

NZHTA REPORT
12 April 2002

Suicide prevention topic 2:
What is the efficacy of crisis interventions?

A critical appraisal of the literature

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This report should be referenced as follows:

Day P. & Dawson S. Suicide prevention topic 2: What is the efficacy of crisis interventions?
NZHTA Report 2002.

2002 New Zealand Health Technology Assessment (NZHTA)
ISBN 1-877235-23-7

ACKNOWLEDGEMENTS

This review was commissioned by the Suicide Working Group of the New Zealand Guidelines Group (NZGG).

The staff of NZHTA developed this review. It was prepared by Mr Peter Day (Researcher) and Dr Shelagh Dawson (Researcher) who critically appraised the evidence. The literature search strategy was developed and undertaken by Ms Margaret Paterson (Information Specialist). Ms Tracey Smitheram and Miss Becky Mogridge assisted with the retrieval of articles. Mrs Ally Reid (Secretary/Word Processor) provided document formatting. Internal peer review was provided by Dr Ray Kirk.

Dr Annette Beautrais (Consultant) provided invaluable input on technical and methodological issues, assistance with article selection and peer review. Ms Emma Suttich (NZGG) provided helpful guidance with the topic development, article selection and facilitated liaison with the NZGG.

The Canterbury Medical Library provided invaluable assistance with the retrieval of articles used in this report.

NZHTA is a Research Unit of the University of Otago funded under contract to the Ministry of Health.

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LIST OF ABBREVIATIONS

BDI	–	Beck Depression Inventory
c.f.	–	compared with
CI	–	confidence intervals
CPN	–	community psychiatric nurse
DSH	–	deliberate self harm
Dx	–	diagnosis
EMI-B	–	Emotional Well-Being inventory
ER	–	Emergency Room
ERFUT	–	Emergency Room Follow-up team
f/u	–	follow-up
GT-S	–	Giessen Test for self-image
HASS	–	Harkavy Asnis Suicide Survey
ITT	–	intention to treat
MA	–	meta-analyses
Nss	–	not statistically significant
Nssd	–	not statistically significantly different
OPC	–	outpatient clinic
RCT	–	randomised controlled trial
RR	–	risk ratio
Rx	–	treatment
SCL-90	–	Symptom Checklist (90 items)
SNAP	--	Successful Negotiation/acting Positively program
SR	–	systematic review
U-BO	–	Social Anxiety Questionnaire
ssd	–	statistically significant difference
Vs	–	versus
WHO	–	World Health Organisation

Scope of systematic review of suicide prevention

The development of this systematic review involved consultation between the NZHTA and the Suicide Working Group.

LITERATURE SEARCH

Main search terms

Medline subject terms (MeSH terms): suicide, suicide attempted, self-injurious behavior, self-mutilation, poisoning, overdose, hotlines, crisis intervention, firearms.

Psychinfo subject terms: attempted suicide, suicide, suicidal ideation, exp suicide prevention centers, exp crisis intervention, hot line services, exp weapons, drug overdoses, emergency services.

Additional keywords: suicid*, parasuicid*, crisis, crises.

Principal sources of information

The following databases were searched using the search strategies outlined in **Appendix 1**.

Bibliographic databases

Medline
Embase
Cinahl
Psychinfo
Current Contents
Science/Social Science Citation Index
Index New Zealand

Review databases

Evidence-based medicine reviews
Cochrane Database of Systematic Reviews
DARE
NHS Economic Evaluation Database
Health Technology Assessment Database

The search was restricted to information from 1990 in English. Each research question required a separate literature search.

Note: hand searching of journals, or contacting of authors for unpublished research was not undertaken during the search process.

The complete search strategies are given in **Appendix 1**.

INCLUSION AND EXCLUSION CRITERIA

Inclusion and exclusion criteria were firstly applied to the abstracts captured by the literature searches. Those papers considered for inclusion in the literature appraisal were retrieved and this warranted the exclusion of further papers based on the availability of these in full text.

Peer reviewed studies were considered for this review if they used one of the following study designs:

- systematic review or meta-analysis
- randomised controlled trial (RCT)
- controlled clinical trial (CCT)
- cohort study
- case-control study
- quasi-experimental e.g. before and after study
- descriptive study.

