 minute video that depicts adolescents who are feeling lonely and need to 'belong' → one adolescent completes suicide and one who attempts suicide. 3. Discussion about mental health, coping strategies, the 'manipulative and unheroic act of poor judgement', and appropriate/inappropriate peer responses to a distressed friend. 4. 40 minute structured discussion to reinforce healthy messages and dispel erroneous messages. 5. Positive self-esteem checklist is distributed at the end of the session to restore feelings of positive self-esteem.	324 sophomore students from 3 suburban high schools.	At baseline, 74% of all students did not believe that young people who kill themselves are usually mentally ill, however a significant number switched to a desirable response 30 days later. Belief that suicide is a possible solution for people with a lot problems was held by 17% of adolescents at baseline. Post-test only 14 students switched to a desirable response. 92% intervention & 67% of control group would talk to a friend if they had suicidal thoughts; maintained this response 30 days later. 54% of intervention & 25% control students who initially answered no switched to a yes response at follow up. 97% of intervention students would seek a mental health professional if they felt very upset and maintained this response. 60% of intervention and 20% of control who said no at baseline switched to yes at follow up (however no significant difference between the groups).	III-2
Ciffone 2007	Secondary schools, USA	*South Elgin High School (SEHS) Suicide Prevention Program.* A 3-day curriculum delivered as part of the health class. Day 1: 50 minute presentation from social workers; included a short video, structured discussion and a presentation of 13 transparencies. Day 2: 26 minute video titled "Day for night; recognising teenage depression"; distribution of written information and a 20-question quiz. Day 3: Teachers reviewed answers from the quiz and encouraged discussion.	421 10th-grade students.	Attitudes to suicide were significantly improved within the intervention group. Participants who associated suicide with mental illness showed increases in help seeking behaviour. 86% would talk to a friend if they were experiencing suicidal thoughts (more than at baseline). 78% would talk to a mental health professional about suicidal thoughts (more than at baseline).	III-1

Study	Setting and country	Intervention description	Participants	Suicide-related findings	Level of evidence
Cigularov et al., 2008	Secondary schools, USA	*Raising Awareness of Personal Power (RAPP).* 50-70 minute curriculum-based program, delivered as part of the schools' health class curriculum. Provides information on depression and bipolar disorder, suicidal warning signs and a 3-step process of how to respond (Listen, Ask, Take Action), and relevant resources available. There is the opportunity for young people to refer themselves for help, and at the end of the session students are given resources including a card with suicide hotline numbers on it and instructions on how to help someone in crisis.	779 high school students (mean age = 15.2 years).	Significant improvement in knowledge about suicide, attitude towards suicide, and self-efficacy for suicide prevention in both intervention and control group.	II
Eggert et al., 1995	High school, USA	Personal Growth Class (PCG): Students had the option of taking either a 1-semester class, PGC I (5 months or 90 class days in length) or PGC II (10 months or 180 class days) , both of which were delivered as one of their five or six regularly scheduled classes. Components of both included: (1) a small-group work component characterized by social support and help exchanged in group leader-to-student and peer-to-peer relationships; (2) weekly monitoring of activities targeting changes in mood management, school performance and attendance, and drug involvement; and (3) life skills training in self-esteem enhancement, decision making, personal control (skills training in anger, depression, and stress management), and interpersonal communication.	High school students from grades 9-12 in urban high schools, who were at risk of suicide, OR "typical" students -defined as not at-risk for school failure.	Significant decline in suicide risk behaviours and suicidal ideation over time for all three groups, but no differences between groups. The program appeared least effective in reducing suicide-risk and related-risk factors for youth in the 2-semester Personal Growth Class.	III-1

Study	Setting and country	Intervention description	Participants	Suicide-related findings	Level of evidence
Gravesteijn et al., 2011	Secondary schools, Netherlands	*Skills for Life Programme for Adolescents.* 14 weekly classes (approximately 1hr in length) designed to enhance positive thinking, social skills and emotional skills in conflict situations. Focuses on enhancement of positive behaviours and prevention of problem behaviours. Skills taught by instruction, modelling, behavioural rehearsal, feedback, social reinforcement and extended practice in the form of behavioural agreements.	958 high school students aged 13-17 (mean age = 14.4).	Significant decrease in suicidality (suicide attempt + suicidal ideation) following the program, however no significant effects on suicidality in the long term. 14.1% - 18.6% with suicidal ideation over the past 6 months; 5.3% - 10.2% attempted suicide in last 6 months.	III-2
Kalafat & Elias 1994	Secondary schools, USA	Three 40-45 minute lessons delivered by teachers with experience in delivering suicide awareness programs in the past. Lesson 1: information about suicide, attitudes towards suicide, and tunnel thinking experienced as a result of stress. Lesson 2: suicide warning signs, and an exercise that included an encounter with a suicidal peer, and modelling of seeking adult help. Lesson 3: video that emphasized the consequences of failing to respond to a suicidal peer and a review of school based resources. A wallet card with local crisis phone numbers was also provided.	235 10th grade students from two suburban middle class schools.	Intervention group had significantly higher knowledge scores at post-test. Intervention group were more likely to disagree with a cluster of items that consisted of negative statements about seeking help and intervening with suicidal individuals, and less likely to agree that talking about suicide in class may stop some kids from killing themselves. Intervention group were more likely to tell another friend what they noticed about their friend. Non-significant trend towards the intervention group to ask their friend if something was bothering them and to tell a trusted adult. Intervention group were more likely to tell their friend to call a hotline, more likely to get advice from another friend, and less likely to tell their friend to call a mental health centre.	III-1

Study	Setting and country	Intervention description	Participants	Suicide-related findings	Level of evidence
Kalafat & Gagliano 1996	Secondary schools, USA	5 small group discussion classes that covered: effective coping techniques; an explanation of mental health counselling and the aim of reducing stigma, helping students to identify helpful adults in school; a review of suicide myths and facts and the role of peers in identifying and assisting young people in crisis. Before classes students were presented with 2 vignettes; one represented a 'low ambiguity' suicide risk situation and the other a 'high ambiguity' suicide risk situation.	109 eighth-grade students from a suburban middle class school.	Low ambiguity vignette: There was a significant difference between groups. Of the intervention students, 40.4% would tell an adult (control=1.8%); 40.4% would talk to their peer (control=77.2%); 19.2% would do nothing (control=21.1%). High ambiguity vignette: There was a significant difference between groups. Of intervention students; 28.8% would tell an adult (control=0%); 51.9% would talk to their peer (control=92.9%); 19.2% would do nothing (control=7.1%).	III-2
King, Strunk et al., 2011 Secondary pub = Strunk et al., 2014	Secondary schools, USA	*Surviving the Teens® Suicide Prevention and Depression Awareness Program*. 4 x 50 minute sessions consisting of information on risk factors for depression/suicide and suicide warning signs with a focus on how to recognise these in oneself and others, common myths associated with suicide, coping strategies for stressors, and how to access referral sources. The program is taught using real life stories of teens experiencing depression/suicide, a crisis intervention card to access referral sources and access to the program website. Also teaches students positive ways to increase self-esteem, manage anger, communicate with their parents and resolve family conflicts to increase family connectedness.	1030 9th-12th grade students (mean age = 14.1). Post-test n = 919 Follow up n = 416	Students' self-efficacy significantly increased with regards to recognizing a suicidal friend, knowing what to do, asking a friend if they are thinking about suicide, helping them see a counsellor. At post-test, students were more likely to tell an adult if they or their friend was suicidal, would try and help a suicidal friend to see a counsellor or adult. Fewer people at post-test said that if they were depressed or suicidal they would not go to see a counsellor. At 3 month follow up there was only a sustained increase in students who would tell an adult if they or their friend were suicidal. There were statistically significant differences between pre-and 3 month post-test on the number of students with suicidal ideation, making a suicide plan and attempting suicide.	IV

Study	Setting and country	Intervention description	Participants	Suicide-related findings	Level of evidence
Klingman & Hochdorf 1993	Secondary schools, Israel	12 weekly group sessions of 50 minutes each, delivered by school counsellors or psychologists. Topics taught include; adolescents and distress, learned helplessness, hopelessness and depression, self-destructive behaviour and youth suicide, self-efficacy and self-control, learned resourcefulness, empathy training, help seeking behaviour and peer support, stress inoculation, and prevention.	237 grade 8 students (age range = 12.5–13.5 years).	Participants in the intervention group showed a significant improvement in knowledge of youth suicide and help resources at post-test. Males showed a greater reduction in risk of suicide compared with females, and there was a significantly greater reduction in the intervention group compared with the control group.	III-1
LaFromboise & Howard-Pitney 1995	Secondary schools, USA	*The Zuni Life skills Development Curriculum.* Curriculum delivered 3 times per week over 30 weeks, comprising 7 units: 1) building self-esteem; 2) identifying emotions & stress; 3) increasing communication & problem solving skills; 4) recognising problematic thinking & behaviour; 5) receipt of suicide information; 6) receipt of suicide intervention training; 7)setting personal and community goals.	128 junior high students (mean = 15.9).	The intervention group were less suicidal than the control. No differences in suicide self-efficacy. Greater suicide intervention skills in the intervention group. Authors describe a 'marginally sig result' for problem solving but didn't reach .05. All students demonstrated higher levels of problem solving skills in the more mild suicide scenario than the more serious scenario.	III-2
Le & Gobert 2015	Secondary schools, USA	Mindfulness class offered as an elective class at a Native American school - four 55m sessions per week over 10 weeks. The class was facilitated by at least two facilitators and had a maximum of 10 students. Sessions covered mindfulness practice, story, metaphor, experiential activity, discussion. Began and ended with a check-out and prayer. Students given weekly homework assignments.	8 Native American youth (mean = 17 years).	At pre-test, 44% reported having thoughts that they were better off dead or of hurting themselves in some way on several days to more than half the days. Post-test, 100% responded not at all to this item.	IV