Note: the 'grey' literature was included, where appropriate, for New Zealand specific studies looking at special population groups: Maori, Pacific Island, Asian and the elderly.

STUDY INCLUSION CRITERIA

The following criteria was used to **include** studies for appraisal:

- study population are persons presenting following suicide attempt, expressing suicidal ideation, suicide threat
- study set in emergency department
- study set in tertiary mental health service
- study published in 1990 or later
- study written in English
- outcomes considered include:
 - repeat presentations for suicidality
 - repeat suicide attempts
 - mortality from suicide.

STUDY EXCLUSION CRITERIA

The following criteria was used to **exclude** studies from appraisal:

- study population primarily (50% or more) those with deliberate self-harm in the absence of suicide intent
- study population primarily (50% or more) those involved in assisted suicide
- study population primarily (50% or more) presentations for self-mutilation
- study population primarily (50% or more) children 12 years of age and under
- study focus is on the treatment of people with drug/substance abuse or dependence, that is treatment directed to their addiction rather than any suicide attempt
- study population are criminal offenders
- studies on suicide prevention interventions specifically for people with HIV/AIDS
- studies with small numbers of case presentations (one to five cases)
- studies concerned with suicide in homicidal people
- studies concerned with school-based suicide prevention interventions
- studies concerned with economic analyses
- citations which are letters to the editor, comments, editorials, abstract only
- studies where population is primarily a special population e.g. with affective or underlying personality disorder (and therefore potential confounded of study results and treatments).

STUDY SELECTION

Studies were selected for appraisal using a two-stage process. Initially, the titles and abstracts (where available) identified from the search strategy were scanned and excluded as appropriate. The full text articles were retrieved for the remaining studies and these were appraised if they fulfilled the study selection criteria outlined above.

Ninety-eight papers were identified via the search strategy and 35 retrieved (11 as background only). Eight papers were formally reviewed (including four relevant papers previously reviewed for Topic 1 on follow-up) and 16 papers excluded.

TABLES 1 AND 2 (EVIDENCE TABLES)

Summaries of appraisal results are shown in tabular form and include:

- study reference and country
- study design
- study quality grading and evidence level
- study arm description of intervention, service, treatment
- patient inclusion and exclusion criteria
- number of patients included in study sample
- study outcomes and p-values and/or 95% confidence intervals
- comments on the study and its internal validity issues arising from the study appraisal.

P-values unless otherwise stated relate to between group comparisons.

APPRAISAL METHODOLOGY

Articles were formally appraised using the checklist schedules and hierarchy of evidence coding system developed by the Scottish Intercollegiate Guidelines Network (SIGN). Validated criteria were used to appraise the studies selected for review. Key facets of the selected studies (including limitations) were documented in the text. Conclusions were drawn based on the study design and the specific problems associated with individual studies. The evidence presented in the selected studies were assessed and classified according to the SIGN grades of guideline recommendation by the suicide prevention guideline group.

The final grading code was allocated based upon the study design and study quality.

For a Systematic Review, Meta-Analysis or RCT studies the grades were (1++, 1+ or 1-). To receive a 1++ grading the following criteria needed to be fulfilled:

- clearly defined study question
- a clear description of an adequate randomisation design and process
- absence of baseline differences in demographic variables and other potential confounding variables between intervention groups post-randomisation
- an adequate concealment method and use of single blinding in outcome assessment
- outcomes measured in a standard, valid and reliable way
- all study arms treated equally
- adequate statistical power
- an ITT analysis was presented.

Factors (four or more) that consigned studies to a 1- grading included:

- open study
- study groups were not treated equally
- ITT analysis not presented, analysis not based on randomised allocation
- baseline study differences
- outcome assessment not blinded to allocation

- inadequate method or description of randomisation and concealment
- significant omissions or errors in patient demographic information and outcome results.

All other Systematic Review, Meta-Analysis and RCT studies were graded as 1+.

Other quasi-experimental (before and after design) studies received a 2- grading. Although not of an equivalent design to that of cohort and case-control studies (grade 2++, 2+, 2-), the 2- grading for these quasi-experimental studies reflects the analytical design of these types of studies. Non-analytical studies – e.g. case series are given an evidence grade of 3.

These quasi-experimental studies were evaluated using internal validity criterion such as subject selection methods and comparability of patient groups, assessment tools, outcome measures and follow-up.

Within each grade, papers are presented in alphabetical order according to first author surname.

Study limitations

This question examines the efficacy of crisis interventions for persons presenting following a suicide attempt, expressing suicidal ideation and suicide threat. Primary outcomes considered are the impact during follow-up on repeat presentations for suicidality, repeat suicide attempts and mortality from suicide. Other outcomes, such as improvement in depression etc, are included where significant due to the paucity of good data answering this question. A number of studies included in this topic overlap with an earlier review topic on the kinds of follow-up needed to reduce the risk of repeated suicide attempts/suicide.

Table 1 (pages 7-10) and **Table 2 (pages 11-12)** contain all included, critically appraised papers (ie. Table 2 contains appraised papers, which were also included for question 1). Appendices 1-3 contain excluded papers (and the reasons for exclusion), bibliography and search strategies. Four Quasi-experimental studies (all graded 2-) are presented in **Table 1 (pages 7-10)** while, one systematic review (graded 1+) and three randomised control trials (two graded 1+, one graded 1-) are presented in **Table 2 (pages 11-12)**. Papers were excluded for several reasons: for multiple methodological shortcomings which were highly likely to give biased results (two papers), providing level 4 (expert opinion) evidence only (two papers), no follow-up data presented (four papers), suicide attempt/ideation data not analysed separately (four papers), information in paper dealt with in another paper (one paper), or not addressing the above research question (three papers).

Overall, the evidence suggests that no firm conclusions can be reached on the efficacy of different crisis interventions, largely due to the limited number of trials that have taken place and to the small size of most of these trials. The variety of interventions and non-standardisation of 'standard' care makes any kind of comparison of interventions difficult. There is very little evidence to suggest that crisis intervention as opposed to 'standard care' reduces repeat suicide attempts. From the evidence that was found, it would appear that specialist telephone help lines may be of some help in decreasing suicidal urgency in the short-term, but evidence is lacking as regards to the long-term benefits of this crisis intervention. There are few studies that have assessed the outcomes of suicide crisis interventions, more research is needed in this area (Feldman & Finguerra 2001).

Individual study limitations are described in the comment section in **Tables 1 and 2 (pages 7-12)**.

Limitations to the review methodology that need to be considered in developing the suicide prevention guideline, include restriction to:

- articles published from 1990 onwards
- the published literature
- English language articles only
- reviewing each study by one researcher only
- study evaluation criteria did not cover aspects of statistical methodology such as the appropriateness of the data collected and the statistical tests used to analyse this.

In developing a guideline for suicide prevention, consideration will need to be given to studies published pre-1990. Important articles of interest were published in the pre-1990 time period so methods should be developed by the guidelines group to assess whether the new evidence presented in this review is sufficient to alter any recommendations included in previous evidence-based guidelines.

Restriction to the published literature is likely to lead to bias since the unpublished literature tends to consist of studies not identifying a significant result.

Restriction to English language may result in study bias, but the direction of this bias cannot be determined.

None of the articles appraised were set in New Zealand. Therefore, the generalisability of these studies to the New Zealand setting needs to be considered.

The studies were initially selected by examining the abstracts of these articles. Therefore, it is possible that some studies were inappropriately excluded prior to examination of the full text article.

There is a limitation on space in **Tables 1 and 2 (pages 7-12)** therefore, study details have been summarised.

This review was conducted over a limited timeframe (January 2002 – April 2002).

Table 1. Evidence table of appraised articles

Title of review: What is the efficacy of crisis interventions?