Study	Setting and country	Intervention description	Participants	Suicide-related findings	Level of evidence
McArt et al 1999	Secondary schools, USA	*Youth Emergency Services (YES).* Educational workshop for adolescents on depression and suicide, with inclusion of help-seeking strategies with the aim of promoting an increase in access to mental health services. The program format included a discussion, video, slides, a survey and evaluation. Workshop training took place with staff and community members around how to identify those at risk. Workshops further educated students and parents about suicide, risk factors and interventions and discussed referral options and crisis services.	Adolescents in high school, parents, and adults who work with adolescents.	Students reported an increase in knowledge around suicide following conclusion of the workshop. However, the author's indicated that numerous students had prior knowledge around mental health prior to attending. Additionally, students reported a change in opinion regarding suicide myths.	IV
Portzky & van Heeringen 2006	Secondary schools, Belgium	2-hour educational intervention comprising psycho-education and peer helping. The psycho-education component includes an in-depth description of the suicidal process with the implication that this provides an opportunity to intervene and help. The 2nd part of the program describes risk factors for suicide. The final part focuses on peer helping, identification of warning signs and teaching how to respond to these signs. Strong emphasis was placed on coping skills & active listening when faced with a suicidal person. Also included info about school and community-based resources for help.	172 secondary school students (mean age = 15.6).	The experimental group demonstrated significantly higher knowledge compared to the control group post-test.	II
Schaffer et al., 1990	Secondary schools, USA	2 different prevention programs (first 1.5 hours, second 3 hours). Both administered by trained classroom teachers. Goals were raising awareness, increasing knowledge, providing both behavioural and informative advice about how to refer adolescents, and encouraging at-risk adolescents to seek help.	973 9th-grade students (mean age = 14.4).	No significant program effects (knowledge and attitudes) found between exposed and control students, although direction changed as expected. Post-test, students who had attempted suicide were less likely to think that other students should participate in the program and more likely to think that talking about suicide would increase the risk of suicide attempts than those who had not attempted.	III-2

Study	Setting and country	Intervention description	Participants	Suicide-related findings	Level of evidence
Silbert & Berry 1991	Secondary schools, USA	*Suicide Prevention Unit.* Lesson 1 and 2 - 2 50 minute class sessions. Lesson 1 - common ideas and misconceptions about suicide, how to cope with depression, how to help a friend. Lesson 2 - how to identify suicidal feelings and warning signs in others, how to talk to friends and ask them to seek help, what sources of help were available in the community, and importance of seeking adult help.	323 10th grade students (median age = 15).	Both experimental groups showed an increase in knowledge from pre-test to post-test, slight decrease in knowledge at follow-up. No increases in knowledge in control group.	III-2
Strunk et al., 2014	Secondary schools, USA	*Surviving the Teens® Suicide Prevention and Depression Awareness Program,* as above.	1547 students in grade 9-12 (age range = 13-18).	Program group participants demonstrated significantly greater improvements than control group participants in confidence in helping a suicidal friend, perceived importance of knowing suicidal warning signs and steps to take with suicidal friends, intention to help self or friends, stigma, and knowledge of suicide risk factors, warning signs, myths and facts.	III-2
Walker et al., 2009	Secondary schools, USA	*LifeSavers.* 3-day training retreat. Teaches youth to engage in teamwork and listen to others without judgement in addition to recognising the signs for youth who may be at risk for suicide. Trainees identified by school counsellors & Lifesavers staff.	63 students (mean age = 15.05).	Significant increase in knowledge and positive attitudes towards suicide prevention.	IV

Study	Setting and country	Intervention description	Participants	Suicide-related findings	Level of evidence
Wilcox et al., 2008	Primary schools, USA	1) *The Good Behaviour Game (GBG):* classroom team-based behaviour management strategy that promotes good behaviour by rewarding teams that do not exceed maladaptive behaviour standards as set by the teacher. The goal is to create an integrated classroom social system that is supportive of all children being able to learn with little aggressive, disruptive behaviour. 2) *Mastery Learning (ML*): teaching strategy with demonstrated effectiveness in improving achievement. The underlying theory and research posit that under appropriate instructional conditions virtually all students can learn most of what they are taught. ML was directed at learning to read.	1918 youths who started first grade in 41 classrooms in 19 elementary schools during 1985–1986.	First graders assigned to GBG classrooms experienced subsequent lower incidence of suicidality through childhood, adolescence, and into young adulthood compared to internal GBG controls. They reported half the lifetime rates of ideation and attempts compared to their matched controls. For ideation, the beneficial GBG effect was consistent regardless of whether baseline covariates were included. The GBG effect on attempts was less definitive once gender and baseline depressive symptoms controlled for. No statistically significant impact of ML.	II

Table 3. School- and university-based gatekeeper training (n = 26)

Study	Setting and country	Intervention description	Participants	Suicide-related findings	Level of evidence
Biddle et al., 2014	Secondary schools, USA	*Student Assistance Program (SAP):* implemented by a professionally trained core team that may include nurses and nurse practitioners, counsellors, teachers, an administrator, a school district representative, and liaisons from county mental health and drug and alcohol systems. Team members identify student psychosocial problems, determine if they are within school responsibility, and suggest interventions. When a problem is beyond the array of services provided at school, teams assist in accessing services within the community.	18,445 high school students in 9th – 12th grade referred to the SAP for suicidal ideation, gesture, or attempt.	No subjects in the study died by suicide (but 42 non-participants did).	IV
Cimini et al., 2014	University, USA	Training program provides campus-level prevalence data on suicide and suicide risk, involves students in addressing situations that may occur to individuals in their specific roles on campus through behavioural rehearsal and discussion, offers listings of relevant on-campus and off-campus referral resources. At the end of the training session, participants were given a laminated handout outlining key program elements.	277 faculty and staff members and 68 students from a large public university (51% female).	Statistically significant increase in knowledge and comfort upon completion of training for both faculty/ staff and student groups, although degradation of training effects at 3-month follow-up was evident. Training effects at 3-month follow up were above baseline for comfort and below baseline for knowledge.	IV
Condron et al., 2015	USA	Garrett Lee Smith Memorial Suicide Prevention Program (GLS) – school gatekeeper training component.	1084 school-based training participants who attend a training event sponsored by the GLS State/ Tribal Program (mean age = 41).	Time spent interacting with youths was positively correlated with the number of gatekeeper identifications and knowledge about service receipt. Gatekeepers who participated in longer trainings identified proportionately more at-risk youths than participants in shorter trainings. Most gatekeeper trainees referred the identified youths to services regardless of training type.	IV

Study	Setting and country	Intervention description	Participants	Suicide-related findings	Level of evidence
Cross et al., 2011	Schools, USA	*Question, Persuade, Refer [QPR]:* 90-minute presentation that included national and campus-specific statistics on college student suicide, myths and facts about suicide, risk and protective factors, warning signs, information about campus and local mental health resources, and strategies used to question, persuade, and refer at-risk students to the appropriate services. 2 conditions: Training as usual (TAU) and training plus behavioural rehearsal (T+BR: normal training condition plus an additional small group practice opportunity after the large group presentation (role play)).	81 school staff and 56 parents (mean age = 42).	Knowledge and attitudes improved from pre to post and were maintained at follow-up for both training condition groups. No differences in knowledge and attitude outcomes between TAU and T+BR. No differences between parents and staff. T+BR group performed better in role plays. Positive impact of practice persisted over time, but both conditions showed significant decrements at follow-up. No difference between groups in self-reported referrals at follow-up.	II
Davidson & Range 1999	Schools, USA	1-hour module including information about 20 suicide warning signs, other background information about suicide, specific suggestions for teachers, and specific mental health resources in the local community.	75 practice teachers (final semester at university, teaching full time).	Answers were significantly higher at post-test, indicating an increased willingness to view the suicide threat seriously and take specific actions to prevent it. True for all items.	IV
Fendrich et al., 2000	Schools, USA	CD Rom, titled *"Team up to save lives: What your school should know about preventing youth suicide"*: designed to educate school staff about suicide risk factors, warning signs, responding to a crisis and reducing access to means. It was mailed to every high school, K through 12 combined school and junior high school across the USA. It came with instructions on how to use it, and to direct it to school personnel who were most likely to serve as crisis counsellors.	79 representatives from schools in Chicago.	30% of respondents endorsed the CD as "very useful". 40% of full-survey respondents indicated they were able to make use of the program - using the information to educate other faculty, to counsel students, to address needs of parents, to evaluate crisis preparedness, to form crisis teams in the school, and to cope with aftermath of a sudden violent loss in the school.	IV

Study	Setting and country	Intervention description	Participants	Suicide-related findings	Level of evidence
Hashimoto et al., 2016	University, Japan	Gatekeeper-training program based on Mental Health First Aid (MHFA). 2.5-h course with 3 parts. First 30 min - lecture about factual information of depression and suicide in Japan, with specific topics on suicidal students. Next 2h - Provided a didactic lecture about basic gatekeeper skills based on the MHFA program, then presented a video that demonstrated good and bad gatekeeper behaviour, and had small group role-plays along with the scenario of the video. Participants spent most of the program time practicing actual gatekeeper skills.	76 administrative staff of Hokkaido University.	Significant improvement in competence in the management of suicidal students. Also improvements in confidence in management of suicidal students and behavioural intention as a gatekeeper after training, though questionnaires for those secondary outcomes were not validated. These improvements continued for a month.	IV
Johnson & Parsons 2012	Schools, USA	*Question, Persuade and Refer* (QPR; as above).	36 school staff from two schools in the same district.	Increase in knowledge about suicide. One staff member implemented the QPR protocol in managing a potentially suicidal student. The remaining 35 staff members had not implemented the QPR program due to the belief that they had not encountered a student whom they believed was suicidal. There were no identified suicide attempts during this timeframe.	IV
Kataoka et al., 2007	Schools, USA	*LAUSD Youth Suicide Prevention Program (YSPP).* YSPP is a district-wide suicide prevention policy that requires staff to use the program criteria to identify students at risk of suicide. Students are then referred for an assessment with a staff member trained in crisis response. A standardised contact and assessment form is submitted to the district and parents are contacted.	95 parents of students identified as at risk of suicide by staff trained in YSPP.	21% of parents reported that their child had attempted suicide in the past year. 98% of parents contacted following their child being identified as at risk of suicide. 72% of children were provided with referrals for mental health services; 92% received mental health services.	III-2