Study; design type; evidence grading; country	Intervention/ comparison Outcome measure	Criteria for Inclusion/ Exclusion	Results/Outcome	Comments including methodological issues
(Greenfield et al. 1995) Quasi-experimental (before and after design) Grade 2- Country: Canada	Youth crisis outpatient follow-up by Emergency Room Follow-up Team (ERFUT) over 1 year (3 rd year of ERFUT operation) compared with the year prior to ERFUT creation. Outcome measures: Psychiatric admissions to general paediatric hospital, repeat presentations at ER.	Inclusion: Adolescent psychiatric patients presenting at ER.	412 adolescent ER patients seen for psychiatric reasons prior to creation of ERFUT vs 568 patients seen during ERFUT operation. 16% reduction in hospital admissions (P<0.001). Decrease in return ER patients (nss). Proportion of ERFUT vs non ERFUT patients returning to ER (nssd). Mean number of return ER visits/hospitalizations per patient (nssd). No deaths (all causes) during three year follow-up period in experimental group.	<ul style="list-style-type: none"> • range of DSM-III-R diagnoses. Sample review of 40 ERFUT cases, 75% suicidal, ages 13-17, mostly female • no demographic breakdown of patients available • only secondary outcomes reported, hospitalization rates and returns to ER for all types of psychiatric admissions. No data on repeat suicide attempts/suicidality presentations.

Table 1. Evidence table of appraised articles (continued)

Study; design type; evidence grading; country	Intervention/ comparison Outcome measure	Criteria for Inclusion/ Exclusion	Results/Outcome	Comments including methodological issues
(Mishara et al. 1997) Quasi-experimental Before & After Grade 2- Country: Canada	Effectiveness of telephone intervention with suicidal callers. Outcome measure: decreased suicidal urgency. 2 groups studied: 1. chronic (repeat caller) 2. acute caller	Inclusion: All calls on the 1 st line to ring during set 4-hour shifts. Exclusion: Only calls that were not related to suicide were rejected. No other exclusion criteria presented other than that 5% of telephone helpers refused to consent to enter trial.	263 suicidal callers made 613 calls to 2 suicide prevention centres in French speaking Quebec. Data collected in 1988 and 1990. 59% of callers women. Age ranged from 13-72 yrs, Mean 35yrs (SD = 12). 71% of callers reported previous suicide attempts. Mean suicidal risk at beginning of call was 4.4 on the 9-point Morissette 'suicide urgency scale' (1 = minimal). Mean decrease in the 9-point 'Suicide urgency scale' from beginning to end of the call was .40 $p < .001$. Suicidal urgency ratings decreased from beginning to end in 138 calls (27%) and increased in 2 calls (1%) in which there was a suicide attempt after the intervention. The level of urgency decreased more frequently among acute callers (35%) compared to chronic callers (24%) $p < .01$. Three individuals were known to have attempted suicide following contact with the centre.	<ul style="list-style-type: none"> • observers listened to as many different 4-hour shifts as possible • telephone helpers and callers were blind to which calls were being monitored • the suicidal urgency ratings could not be tested for reliability since rating of urgency made by helpers themselves & their expectancies may have biased this measure • 60% of callers had previous contacts with mental health professionals, indicating the possible presence of serious psychiatric disorders • follow-up of suicide risk only 48 hours.

Table 1. Evidence table of appraised articles (*continued*)

Study; design type; evidence grading; country	Intervention/ Comparison Outcome measure	Criteria for Inclusion/ Exclusion	Results/Outcome	Comments including methodological issues
<p>(Rotheram-Borus et al. 1996)</p> <p>Quasi-experimental (before and after design)</p> <p>Grade 2-</p> <p>Country: USA</p>	<p>Specialised care (staff training workshops, video of ER procedures for patients & families, 1 family crisis therapy session) + standard care c.f.</p> <p>Standard care ER program (Pediatric and psychiatric evaluation).</p> <p>Outcome measures: Symptomatology, treatment adherence, depression and suicide ideation (post discharge assessment).</p> <p>Assessments at presentation, discharge and outpatients (3 months).</p>	<p>Inclusion: Female adolescent suicide attempters presenting to ER.</p> <p>Exclusion: Wrong age, low IQ, no parent/family, out of town residence, admitted to psych unit for >1 week.</p>	<p>140 patients (and their mothers), 75 recruited pre-intervention and 65 post-intervention. Recruitment period from March 1991 to February 1994.</p> <p>Intervention group c.f. historical control group:</p> <ul style="list-style-type: none"> ▪ lower depression (BDI scale), <i>ssd</i> $p < 0.10$ ▪ less suicidal ideation (HASS scale), <i>ssd</i> $p < 0.01$ ▪ greater adherence to outpatient treatment, <i>ssd</i> $p = 0.02$ ▪ greater completion of SNAP program (6 sessions over 3 months) 52% vs 39%, <i>nssd</i>, $p = 0.11$. 	<ul style="list-style-type: none"> • female adolescent suicide attempters, injection method (87%), mean age 15 years, Latino (88%), all described as 'low SES'. History of one or more previous attempts in 31% • no demographic differences between groups • consecutive patient enrolment (non-random) of assessed suicide attempters in two 18 month periods (pre and post intervention) • outpatient treatment adherence evaluation study, only secondary outcomes reported here, no data on repeat suicide attempts/suicidality presentations • study also reported in Rotherum-Borus et al., 2000 looking at post-ER outcomes over a 18 month period (see below).