Study	Setting and country	Intervention description	Participants	Suicide-related findings	Level of evidence
King & Smith 2000	Schools, USA	*Suicide, Options, Awareness and Relief (Project SOAR):* an intensive suicide prevention training package for school counsellors. It covers how to appropriately conduct suicide risk assessments, how to coordinate suicide prevention efforts in their local building and the steps to initiate if a young person makes a threat. It also helps counsellors develop active listening skills, increase knowledge about crisis theory and examine personal attitudes towards suicide, identify students at risk, assess the severity of risk, counsel students and refer students on to external mental health agencies.	186 school counsellors working in the Dallas Independent School District who had completed SOAR training.	Counsellors who had received SOAR training in the past 3 years were significantly more knowledgeable than those who had not. They also felt significantly more confident in offering support to suicidal young people, assessing suicide risk, counselling, and using the crisis intervention counselling model compared with those who had not received training in the past 3 years.	III-2
Klingman 1990 (1)	Schools, Israel	*Group orientated workshop (GO) & Problem-orientated workshop (PO)*: both aimed at increasing general knowledge, enhancing identification of warning signs and promoting comfort in talking about adolescent distress and suicide in schools. GO focussed on creating a group environment in which the teachers experience themselves as they learn. PO more structured, persuasive in nature and didactic.	30 female junior high teachers.	No indication of differential effects of the two workshops.	III-1
Klingman 1990 (2)	Schools, Israel	Brief workshop whereby school counsellors analyse hypothetical statements by suicidal clients and written vignettes, and practice role play.	15 female school counsellors.	Participants scored significantly higher on the Suicide Intervention Response Inventory (SIRI) two weeks after the intervention, indicating higher competence.	IV
Mitchell et al., 2013	University, USA	*Question, Persuade and Refer* (QPR; as above).	911 campus community members from a large public university who were trained in QPR from December 2006 to August 2009.	Results indicated: (a) increases in suicide prevention knowledge, attitudes, and skills at post-test and follow-up on 8 items (warning signs, how to ask about suicide, influencing help-seeking, how to get help, knowledge of local resources, talking about resources, accompanying person to get help, and calling a crisis line); and (b) short-term increases on suicide prevention facts and appropriateness of asking about suicide.	IV

Study	Setting and country	Intervention description	Participants	Suicide-related findings	Level of evidence
Pasco et al., 2012	University, USA	*Campus Connect training:* Participants are provided information regarding prevalence of college student suicide, warning signs, strategies for asking students if they are thinking about suicide, and strategies for making referrals to appropriate resources. All Campus Connect trainings conclude with a role play. Participants assigned to either Campus Connect in its standard 3-hour format, or a 1.5-hour adapted format of Campus Connect, in which all experiential exercises and role plays were removed from the training and only the didactic informational material was presented.	65 student resident advisors (mean age = 19).	3-hour experiential training: Significant improvement in crisis response skills and self-efficacy. 1.5 hour didactic training: no improvement in self-efficacy items that assessed comfort in communication and relationship-building skills. The skill improvement achieved was significantly less for RAs in didactic condition than experiential condition.	IV
Pearce et al., 2003	University, Australia	*Suicide Intervention Project (SIP):* Participants in the SIP are trained to recognise mental health problems in others, feel comfortable talking to other students about mental health issues, and have knowledge of mental health support services available to students. Includes several components: ASIST training, several short presentations, and information packs.	42 university students recruited through advertisements (mean age = 24.2).	The SIP had a positive effect on participants, with almost all measures changing from pre- to post-test in the expected directions. None of these factors correlated with the actual behaviour of talking to other students about feelings, which was measured two weeks after program completion. At follow-up, students reported increases in talking to other students about their mental health feelings in the two weeks after completion of the SIP.	IV
Reis & Cornell 2008	Schools, USA	*Question, Persuade and Refer* (QPR; as above).	Intervention group (n = 238): teachers or counsellors who had received QPR training within the past 22 months. Control (n = 172): staff who had not received any training.	QPR increased trainee's knowledge of suicide compared with controls. 85% of trainees said that their knowledge had increased. 74% of QPR trained participants said the course increased their confidence in dealing with potentially suicidal students. QPR training increased levels of prevention practice compared with controls. Trainees made more no-harm contracts than controls. Trainees made fewer referrals than controls.	III-3

Study	Setting and country	Intervention description	Participants	Suicide-related findings	Level of evidence
Robinson et al., 2008	Schools, Australia	*Managing self-harm in young people*: A 1 or 2-day training package including: Day 1: 1) epidemiology of self-harm and suicidal behaviour & current evidence regarding interventions in schools; 2) exploration of attitudes to self-harm; 3) recognition and assessment of risk; 4) risk management planning; 5) working with families. Day 2: 1) evidence on therapeutic interventions; 2) signs/symptoms of mental disorders; 3) therapeutic techniques when working with young people; 4) policies and procedures in schools; 5) working with specialist services.	213 school staff (mean age = 42.5).	Overall no significant effect on participants' attitudes to suicide was demonstrated, except on 2 items: 'working with suicidal patients is rewarding' and 'I don't feel comfortable assessing someone for suicide risk'.	IV
Stanley et al., 2015	University, USA	90-minute didactic session on adolescent depression screening and suicide prevention + supervised experience in depression screening and suicide prevention skills throughout their rotation.	38 residents on their Adolescent Medicine rotation.	Residents' responses indicated an increase in knowledge and comfort in assessing and managing suicidal ideation.	IV
Stuart et al., 2003	Schools, Canada	*Peer Gatekeeper Training (PGT) Program:* 2 half-day sessions, approximately 1 week apart, with a follow-up session 3 months later. The skill-based training sessions included a variety of training techniques covering: active listening skills; self-care and setting limits; crisis theory; signals of suicide; suicide risk assessment; role-play scenarios involving suicidal youth; and community resources.	65 adolescents (from 5 schools). 80% of peer helpers were in their first year of a peer-helping program (mean age = 15.6).	Compared with pre-test, knowledge scores were significantly higher at post-test and maintained at 3-month follow-up. Compared with pre-test, attitudes toward suicide intervention improved immediately after training and at decreased slightly at follow-up. Students were more capable of inquiring about suicide ideation after they had completed the PGT program. Skill level increased and was maintained over time.	IV

Study	Setting and country	Intervention description	Participants	Suicide-related findings	Level of evidence
Suldo et al., 2010	Schools, USA	4-hour workshop: included a summary of current research & then employed active learning procedures to facilitate the implementation of procedures contained within a manual. This included assessment; intervention; collaborating with community agencies, parents and teachers; postvention; consideration of diversity and legal and ethical issues. Learning material included vignettes of actual scenarios encountered by the university research team in responding to referrals for suicide assessment.	121 school psychologists.	Improved knowledge of suicide prevention, intervention & postvention, intervention knowledge scores maintained at follow up. Improved confidence in all activities assessed including assessment, referral to community agencies, counselling and postvention; maintained at follow-up. Increased confidence in preparation to work in a suicide-prevention capacity with culturally diverse youth, youth with disabilities, diverse sexual orientation and religious affiliations; maintained at follow-up.	IV
Taub et al., 2013	University, USA	2-hour training for RAs prior to beginning their work for the academic year that included significant experiential elements. The training included information about college student suicide, suicide warning signs, campuses resources, and how to respond to individuals in crisis. Also included opportunities to practice paraphrasing thoughts and feelings and understanding the experience of crisis. Included one or more role plays.	48 college residence advisers (RAs) → 30 new RAs and 18 returning RAs (mean age = 21.79).	New RAs showed significant improvement in their knowledge of suicide, knowledge of suicide warning signs, knowledge of places to refer, and crisis communications skills from pre-test to post-test. Returning RAs showed no significant increase in any of the areas - their pre-test scores indicate that they were already more knowledgeable and skilled than new RAs prior to the current round of training.	IV
Tompkins & Witt 2009	University, USA	*Question, Persuade and Refer* (QPR; as above).	240 college residence advisers (RAs; mean age = 20).	Although there were improvements in RA's appraisals of their preparation, efficacy, knowledge of resources, and intention to intervene with suicidal students, there were no significant gains in QPR Quiz Scores or QPR Behaviours; control group participants also showed gains in some domains (self-evaluation of knowledge, knowledge of resources, gatekeeper efficacy, and general self-efficacy) calling into question the impact of training vs raising awareness among a trained group of RAs.	III-1

Study	Setting and country	Intervention description	Participants	Suicide-related findings	Level of evidence
Tompkins et al., 2010	Schools, USA	*Question, Persuade and Refer* (QPR; as above).	106 school staff (mean age = 42.10 – intervention, 47.09 – control).	Compared with controls those trained showed a greater increase in knowledge of QPR and self-evaluation. For the trained group, there was a significant increase in the number of times each staff member reported asking about suicide. No effect of training on suicide identification or staff communication with students. Compared with controls those trained showed greater gatekeeper preparedness, perceived efficacy and access to services.	III-2
Walsh et al., 2013	Schools, USA	90 minute training, interactive didactic format and slide show. Content covered facts about youth suicide, risk factors, risk warning signs, basic suicide prevention steps.	237 school staff (aged 18-80 years).	Significant increase in knowledge of importance of prevention programs for students who exhibit suicide risk behaviour; significant increase in attitude, comfort and confidence in asking a young person about suicide; significant increase in staff likelihood of asking a young person about suicide.	IV
Wyman et al., 2008	Schools, USA	*Question, Persuade and Refer* (QPR; as above).	322 school staff (249 completed follow-up & analysed; mean age = 44.5).	Training increased self-reported knowledge, appraisals of efficacy, and service access. Training effects varied dramatically. Appraisals increased most for staff with lowest baseline appraisals, and suicide identification behaviours increased most for staff already communicating with students about suicide and distress. Increased knowledge and appraisals were not sufficient to increase suicide identification behaviours.	II
Yousuf et al., 2013	University, China	2-week intensive special studies module delivered to 3rd and 4th-year medical students. The module was elective and involved several modes of teaching. This course entailed 5 to 6 hours of attendance daily for a total of 10 days.	22 third and fourth-year medical students aged 20-23.	Positive trends were noted in attitudes towards suicide, namely: reduced negative appraisal of suicide, reduced stigmatisation of the phenomena, and increased sensitivity to suicide-related facts.	IV

Table 4. School- and university-based multimodal interventions (n = 12)

Study	Setting and country	Intervention description	Participants	Suicide-related findings	Level of evidence
Angerstein et al., 1991	Schools, USA	*Project SOAR (Suicide Options Awareness and Relief):* covers prevention, intervention, and postvention. Prevention = suicide awareness lessons for teachers and staff. Intervention = training school counsellors in all secondary and elementary schools in risk assessment of potential suicides through personal verbal interviews. A crisis team does postvention for students and teachers. There is also a peer support system and a section called Quest on esteem building. A committee of community mental health professionals advises the suicide and crisis management program.	150 building administrators and counsellors from two different school districts (one that offers the program and one that doesn't).	Significantly fewer counsellors in the district without projectSOAR knew about their district's procedures for handling suicide-related crises. Lack of knowledge about procedures correlated with fewer hours of training about suicide. Significantly larger number of SOAR trained counsellors believed that districts should provide suicide awareness training for parents. These counsellors were also significantly more aware of how and whom to call for assistance in a suicide-related incident. They were also aware of more students who had attempted suicide or had suicidal ideation in the past year than the non-trained district.	IV
Aseltine & DeMartino 2004	Secondary schools, USA	*Signs of Suicide (SOS) Suicide Prevention program:* Curricula to raise awareness of suicide and its related issues and a brief screen for depression and other risk factors associated with suicidal behaviour.	2100 high school students from 5 schools.	Intervention group: Knowledge of suicide was significantly higher; attitude towards suicide and suicidal individuals was significantly more favourable. No statistically significant increases in help-seeking behaviour. Also less likely to report a suicide attempt in the last 3 months compared with youths in the control group. No differences between groups on suicidal ideation.	III-1
Aseltine et al., 2007	Secondary schools, USA	*Signs of Suicide (SOS) Suicide Prevention program* (Curricula and screening).	4133 high school students from 9 schools.	Knowledge of suicide was significantly higher and attitude towards suicide and suicidal individuals was significantly more favourable in the intervention group compared with control group. No statistically significant increases in help-seeking behaviour. Students in the intervention group were 40% less likely to report a suicide attempt in the last 3 months compared with youths in the control group. Level of suicidal ideation did not differ between the groups.	II

Study	Setting and country	Intervention description	Participants	Suicide-related findings	Level of evidence
Freedenthal 2010	Schools, USA	*Yellow Ribbon Suicide Prevention Program:* Includes schoolwide assemblies, peer leadership training for students, staff training for adult gatekeepers such as high school teachers, community presentations, and local chapters that provide outreach and education. "Ask4Help" card is distributed, which contains suicide hotline numbers, instructions to youth to give the card to somebody who can help, and directions to potential helpers on how to proceed. The overriding messages of the Yellow Ribbon program are that youth should tell an adult if somebody they know is suicidal and seek help for themselves when necessary.	174 staff and at experimental and comparison schools (142 staff post-test). 146 students only at experimental school (mean age = 15.8yrs).	No significant changes in suicide related help-seeking. The proportion of students who reported having thought about or attempted suicide during the current school year increased slightly from 11.2% (n = 15) in the year before the intervention to 14.7% (n = 19) in the year of the intervention. This increase was not statistically significant.	IV
Muehlenhamp et al., 2009	University, USA	*AI suicide prevention program:* Gatekeeper trainings and workshops focusing on educating American Indian (AI) college students about suicide - model attempts to integrate connections between (a) AI students, campus departments and services, and tribal communities; (b) AI culture and spirituality; and (c) educational aspects designed to develop skills, strengthen relationships, and build resilience.	22 American Indian college students.	Significant improvements in suicide knowledge and problem-solving knowledge after training. At least two students who used the program for crisis intervention were referred by students who attended one of the trainings.	IV
Orbach & Bar-Joseph 1993	Schools, Israel	*Suicide Prevention Program:* consisted of two parts: student workshops and training of the staff. The student workshop consisted of 7 weekly 2 hr meetings.	393 high school juniors from six schools (5 normal high schools, 1 special education class).	Significant interaction between groups and time for suicidal tendencies across all schools. Significant differences between groups for pre and post-test suicidal tendencies found in five of the six schools with the intervention groups in schools A, B, C, & F showing a decrease in suicidal tendencies post intervention.	II

Study	Setting and country	Intervention description	Participants	Suicide-related findings	Level of evidence
Schilling et al., 2014	High military-impact schools, USA	*Signs of Suicide (SOS) Suicide Prevention program (as above).*	87 5th-8th grade students.	Significant increase in knowledge in SOS participants. Non-significant increase in favourable help-seeking attitudes. No significant effects of SOS on help-seeking behaviours. Students who reported pre-test suicidal ideation in the intervention group reported fewer suicidal behaviours (ideation, planning, and/or attempts) at post-test.	III-1
Schmidt et al., 2015	Rural school district comprising 9 schools, USA	*Yellow Ribbon Suicide Prevention Program* (as above).	5949 6th – 12th grade students.	11% had thoughts of hurting themselves within the past year or past few days (46% male). These students were assessed for risk and referred on to services where required. Increases in knowledge about: the program, suicidal ideation and help-seeking.	IV
Silverstone et al., 2015	Public schools, Canada	*Empowering a Multimodal Pathway Towards Healthy Youth (EMPATHY) Program:* All youth were screened for depression, suicidality, etc. Following screening there were rapid interventions (interview with students and family plus guided online CBT) for the students identified as being actively suicidal, as well as students who were felt to be at higher-risk of self-harm.	3244 6-12th grade students, aged 11-18.	Results from the 2,790 students who completed scales at both baseline and 12-week follow-up showed significant decreases in suicidality. There was a marked decrease in the number of students who were actively suicidal (from n=125 at baseline to n=30 at 12-weeks).	IV

Study	Setting and country	Intervention description	Participants	Suicide-related findings	Level of evidence
Wasserman et al., 2015	Schools from European Union Countries	*1) Question, Persuade, and Refer (QPR)* – for gatekeepers *(2) Youth Aware of Mental Health programme (YAM)* targeting pupils: aimed to raise mental health awareness about risk and protective factors associated with suicide, including knowledge about depression and anxiety, and to enhance the skills needed to deal with adverse life events, stress, and suicidal behaviours. *(3) Screening by professionals (ProfScreen):* pupils who screened at or above pre-established cut-off points were invited to participate in a professional mental health clinical assessment AND referred to clinical services, if needed.	11110 pupils from 168 schools in ten countries (Austria, Estonia, France, Germany, Hungary, Ireland, Italy, Romania, Slovenia, and Spain; median age = 15).	No significant differences between intervention groups and the control group were recorded at the 3-month follow-up. At the 12 month follow-up, YAM was associated with a significant reduction of incident suicide attempts and severe suicidal ideation, compared with the control group. 14 pupils (0·70%) reported incident suicide attempts at the 12 month follow-up in the YAM versus 34 (1·51%) in the control group, and 15 pupils (0·75%) reported incident severe suicidal ideation in the YAM group versus 31 (1·37%) in the control group. No participants completed suicide during the study period.	II
Wyman et al., 2010	Secondary schools, USA	*Sources of Strength Suicide program:* involves 3 phases: 1) school & community preparation - involved training 2-3 school staff to act as advisers and guide the peer leaders to conduct safe suicide prevention messaging; 2) peer leader training - 4 hours of interactive training following 15 modules; 3) school wide messaging via presentations, public service announcements, and video or text messages in social networking Internet sites.	453 high school students from 18 schools (mean age = 15.7 – intervention; 16.1 – control).	Each group showed decreases in suicidal ideation but no differences between groups. Peer leaders in the intervention group showed significantly greater expectations that adults at school could help suicidal peers, more rejection of codes of silence and decreased maladaptive coping strategies. Also more likely to seek help from adults; use SOS coping resources; and, identified more trusted adults. Students in the SOS schools showed improved perceptions of adult help for suicidal peers and improved norms for help-seeking from adults.	II

Study	Setting and country	Intervention description	Participants	Suicide-related findings	Level of evidence
Zenere & Lazarus 1997	Secondary schools in Miami, USA	*The Suicide Prevention and School Crisis Management Program (SPSCMP).* Common components of school interventions were: formal policy addressing student suicidal behaviour; procedures for assisting students at risk; creation of mental health crisis teams; prevention presentations for the school; dissemination of suicide prevention resource materials; on campus mental health personnel for risk assessments; training for staff around suicide topics; assessment tools for determining risk levels; listing of appropriate services; means for evaluating services.	Elementary, middle and senior school students attending 8 schools which received suicide prevention and intervention programs.	Since the introduction of the SPSCMP, there has been a dramatic decrease in the average number of annual student suicides, with a mean of 4.6 per year. There has further been a decline in suicide attempts from 243 in 1989-1990 to 95 in 1993-1994. No student who was identified as being suicidal by the DCM or who experienced an attempt completed suicide.	IV

Table 5. School- and university-based one-to-one interventions (n = 5)

Study	Setting and country	Intervention category	Intervention description	Participants	Suicide-related findings	Level of evidence
Eskin et al., 2008	Psychiatric departments at universities in Turkey	Problem solving	*Cognitive behavioural problem-solving therapy (PST):* 6 weeks with weekly scheduled sessions. Compared with wait-list control (WLC) condition.	53 high school students and university students who had a DSM-IV diagnosis of MDD (mean age = 19.1).	Post-treatment suicide risk scores of PST participants decreased significantly compared to the pre-treatment scores. No change in post-waiting and pre-waiting scores of WLCs.	II
Fitzpatrick et al., 2005	University, USA	Problem solving	35 minute video focused on problem-solving and coping styles.	110 nonclinical university students with active suicidal ideation (mean age = 19.02).	Both groups decreased in suicidal ideation over time, but the intervention group evidenced a more pronounced initial drop.	II
Joffe 2008	University, USA	Mandated assessment	*Suicide prevention program:* Core of the program is a policy that requires any student who threatens or attempts suicide to attend four sessions of professional assessment. The consequences for failing to comply with the program include withdrawal from the university.	Students at the University of Illinois (total population approx. 37,000).	The rate of suicide at locations within the country where the university is located have decreased by 45.3% from the 8 years prior to the program's start to the first 21 years of the program.	III
Nyer et al., 2015	University, USA	CBT	The 6-week CBT intervention was based on the Sequenced Treatment Alternatives to Relieve Depression (STAR*D) manual, which follows the approach developed by the cognitive therapy research group at the University of Pittsburgh (Shaw 1984).	9 university students with at least moderate depressive symptoms and/or suicidal ideation (mean age = 19.33).	There was a small reduction in suicidal ideation across different measures of suicidality from baseline to endpoint.	IV

Study	Setting and country	Intervention category	Intervention description	Participants	Suicide-related findings	Level of evidence
Tang et al., 2009	High schools, Taiwan	Problem solving	*The Program of Intensive Psychotherapy for depressed adolescents with suicidal risk (IPT-A-IN)*: Focus is on symptoms related to interpersonal problem domains, including interpersonal conflict, interpersonal sensitivity, role transition and grief. 2 sessions per week for 6 weeks.	73 high school students at risk for suicide (mean age = 15.25).	Intervention group had significantly lower suicidal ideation scores compared with the control group at post-intervention.	II

Table 6. School-based screening (n = 7)