Table 1. Evidence table of appraised articles (continued)

Study; design type; evidence grading; country	Intervention/ comparison Outcome measure	Criteria for Inclusion/ Exclusion	Results/Outcome	Comments including methodological issues
<p>(Rotheram-Borus et al. 2000)</p> <p>Quasi-experimental (before and after design)</p> <p>Grade 2-</p> <p>Country: USA</p>	<p>Specialised care (staff training workshops, video of ER procedures for patients & families, 1 family crisis therapy session) + standard care c.f.</p> <p>Standard care ER program (Pediatric and psychiatric evaluation).</p> <p>Outcome measures: Symptomatology, treatment adherence, depression and suicide ideation (post discharge assessment).</p> <p>Assessments at presentation, discharge and outpatients (3 months).</p>	<p>Inclusion: Female adolescent suicide attempters presenting to ER.</p> <p>Exclusion: Wrong age, low IQ, no parent/family, out of town residence, admitted to psych unit for >1 week.</p>	<p>140 patients (and their mothers), 75 recruited pre-intervention and 65 post-intervention. Recruitment period from March 1991 to February 1994.</p> <p>Nssd across care conditions for suicide reattempts over 18 month follow-up period.</p> <p>Nssd across care conditions for suicide re-ideation over 18 month follow-up period.</p> <p>Participation in 7+ follow-up sessions protective effect for youth with low-moderate symptomatology, $p<0.081$.</p> <p>Elevated rates of re-ideation in highly symptomatic youth attending 7+ follow-up sessions, $p<0.015$.</p>	<ul style="list-style-type: none"> • study also reported in Rotherum-Borus et al., 1996 looking at outpatient treatment adherence post-ER over 3 month period (see above) • this study evaluates outcomes over 18 month follow-up period post-ER.

Table 2. Evidence table of relevant but previously appraised articles from topic 1 on follow-up

Study; design type; evidence grading; country	Intervention/ comparison Outcome measure	Criteria for Inclusion/ Exclusion	Results/Outcome	Comments including methodological issues
(Van der Sande et al. 1997a) SR & MA Grade 1+ Country: The Netherlands	Various interventions (see results) vs standard care. Outcome measure: Repetition of suicide attempt.	Inclusion: Prospective RCTs of Rx and/or improved compliance following suicide attempt. Exclusion: Study population mentally handicapped &/or learning disabilities.	A ssd found for cognitive-behavioural treatment (4 studies, total 122 patients, overall RR= 0.5, CI 0.3-0.8). No ssd found for: 1. psychiatric management of poor compliance vs standard care 2. guaranteed in-patient shelter 3. psychosocial crisis intervention.	<ul style="list-style-type: none"> 2 databases searched (Medline, Psychlit) + lateral reference search. 31 papers retrieved, 15 met inclusion criteria. Papers grouped into 4 categories methodological concerns: homogeneity of categories, publication bias (negative results less likely to be published) cognitive-behavioural treatment result based on 4 studies (including Salkovskis et al 1990 and McLeavey et al 1994 reviewed below), only 1 with an intention to treat analysis, small numbers in each study, high baseline rates of previous suicide attempts in study possibly biasing the results towards high risk patients only, less effect seen with longer f/u guaranteed in-patient shelter result based on 2 studies, both using cards for emergency readmission to hospital psychosocial crisis result based on 2 studies, 3 month follow-up, weekly outpatient appointments, problem resolution methods intervention.
(Evans et al. 1999) RCT Grade 1+ Country: England	Standard care+green card vs standard care. Outcome measure: Repetition of self-harm (f/u 6 months) Patients recruited between November 1994 and July 1996 (2 hospitals), October 1995 to July 1996 (1 hospital)	Inclusion: All adult patients (age range not specified) admitted to hospital following episode of self-harm. Exclusion: Normal residence outside hospital catchment areas; multiple contacts and non-compliant with psychiatric services in preceding 6 months; severe aggression; drug and/or alcohol misuse leading to multiple presentations and non-compliance.	1301 admitted for DSH, 390 patients self-discharged/discharged before psychiatric assessment, 57 met exclusion criteria and 27 erroneously excluded. 827 randomised into standard care+green card (417) and standard care only (410). Nss found in repeat self-harm rates between the two groups. Ssd in rates for previous DSH patients between the two groups. Nss in rates for first-time DSH patients between the two groups.	<ul style="list-style-type: none"> experimental care = standard care + green card with hospital-based 24-hour telephone crisis counselling contact details this study differs from Morgan et al 1993 (see below) in that Evans et al was not restricted to first-time self-harm patients only, and the green card did not include an offer of hospital admission self-harm includes deliberate self-poisonings and deliberate self-mutilations methodological concerns: Possible biases include the large number 390/1301 not entered into study and the repetition of DSH being assessed by repeat hospital attendance rates only (episodes treated by GP and/or no treatment sought not recorded), findings not necessarily generalisable to patients not admitted overnight average age for green card group = 32.9 years, 42% male; average age for control group = 33.8 years, 47.3% male. Other demographics between groups described as similar but not tested.