Study	Setting and country	Screening tool	Participants	Outcome of screening
Brown & Grumet 2009	Secondary schools, USA	*The Columbia TeenScreen*: A 14-item Likert response questionnaire for young people aged between 11 and 18 years. **Criteria for a positive screen:** 1. endorsing 3 or more items as bad or very bad problem; 2. indicating wanting help with any symptoms; 3. any suicidal ideation or attempt within the past 3 months; 4. appearing distressed to the examiner; or 5. Asking to meet with someone to talk more.	229 Black or African American students (mean age = 14).	45% (n = 102) of those screened returned a positive result, 20% (n=45) endorsed current or previous suicidal ideation or attempt and 3% (n=6) required immediate hospitalization due to imminent risk of suicide. 57% endorsed some problem with depression and 77% with irritability. 62% of youth who returned a positive screen attended at least 1 appointment with a mental health services provider within 1 month of screening (linked) and 70% were linked by 6 months. Linkage rate for youth referred to school-based services was 86% compared with 41% for community-based agencies.
De Wilde et al., 2011	Secondary schools, Netherlands	*The Strengths and Difficulties Questionnaire (SDQ)*: 25 items, with five subscales: emotional symptoms, conduct problems, hyperactivity-inattention, peer problems, and prosocial behaviour. There was also two items specifically on suicide attempts and ideation. Only the emotional symptoms subscale was used in the analysis of the current study.	3692 first-grade secondary school students who had an interview with the school nurse, based on responses to health survey.	About 80% of student responses generated one or more 'attention subjects', however, the majority of these students were not considered 'at risk' by the nurse. More than 10% of students (n = 388) scored above cut-off on emotional symptoms subscale of SDQ. 4% reported suicidal thoughts and/or behaviour. 1.4% had both emotional problems and suicidal thoughts/behaviour. 17% of all interviews generated some action by the school nurse. Nurse took action for 31% of those reporting emotional problems, 36% of those who reported suicidal behaviour/thoughts, and 45% of those who reported both emotional problems and suicidal thoughts/behaviour. No action taken for more than half of the students reporting emotional problems.
Gould et al., 2009	Secondary schools, USA	*1) Beck Depression Inventory (BDI; A* 21-item inventory that screens for the behavioural, cognitive, affective and somatic components of depression) with an additional suicide question; 2) *Suicidal Ideation Questionnaire – Junior Version (SIQ-JR)*: a 15 item questionnaire for students in grades 7, 8 and 9; 3) suicide attempt history.	2342 high school students (mean = 14.8).	Intervention and control groups did not differ significantly on levels of distress immediately after the first POMS survey or 2 days later. Nor did they differ on SIQ scores after the survey or on interim suicidality scores between the first and second surveys. The authors conclude that there are no iatrogenic effects of asking about suicide as part of a screening intervention.

Study	Setting and country	Screening tool	Participants	Outcome of screening
Gould et al., 2005	Secondary schools, USA	*1) SIQ-JR; 2) The BDI.*	233 at-risk students and/or their parents who were screened in a school-based program 2 years previously.	During the initial screening process, 317/2342 young people were identified as at risk. 223 (70%) participated in the follow up. Of the 78 participants who received a referral to services at the initial screen, 76.9% said that the screening had influenced them in their decision to seek help. There were 54 'new service users' and of these, 7 students had help form an in-school provider, 25 from an outpatient provider, and 22 from multiple services. 44 students received psychotherapy alone, 6 received a combination of psychotherapy and medication, 3 received alternative treatment (e.g. acupuncture) and 1 student's treatment was unknown.
Gutierrez et al., 2004	Secondary schools, USA	1) The SIQ; 2) SIQ-JR 3) *Reynolds Adolescent Depression Scale (RADS):* 30 item questionnaire assessing symptoms associated with depression.	390 grade 9-12 students (mean age = 16.27)	11% (n = 44) identified as needing to be followed up; 3.1% were 'at risk/in crisis; 4.4% were of notable concern; 3.8% were in apparent need. Of the 44 students screened, 27% received intensive intervention, 39% received intermediate intervention, and 34% were monitored.
Hallfors et al., 2006	Secondary schools, USA	*The Suicide Risk Screen* (SRS; Thompson et al 1999): The SRS assesses factors found to predict suicidal behaviour (e.g. Suicidal ideation, depression and previous suicide attempt (s)).	930 "high risk" and 393 "typical" year 9-11 students.	29% of all students were rated as 'at risk'. High risk students were more likely than typical students to be rated as 'at risk' (34% vs. 21%). 9% of all students reported that they had attempted suicide within the past year. Of the 389 students rated as at risk, 120 (31%) did not complete a follow up interview.
Husky et al., 2011	Secondary schools, USA	*The Diagnostic Predictive Scales-8 (DPS-8):* The DPS-8 is a computerised self-report assessment designed to identify mental health difficulties, including questions on suicidal ideation, prior suicide attempts, social phobia, generalised anxiety disorder, OCD, depression, substance use, and the magnitude of impairment related to these syndromes.	4509 ninth-grade students from six public schools offered screening. 2488 consented and their records were reviewed.	400 youths screened positive on the DPS, an additional 89 screened negative but were deemed to be in need of clinical interview after the debriefing. 19.6% of screened adolescents were deemed to be at-risk and received a second-stage clinical interview. Of those identified as at-risk, 26.4% were currently receiving services for a mental health concern. Among adolescents who received any referral 76.3% received at least one follow-up visit, and 56.3% received minimally adequate treatment (3 or more sessions, or clinician termination of sessions).

Table 7. School-based postvention programs (n = 4)

Study	Setting and country	Intervention category	Intervention description	Participants	Suicide-related findings	Level of evidence
Carter & Brooks 1990	School and outpatient, USA	Group counselling	School based postvention service requested by school following a suicide. Initially addressed 20 students at the school to assess emotional needs, provide support, offer options for accessing therapeutic support, prevent further deaths and organise support plans. After two sessions, the six close friends of the deceased agreed to attend a weekly outpatient postvention group in a clinical setting, for 10 sessions.	6 students from an academically superior high school in the 10th and 12th grade who were bereaved by the suicide of a 16 year old male friend.	None of the six participants ended their life during the follow up period.	IV
Hazell 1991	Schools, Australia	Group counselling	Pilot program of intervention following student suicides, with a primary focus on preventing further suicidal behaviour. At the first school, the researchers met with senior staff members to discuss their approach and identify and recruit students who were the closest to the deceased. Then researchers conducted an 80 minute session with the students. The two remaining schools received similar interventions, however due to larger numbers, students were split into two groups, one led by the author and the other led by a psychiatric registrar.	Students bereaved by unrelated suicides at three different secondary schools in 1990.	Two students attempted suicide following the postvention sessions. Additionally, some students enrolled at participating schools who did not attend the sessions displayed suicidal ideation. Staff at the affected schools reported a perception that there had been an increase in distress within students, months after the completed suicides. There was a perception of increased help-seeking amongst students.	IV

Study	Setting and country	Intervention category	Intervention description	Participants	Suicide-related findings	Level of evidence
Hazell & Lewin 1993	Schools, Australia	Group counselling	The intervention commenced within 7 days of the death, and consisted of 90-minute postvention counselling conducted by a child psychiatrist or trainee psychiatrist. Sessions focused on psychoeducation, rumour control, student reactions and validation of emotions following the suicide. Help-seeking was also encouraged for those displaying suicidal ideation. Following the sessions, school staff were debriefed. A follow up with students was conducted eight months after the suicides.	806 adolescents at two different schools who were exposed to the death of a student by suicide.	Results from the Suicide Risk Index revealed that 40 participants from the counselled group had two or more risk factors for suicidal ideation or behaviour, which was similar to 231 uncounselled students. There were no significant differences between counselled students and uncounselled students.	III-2
Mackesy-Amiti et al., 1996	Schools, USA	Crisis response team	*Preparing for Crisis (PFC):* part of the Community Action for Youth Survival (CAYS) adolescent suicide prevention project. One 4 hour training session covering problems encountered in previous crisis situations, trainers experience with death and how that compares with the experiences of their students, developmental aspects of adolescent's grief reactions. Response team is developed according to established model.	205 school personnel and community representatives.	Overall, there was a statistically significant increase knowledge scores from pre to post-test. Specifically, participant's knowledge improved on outcomes of contagion, memorization, response, role differentiation and systems.	IV

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Table 8. Interventions in hospital or inpatient settings (n = 7)

Study	Setting and country	Intervention category	Intervention description	Participants	Suicide-related findings	Level of evidence
Apsche et al., 2006	Residential facility for the treatment of aggression, USA	Psychological (MDT)	Mode deactivation therapy (MDT).	20 male adolescent residential patients referred to the same residential treatment facility for the treatment of aggression (mean age = 15.5).	Mean suicidal ideation scores decreased at each time point in both groups, but this difference was greater in the MDT condition. The authors interpret this as MDT reduces suicidal risk.	III-1
Donaldson et al., 2005	Emergency department, USA	Problem-solving	2 conditions: Skills-based treatment (SBT) and supportive-relationship treatment (SRT). Both SBT and SRT were individual-based approaches that included brief collateral contacts with the parent(s) at the onset of each session. SBT focused on problem solving and affect management skills. SRT was supportive in nature and focused on the adolescent's mood and behaviour as well as factors that contribute to adolescent suicidal behaviour.	39 adolescents who presented to a general paediatric emergency department or inpatient unit of a child psychiatric hospital following a suicide attempt (mean age = 15).	Significant decreases in suicidal ideation at 3- and 6-month follow-ups were obtained, but there were no differences between groups. There were six reattempts in the follow-up period.	II
Katz et al., 2004	Inpatient unit, Canada	Psychological (DBT)	In this study, the DBT program ran for 2 weeks and comprised 10 daily, manualized DBT skills training sessions. Patients in the DBT program also were seen twice per week for individual DBT psychotherapy to review diary cards and conduct behavioural and solution analyses. Finally, the patients participated in a DBT milieu (with DBT-trained nursing staff) to facilitate skills generalization.	62 young people who were admitted to a psychiatric inpatient unit for making a suicide attempt or having severe suicidal ideation. BPD NOT criteria for inclusion (mean age = 15.4).	Both groups demonstrated significant reductions in suicidal ideation and parasuicidal behaviour at 1 year but there were no significant differences between the groups.	III-1

Study	Setting and country	Intervention category	Intervention description	Participants	Suicide-related findings	Level of evidence
King et al., 2015	Emergency department, USA	Psychological (motivational interviewing)	*Teen Options for Change (TOC):* focus on adolescents' values, goals, and options for behavioural change. Intervention received psychoeducation resources plus personalized feedback about their screening responses. Also participated in an adapted motivational interview (35–45 minutes) with a mental health professional.	49 young people aged 14-19 years seeking services for non-psychiatric emergencies who screened positive for suicide risk.	TOC had a nonsignificant impact on suicidal ideation. Adolescents in both groups— TOC and treatment as usual—showed significant reductions in suicidal ideation across the two months.	II
Perera & Kathriarachchi, 2011	Emergency department, India	Problem-solving	Each subject allocated to the experimental group was offered four one-hour sessions of problem-solving counselling by the same therapist. Problem solving techniques were applied and each counselling session was pre-determined. The first session was offered to each subject after the initial assessment. Subsequent sessions were offered one week, two weeks, and one month after the first session.	124 patients who were engaged in DSH, were not diagnosed as having a major psychiatric disorder, and who were categorized as medium and low-intent cases on the suicide intent scale (aged 15-24).	There were no repeated suicidal attempts in the experimental group while there were two attempts in the control group. In the final assessment, 100 percent of the experimental group felt that their suicide attempt was unwise, while only 26.1 percent in the control group felt so.	III-1
Preti et al., 2009	Inpatient clinic, Italy	Multimodal	*Programma 2000* is a multi-modal, comprehensive program targeted at the early detection and intervention for persons at the onset and for those with a high risk of psychosis. Patients receive a comprehensive, tailored and flexible intervention package, based on the assessment results. Includes psychoeducation, cognitive behavioural therapy (CBT), both structured and unstructured psychosocial interventions and pharmacotherapy, when necessary.	186 patients aged 17 to 30; first contact with any public mental health service from the catchment area for a first episode of psychosis or being referred to Programma 2000 with a suspected psychosis (mean age = 23).	Significant reduction in suicidal ideation 1 year after enrolment into the program. No prescribed drug emerged as being statistically related to a reduced risk of suicide ideation at the 1-year follow-up.	IV

Study	Setting and country	Intervention category	Intervention description	Participants	Suicide-related findings	Level of evidence
Rotheram-Borus et al., 2000	Emergency department, USA	Multimodal	Standard ER care included evaluations to determine whether the suicide attempt was serious enough for either medical or psychiatric hospitalization, and to prescribe appropriate medical procedures to be administered (e.g., gastric lavage). The participants and their mothers received a referral to the SNAP outpatient therapy. Specialized ER care introduced three changes to the standard ER care procedures: 1) six groups of primary ER staff were trained in separate 2-hr sessions on how to enhance positive patient interactions, reinforce the importance of outpatient treatment, and recognize the seriousness of suicide attempts; 2) a 20-min "soap opera" videotape was shown to all participants and their mothers in the ER to instil realistic expectations regarding treatment; 3) a bilingual crisis therapist met with the participants and their mothers in the ER to screen and discuss the videotape, conduct a therapy session, and contract for follow-up outpatient treatment.	140 female adolescent suicide attempters (SA; mean age = 14.9) and their mothers (88% Hispanic).	11 participants in the standard care condition and 6 in the specialized care condition re-attempted suicide over 18 months. Reattempts were similar across conditions, however, the base rate was so low as to not allow meaningful comparisons across conditions. There were no differences in reideation based on the ER care condition. Time to suicidal reideation varied based on the number of sessions attended by the SA. The analysis suggests that participation in seven or more sessions is protective for youth with low or moderate symptomatology; however, a significant interaction effect indicated elevated rates of reideation among highly symptomatic youth who attended seven or more sessions.	III-1

Table 9. Interventions in outpatient or community settings (n = 20)

Study	Setting and country	Intervention category	Intervention description	Participants	Suicide-related findings	Level of evidence
Alavi et al., 2013	Community, Iran	Psychological (CBT)	12 sessions of CBT over 3 months.	30 adolescents with suicide attempt in the past 3 months and were admitted in one of 3 hospitals in Iran (mean age = 16.1).	Significant decreases in suicidal ideation scores in intervention group after 12 weeks. No significant changes in the scores of the control wait-list group.	II
Brent et al., 2009a	Community, USA	Psychological (CBT) & pharmacological	Treatment consisted of a 6-month intervention - either a medication algorithm derived from the Texas Medication Algorithm, psychotherapy (modified CBT), or the combination.	124 adolescents who had made a recent suicide attempt and had unipolar depression, aged 12-18.	The 6-month morbid risks for suicidal events and for reattempts were lower than those in other comparable samples. Could not compare groups because nonrandomised.	III-2
Brent et al., 2009b	Community, USA	Pharmacological (SSRI or venlafaxine) & psychological (CBT)	CBT + Pharmacotherapy—Medication dose was either 20 mg of SSRI or 150 mg of venlafaxine, with an option at week 6 to increase to either 40 mg of an SSRI or 225 mg of venlafaxine if insufficient improvement was observed.	334 adolescents aged 12-18 years with moderate to severe DSM-IV MDD despite being in active treatment with an SSRI of at least 8 weeks duration.	No effect of treatment on occurrence of or time to suicidal adverse events. Venlafaxine associated with a higher rate of self-harm adverse events in those with higher suicidal ideation.	II
Diamond et al., 2010	Community, Israel	Family therapy	*Attachment-Based Family Therapy (ABFT):* focuses on strengthening parent–adolescent attachment bonds to create a protective and secure base for adolescent development. Model is primarily a process-oriented, emotion-focused treatment, guided by a semi-structured treatment protocol.	341 suicidal adolescents identified in primary care and emergency departments (mean age = 15.1).	ABFT condition associated with significant decreases in suicidal ideation & clinical recovery. Benefits were maintained at follow-up.	II

Study	Setting and country	Intervention category	Intervention description	Participants	Suicide-related findings	Level of evidence
Esposito-Smythers et al., 2006	Community, USA	Psychological (CBT)	*Cognitive-Behavioural Treatment Protocol (CBT):* The full treatment protocol included acute (weekly sessions for 6 months), maintenance (bi-weekly sessions for 3 months), and booster (monthly sessions for 3 months) treatment phases delivered over the course of one year. Case management calls were made to parents, adolescents, school officials, and agencies (e.g., social services, juvenile court) as needed.	6 adolescents admitted to a psychiatric inpatient unit for suicidal ideation or suicide attempt and met criteria for alcohol abuse or dependence (mean age = 15).	5 participants reported reductions in suicidal ideation. 2 of the 5 participants made a suicide attempt, both of whom were referred back to the treatment program and subsequently improved.	IV
Esposito-Smythers et al., 2011	Community, USA	Psychological (CBT)	*Integrated outpatient cognitive behavioural intervention for co-occurring alcohol or other drug use disorder (AOD) and suicidality (I-CBT)* ***or*** *enhanced treatment-as-usual (E-TAU):* The I-CBT included individual adolescent, family, and parent training sessions. Included acute, continuation and maintenance phases as above.	40 adolescents & their families recruited from an inpatient psychiatric hospital with co-occurring AOD (mean age = 15).	Those randomized to I-CBT in comparison to E-TAU also reported fewer suicide attempts. Adolescents across groups showed equivalent reductions in suicidal ideation.	II
Fleischhaker et al., 2011	Outpatient, Germany	Psychological (DBT)	*Dialectical Behaviour Therapy-A* (DBT-A) delivered over a period of 16 to 24 weeks. The adolescents kept two appointments per week: Individual therapy (one hour) and participation in the multifamily skills training group (two hours). Regular phone contacts between individual therapist and patient occurred as needed.	12 females aged 13-19 with a diagnosis of BPD or at least 3 DSM criteria, who had engaged in NSSI or suicidal behaviour in the past 16 weeks.	Before the start of therapy, 8 of 12 patients had attempted suicide at least once. There were no suicidal attempts during treatment with DBT-A, or at the one-year follow-up.	IV

Study	Setting and country	Intervention category	Intervention description	Participants	Suicide-related findings	Level of evidence
Geddes et al., 2013	Outpatient, Australia	Psychological (DBT)	*DBT-A "life-surfing" programme:* 4 components: 1) Individual therapy – weekly sessions (twice weekly, if needed) for the length of the programme. Family members were invited to join when systemic issues dominated; 2) Family skills training group - 2 hours per week; 3) Phone consultation for adolescents; 4) Supervision/ consultation team who provide supervision & assess treatment integrity.	6 female adolescents either currently or recently CAMHS clients with a minimum of 3 BPD features (mean age = 15.1)	Adolescents reported a decrease in suicidality following participation in the DBT programme that was maintained at the three month follow-up.	IV
Hazell et al., 2009	Community, Australia	Group therapy	Group intervention informed by the principles of CBT, social skills training, interpersonal psychotherapy, and group psychotherapy. Consisted of an initial engagement phase provided over six sessions and optional attendance at a long-term group. Groups were held for 1 hour per week and provided by clinicians from community-based adolescent mental health services. Compared to routine care condition.	72 youth referred to a child and adolescent mental health service and reported 2+ episodes of self-harm in the past year, 1 in the past 3 months (mean age = 14.57).	No effect on suicidal ideation. More adolescents randomized to group therapy had self-harmed by 6 months, and there was a statistically nonsignificant trend for this pattern to be repeated in the interval of 6 to 12 months.	II
King et al., 2003	Community, Australia	Telephone counselling	*Kids Help Line:* Australian telephone counselling service for young people in crisis. Counsellors complete 1 week intensive telephone counselling training program and 250 hours or probation before being accredited as meeting basic competency standards. Counsellors selected on the basis of aptitude rather than professional background, although majority had relevant degrees.	101 callers to Kids Help Line.	Statistically significant decrease in callers' suicide ideation total from the beginning to end of the calls, with large effect size. Statistically significant decrease in suicide urgency scores.	IV

Study	Setting and country	Intervention category	Intervention description	Participants	Suicide-related findings	Level of evidence
Mehlum et al., 2014	Outpatient, Norway	Psychological (DBT)	Dialectical Behaviour Therapy: a comprehensive, principle-based, multi-modal, outpatient treatment that was developed for adults with BPD. Compared to Enhanced Usual Care condition (EUC).	77 adolescents treated at community child and adolescent psychiatric outpatient clinics with BPD symptoms.	DBT was superior to EUC in reducing frequency of self-harm, severity of suicidal ideation, and depressive symptoms, with generally large effect sizes for outcomes in the DBT-A condition, but weak or moderate outcomes in the EUC condition.	II
Pineda & Dadds 2013	Outpatient clinic, Australia	Family intervention	*Resourceful Adolescent Parent Program (RAP-P):* interactive psychoeducation program for parents of adolescents. Four 2-hour sessions implemented in a single-family format. Families were given the option to have their sessions held at the health centre or at home. Compared to Routine Care (RC).	48 suicidal adolescents aged 12-17 who presented to hospital or community mental health clinical services, and their parents (mean age = 15).	RAP-P was associated with reductions in suicidal behaviour. Benefits were maintained at follow-up with a strong overall effect size. Mediated by changes in family functioning.	II
Power et al., 2003	Outpatient clinic, Australia	Psychological	*LifeSPAN therapy:* comprises 8–10 individual sessions. The therapy was provided by one of two psychologists independent of the EPPIC service. There were four phases: initial engagement; suicide risk assessment/ formulation; cognitive modules; and a final closure/handover.	56 young people with psychosis who were rated as 'suicidal thoughts frequent, without intent or plan'; or 'specific suicidal plan and intent or suicide attempt'..	Both treatment and control patients improved progressively on ratings of suicide ideation and the number of suicide attempts. However, there were no significant differences between the groups in the relative change in ratings between each time point, though the intervention group did show a larger average drop in suicidal ideation.	II

Study	Setting and country	Intervention category	Intervention description	Participants	Suicide-related findings	Level of evidence
Rudd et al., 1996 Secondary pubs: Joiner et al., 2001; Wingate et al., 2005	Hospital, USA	Group therapy	Intensive, structured, time-limited group treatment. Structured within a problem-solving and social competence paradigm targeting fundamental skill development in addition to improved social functioning and adaptive coping. Participants spent approximately 9 hrs each day at the treatment facility for 2 weeks. Treatment included three basic components: a traditional experiential-affective group, psychoeducational classes, and an extended problem-solving group.	264 suicidal young adults (mean age = 22).	No significant between-group differences were observed at 6 and 12 months. Significant improvement on suicidal ideation in both conditions but no differences between groups.	II
Slee et al., 2008	Medical centre, Holland	Psychological (CBT)	Participants were randomly assigned to either the TAU, or TAU plus intervention group. Participants in the intervention group received 12 sessions of CBT developed for prevention of self-harm, in addition to TAU. Sessions were weekly or as needed in crisis situations.	90 young people who had recently self-harmed, presenting to the Leiden University Medical Centre (mean age = 23.9 – CBT; 25.4 – TAU).	Intervention group displayed a significant reduction in self-harm and suicidal ideation compared to those in the TAU only group. 2 participants in the TAU only group died by suicide.	II
Spirito et al., 2015	Community, USA	Family intervention	*Parent-Adolescent CBT:* Parents and teens were each assigned their own therapist and therapy included individual sessions for parents and adolescents as well as conjoint family sessions. The adolescent sessions in PA-CBT were essentially the same as those in *Adolescent-Only-CBT.*	24 adolescents + parents. Adolescents met criteria for depression and had experienced suicidality. (mean age = 14.69 - PA-CBT; 14.00 - AO-CBT).	Adolescent and parent suicidal ideation improved equally in both groups during active and maintenance treatment, and remained low at follow-up in both groups.	II
Turner 2000	Outpatient clinic, USA	Psychological (DBT)	DBT: Patients received a minimum of 49 sessions and a maximum of 84 sessions of treatment during the study period. There were no significant differences between groups regarding the average number of treatment sessions during either the first or last 6-month periods.	24 patients treated in local emergency services for suicide attempts, diagnosed with BPD. Assigned to DBT or CCT (client-centred therapy control condition; mean age = 22).	Significant improvements in patients' behaviour were obtained for both treatments over time; however, the DBT-oriented therapy patients' gains were greater than those receiving CCT at both 6 months and 12 months. DBT-oriented therapy moved 11 of 12 patients into the clinically improved zone of suicide/self-harm.	II

Study	Setting and country	Intervention category	Intervention description	Participants	Suicide-related findings	Level of evidence
Vitiello et al., 2009	Community, USA	Psychological (CBT) and pharmacotherapy (antidepressants)	*Manualized CBT-SP:* specifically aimed at modifying known risk factors for suicide, such as depression, with the goal of preventing recurrence of suicidal behaviour. CBT-SP consisted of up to 22 sessions, including both individual and parent-youth sessions. *Antidepressant pharmacotherapy (Med):* followed an established treatment algorithm for pharmacological treatment of depression in youths.	85 youths who had made a suicide attempt in the last 90 days at met criteria for a number of affective disorders/depression (mean age = 15.7).	Results apply to combination treatment. Depression and suicidal ideation scores were moderately correlated at baseline, and both declined significantly during treatment.	III-1
Wintersteen & Diamond 2013	Primary care settings, USA	Multimodal	1) All members of a clinical service invited to attend suicide prevention training; 2) clinic provided with a standardized set of two suicide-specific screening questions and a brief second-tier assessment to be completed by either the provider or clinic social worker; 3) increased availability of outpatient treatment.	56352 adolescents presenting to the ED over two 3-year periods (pre- and post- intervention (mean age = 15).	Significant reduction in referrals to the ED in the year after the intervention, and more hospitalised, compared to 3 years pre-intervention reflecting more accurate assessment and referral.	IV
Wood et al., 2001	Outpatient, England	Group therapy	Participants randomly assigned to either group therapy plus routine care (intervention), or to routine care alone (control). The intervention group undertook an initial assessment, attended six 'acute' sessions followed by long term weekly therapy which they could exit at any time. Participants allocated to routine care received psychotropic medication where necessary, family sessions and non-specific one-on-one counselling.	63 adolescents referred to a child and adolescent mental health service who had deliberately self-harmed at least twice within a year (mean age = 14.2).	No significant effect found on depressive symptoms or suicidal ideation. Intervention group participants were less likely to have repeated DSH on two or more further occasions than control group.	II

Table 10. Interventions delivered immediately post-discharge (n = 13)

Study	Setting and country	Intervention category	Intervention description	Participants	Suicide-related findings	Level of evidence
Asarnow et al., 2011	Emergency department, USA	Family	*Family Intervention for Suicide Prevention (FISP):* an enhanced mental health intervention involving a family-based cognitive-behaviour therapy session in the ED designed to increase motivation for follow-up treatment and safety, supplemented by care linkage telephone contacts after discharge. Compared to Usual ED Care condition.	181 suicidal youths presenting to emergency department aged 10-18.	Neither the ED intervention nor community outpatient treatment (in exploratory analyses) was significantly associated with improved clinical/ functioning outcomes (incl. suicide attempts).	II
Asarnow et al., 2015	Community and emergency department, USA	Psychological & Family	SAFETY Program (Safe Alternatives for Teens & Youths): 12-week ecological cognitive-behavioural treatment designed to be integrated within emergency services and grounded in social-ecological theory. Emphasizes enhancing protective supports within social systems (family, peers, and community) and includes one therapist for the youth and another focusing on the family/community.	35 young people who had made a suicide attempt within the past 3 months (mean age = 14.89).	After 3 months there were statistically significant improvements on measures of suicidal behaviour (active suicidal behaviour & ideation; passive suicidal ideation).	IV
Cotgrove et al., 1995	Emergency department, UK	Token allowing readmission to hospital	Treatment - standard management plus a token allowing readmission to hospital on demand.	105 patients discharged from hospital following a suicide attempt (mean age = 14.9).	6% of treatment and 12% of control adolescents made further suicide attempts, but not statistically significant.	II

Study	Setting and country	Intervention category	Intervention description	Participants	Suicide-related findings	Level of evidence
Fleischmann et al., 2008	Community, Brazil; India; Sri Lanka; Islamic Republic of Iran; China (SUPRE-MISS)	Brief intervention/ contact	*Brief intervention and contact method (BIC):* The BIC treatment modality included, in addition to TAU, a 1-hour individual information session as close to the time of discharge as possible and, after discharge, nine follow-up contacts (phone calls or visits, as appropriate) according to a specific time-line up to 18 months (at 1, 2, 4, 7 and 11 week(s), and 4, 6, 12 and 18 months), conducted by a person with clinical experience (e.g. doctor, nurse, psychologist).	1867 suicide attempters identified by medical staff in the emergency units of eight collaborating hospitals across five countries (median age = 23).	Significantly fewer deaths from suicide occurred in the BIC than in the treatment-as-usual group.	II
Greenfield et al., 2002	Outpatient, USA	Multimodal	*Rapid-response outpatient model*: outpatient team oriented toward outpatient care immediately after assessment in the emergency department. Team members initiated telephone contact with every referred patient and his or her family to plan a follow-up appointment.	286 suicidal adolescents who came to the emergency department of a paediatric hospital (12-17 years).	Intervention group had a lower hospitalization rate than control. Both groups achieved similar decreases in levels of suicidality.	III-2
Harrington et al., 1998	Community, UK	Family intervention	5-session program: first in hospital or home soon after recovery from overdose, next four at home. All members of the family were encouraged to attend, but to count as a session the adolescent and at least one parent had to be present.	162 children and adolescents aged 10-16 years who had attempted suicide by overdose.	No significant differences in suicidal ideation between the intervention and control groups.	II
Hassanian-Moghaddam et al., 2011	Community, Persia	Brief intervention/ contact	*Brief intervention and contact (BIC):* Each postcard had a different message and a variety of mostly floral images. Eight postcards were mailed at 1, 2, 3, 4, 6, 8, 10 and 12 months after discharge. A ninth postcard was sent for each participant's birthday. The intervention group also received TAU.	2300 individuals who self-poisoned (mean age = 24.13)	Significant reduction in suicidal ideation in both genders. Significant reduction in suicide attempts for females but not for males.	II

Study	Setting and country	Intervention category	Intervention description	Participants	Suicide-related findings	Level of evidence
Hassanzadeh et al., 2010	Community, Iran	Brief intervention/ contact	*Brief intervention and contact (BIC):* BIC group participated in a one-hour psycho-educational information session close to the time of discharge. After discharge, the subjects were followed up by phone calls or visits at: time of discharge, 1 week, 2 weeks, 4 weeks, 7 weeks, 11 weeks, 4 months, and 6 months after discharge.	623 adults who had attempted suicide (mean age = 25.26)	No significant difference was found between TAU and the BIC groups in whether they reattempted suicide or not. Significantly fewer attempts in the TAU group.	II
Huey et al., 2004	Hospital, USA	Family intervention	*Multisystemic therapy (MST):* family-centred, home-based intervention. MST is delivered in the family's natural environment (e.g., home, school, community) by therapists trained in the use of a variety of evidence-based interventions (e.g., contingency contracting, communication training, and behavioural parent training). MST is intensive (contact is daily when needed) yet time-limited (services range from 3 to 6 months). Compared to emergency hospitalization.	156 youths approved for emergency psychiatric hospitalization due to suicidal ideation or attempt, homicidal ideation/ behaviour, psychosis, or other threat of harm to self or others (mean age = 12.9)	MST was significantly more effective at decreasing rates of attempted suicide at 1-year follow-up; also, the rate of symptom reduction over time was greater for youths receiving MST. Treatment effects not found for suicidal ideation.	II
King et al., 2006	Hospital, USA	Social support	Youth-Nominated Support Team - Version 1 (YST-1): YST–1 was designed to supplement routine care for suicidal adolescents following psychiatric hospitalization, a period of high risk for suicidal incidents. It provides psychoeducation for support persons whom youths nominate from within and outside their family, and it facilitates the supportive weekly contact of these support persons with the suicidal adolescent.	289 suicidal, psychiatrically hospitalized adolescents (mean = 15.3).	No main effects for YST–1 on suicide ideation or attempts. Relative to other girls, those who received YST–1 reported greater decreases in self-reported suicidal ideation.	II

Study	Setting and country	Intervention category	Intervention description	Participants	Suicide-related findings	Level of evidence
King et al., 2009	Hospital, USA	Social support	Youth-Nominated Support Team-Version II (YST-II): same asYST-1 but updated psychoeducational resources, youths only allowed to nominate adult support persons (in YST-1 they could nominate a peer), shortened intervention period (from 6 months to 3 months).	448 psychiatrically hospitalized and suicidal adolescents (mean age = 15.59).	YST-II had no effects on suicide attempts and no enduring effects on suicidal ideation scores.	II
Robinson et al., 2012	Community, Australia	Brief intervention/ contact	12 postcards sent once a month for 12 months.	165 young people with a history of suicidal threats, ideation, attempts and/or DSH (mean age = 18.6).	No significant effect of the postcard intervention was found on suicide risk.	II
Wharff et al., 2012	Emergency department, USA	Family intervention	*Family Based Crisis Intervention (FBCI)*: single visit family-based crisis intervention for suicidal adolescents and their families to assist in keeping safe when returning home from ER.	217 adolescents presenting to the ER with suicidality (intervention group). Matched to adolescents presenting to the ER during the previous 18 months (mean age = 15.6).	Intervention group significantly less likely to be hospitalised for suicidal ideation. 65% of participants were discharged, compared to 44.7% in the matched cohort.	III-3

Evidence base for locally driven systemic responses and impact on youth suicides

Table 11. Community-based interventions (n = 13)

Study	Setting and country	Intervention category	Intervention description	Participants	Suicide-related findings	Level of evidence
Baber & Bean 2009	5 small towns, USA	Multimodal	*Connect (formerly the Frameworks project):* Involves gatekeeper training, and also training young people to identify peers at risk and increase likelihood that they will seek assistance from an adult if they are concerned about another person.	157 adults representing various constituencies in the community and 131 ninth-grade students.	Adults - significant increase in sense of competence and confidence in responding to youth. Youths - statistically significant increase in mentioning seeking adult assistance for a person at risk and increase in sense of responsibility to do something to help a peer who they were concerned about.	IV
Bean & Baber 2011	Two rural communities, USA	Multimodal	*Connect* (formerly the Frameworks project; as above).	648 adults representing various constituencies in the community and 204 high-school students.	Significant changes in knowledge and attitudes about suicide for adults and young people. Adults' preparedness to help also increased significantly as did the likelihood that youth participants would seek adult assistance if they were concerned about a peer.	IV
Capp et al., 2001	Shoalhaven community, NSW, Australia	Gatekeeper training	One-day workshops to increase the ability of the local community to identify individuals at risk of suicide, mobilise local informal helping networks and, where necessary, facilitate help-seeking behaviour.	44 members of the Shoalhaven Aboriginal communities and workers from the Aboriginal Interagency Network. Only aboriginal people in the evaluation (mean age = 36).	Significant increase in knowledge and confidence. No increase in intentions to help (high at both T1 and T2). Significant decrease in likelihood of "intentions to refer to the mental health service" (attributed to increases in confidence).	IV

Study	Setting and country	Intervention category	Intervention description	Participants	Suicide-related findings	Level of evidence
CDC 1998	Western Athabaskan tribe in rural New Mexico, USA	Multimodal	Involved training student gatekeepers, outreach to families after suicide, immediate response and follow-up for reported at-risk youth, community education about suicide prevention, and suicide-risk screening in mental health and social service programs.	15-19 year olds in the population.	Youth suicide rates varied after program implementation but they remained substantially lower than before it was implemented. Rates for all other age groups demonstrated considerably less variation in the same time period.	IV
Chagnon et al., 2007	Community and schools from a single metropolitan area in Canada	Gatekeeper training	One day per week for 3 weeks. Teaches helpers to learn to recognise warning signs in order to intervene with young people by helping them identify alternative means of solving their problems and referring them to services. Uses lectures and role plays.	71 school staff and community workers engaging with young people.	Training participants significantly improved their knowledge and attitudes at follow-up, exceeded the level of knowledge of the control group. Also increased in skills. At 6 month follow-up, improved attitudes were maintained but knowledge and skills diminished (although were significantly greater than at T1).	II
Coleman & Del Quest 2015	Community (including social service agencies, schools, churches) in Oregon, USA	Gatekeeper training	*QPR, ASIST & RESPONSE* All of these trainings provide knowledge about suicide risk and prevention, target trainee attitudes and confidence, and may include modelling and rehearsal of specific behavioural strategies.	127 gatekeepers in the community (mean age = 45).	Large increases in participants' perceptions of their suicide prevention preparedness and efficacy found for all programs. All the trainings demonstrated large changes in the attitudinal variables which declined modestly at follow-up. ASIST participants were more likely than other participants to ask about suicide in follow up.	III-I

Study	Setting and country	Intervention category	Intervention description	Participants	Suicide-related findings	Level of evidence
Garraza et al., 2015	Counties in the USA	Multimodal	*Garrett Lee Smith Memorial Suicide Prevention Program (GLS):* Funds different suicide prevention programs including education and awareness programs, screening, gatekeeper training, improved community partnerships and linkages to service, postvention, and crisis hotlines.	Young people living in the target counties (466 intervention counties and 1161 control).	Counties implementing GLS program activities had significantly lower suicide attempt rates among youths 16 to 23 years of age in the year following implementation of the GLS program than did similar counties that did not implement GLS program activities. There was no evidence of longer-term differences in suicide attempt rates or differences in rates of those aged over 23.	III-2
Hacker et al., 2008	USA	Multimodal	Community response to youth suicide to assist with contagion containment. Included development of a community response team; improved media relations; focus groups for survivors; and presentations to stakeholders.	Data on adolescents living in the community.	The community experienced one suicide and no fatal overdoses in 10-24 year olds since implementation of the program.	IV
Keller et al., 2009	Community, USA	Gatekeeper training	*QPR* – as above. Lethality assessment, attitude awareness, and information related to cultural factors were incorporated.	416 gatekeepers from a range of sectors including child welfare, education, juvenile justice, health (mean age = 40.3)	Significant overall linear improvement followed by decreases at 6 months for perceived suicide prevention knowledge, self-efficacy to prevent youth suicide, and inevitability of youth suicide.	
May et al., 2005	Tribal Nation Community, USA	Multimodal	*The Adolescent Suicide Prevention Project*: 15-year public-health oriented suicide prevention program. Key components included identifying risk factors specific to the population; identifying those at high risk and providing services; implementing a community-wide systems approach to enhance knowledge and awareness.	American Indian/Alaska natives in New Mexico living on a reservation between 1988 and 2002.	Results indicated a decrease in suicidal gestures and attempts, with suicidal deaths neither significantly increasing nor decreasing. Self-destructive acts (suicides, attempts and gestures) were reported to decline by 73%.	IV

Study	Setting and country	Intervention category	Intervention description	Participants	Suicide-related findings	Level of evidence
Pfaff et al., 2001	GP clinics, Australia	Gatekeeper training	One-day training workshop designed to enhance ability to recognise, assess and manage young patients at risk of suicide.	GPs who attended a youth suicide prevention workshop (N = 23) AND patients who presented to the GPs (203 pre-workshop and 220 post-workshop).	After training, GPs demonstrated increased recognition rates of suicidal patients. Higher recognition rates do not necessarily lead to changes in patient management.	IV
Walrath et al., 2015	USA	Multimodal	Garrett Lee Smith Memorial Suicide Prevention Program (GLS; as above).	Participants included those from counties with access to a GLS-funded gatekeeper training program and matched control counties who did not have access to the program.	Counties that implemented the GLS programs were found to have significantly lower suicide rates in those aged between 10-24 years than similar counties who did not receive the GLS training.	III-2
Wiegersma et al., 1999	Health care departments, Netherlands	Access to healthcare	Open consultation hours by health care departments for students in secondary schools.	Data sources: mortality rates (n = 137); hospital admissions (n = 182) & reported attempts (n = 4997).	Regions where youth health care departments have made open-access consultation available for students were not shown to have lower rates of suicide or suicide attempts compared to those regions were no consultation was available.	IV

Table 12. Means restriction (n = 3)

Study	Setting and country	Intervention category	Intervention description	Participants	Suicide-related findings	Level of evidence
Lubin et al., 2010	Community, Israel	Means restriction	Legislation introduced to prevent Israeli Defence Force soldiers from taking their weapons home on weekends.	Israeli youth 18-21	40% decline in the number of suicides annually after the change of policy.	III-3
McPhedran & Baker 2012	Community, Australia	Means restriction	Stringent firearm legislation – introduced in 1996.	Australian youth	No evidence of an impact of the reforms among the 15 to 24 and 25 to 34 age groups.	III-3
Niederkrotenthaler et al., 2009	Community, Austria	Means restriction	Legislation to raise the minimum age of a firearm purchase from 18 to 21 years and inclusion of regular checks of safe gun storage in homes.	Austrian youth	Short-term significant increase in the number of suicide by firearm in adolescents after the reform followed by a significant downward trend.	III-3

Table 13. Public service announcements or media-based interventions (n = 3)

Study	Setting and country	Intervention category	Intervention description	Participants	Suicide-related findings	Level of evidence
Jenner et al., 2010	Community, USA	PSA/Media	*Louisiana Partnership for Youth Suicide Prevention program* - media campaign over two years, included billboards, ads in newspapers, PSAs on the radio and in movie theatres. Second year had stronger youth focus.	Community members	Sustained increase in calls to lifeline over time. Impact estimates suggest that movie advertisements had the most robust effect, followed by bus boards, print advertisements, and billboards. Could not determine number of calls from youth.	III-2
Klimes-Dougan & Lee 2010	University, USA	PSA/Media	3 conditions - billboard, TV add, no information. Billboard ad: "Prevent suicide, treat depression - see your doctor". TV add: described depression as "a brain illness," listed salient symptoms of depression (including "it can even lead to suicide"), and urged depressed individuals to seek medical help ("see your doctor").	279 university students (mean age = 22.41)	TV group significantly more likely to agree that suicide can be prevented by treating depression. Significantly lower help-seeking scores for the billboard group than the TV ad group and the no-information group.	II
Klimes-Dougan et al., 2009	Secondary school, USA	PSA/Media	Same as above.	426 high school students (mean age = 15.24)	Females estimated higher rates of suicidal risk than males, and high-risk participants estimated higher rates of suicidal risk than low-risk participants. Low-risk participants endorsed help-seeking attitudes more strongly than high-risk participants - Low- and high-risk participants in the no-information condition were more comparable, but in the billboard condition and in the TV-ad condition high-risk participants were less likely to endorsed help-seeking attitudes.	II

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