Table 2. Evidence table of relevant but previously appraised articles from topic 1 on follow-up (continued)

Study; design type; evidence grading; country	Intervention/ comparison Outcome measure	Criteria for Inclusion/ Exclusion	Results/Outcome	Comments including methodological issues
(Morgan et al. 1993) RCT Grade 1+ Country: England	Standard care + green card vs standard care alone. Outcome measure: Repetition of self harm (f/u period 1 year) No recruitment period provided	Inclusion: No previous episode of deliberate self-harm; resident in hospital catchment area; (age range not specified).	101 in experimental group, 111 in control group. Nss reduction in repetition of self harm in experimental group cf control (p value not provided).	<ul style="list-style-type: none"> • experimental care = standard care + a green card (information for contacting doctor in emergency) • standard care = A&E assessment and referral to primary healthcare team or psychiatric admission • good randomisation process and both groups' characteristics similar • only study to limit enrolment to first episode of self harm • nssd in demography between groups. Mean age of experimental group = 27.4 years, mean age control = 32.5 years.
(Van der Sande et al. 1997b) RCT Grade 1- Country: The Netherlands	Intensive in-patient & community intervention vs standard care. Outcome measures: Repeat suicide rates at 1 year and patient wellbeing as assessed by the SCL-90 and Hopelessness scale. Patients recruited between January 1993 and March 1995	Inclusion: Patients over 15 presenting to A&E following suicide attempt not in need of subsequent psychiatric hospitalisation. Exclusion: Habitual self-mutilation; alcohol or drug addiction or heavy user; accidental overdose; non-Dutch speaking; non-resident in hospital catchment area; psychiatric hospitalisation; imprisonment; acute psychosis; recurrent consultations with hospital liaison psychiatry.	140 in intensive intervention group, 134 in standard care. No ssd in repeat suicide rates between the two groups (p=0.59). No ssd in psychological wellbeing ratings between the two groups.	<ul style="list-style-type: none"> • suicide attempt defined using WHO multicentre study in parasuicide definition • intensive intervention = short hospital admission (1-4 days) + out-patient therapy with CPN using problem-solving therapy + 24 hour access to unit • standard care = A&E assessment and treatment (not described). 25% admitted, 75% referred to OPC • f/u assessments done at 3, 6 and 12 months • high drop-out of participants particularly in control group (33% intensive intervention and 64% control drop-out by 12 months) • analysis done on 'intention to treat' basis • nssd in demography between the two groups. For intervention group, mean age 35.8, male 34.3%. Control group mean age 36.6, male 34.3% • possible biases: researchers not blinded to allocation, conclusions about wellbeing only based on 60% of group • no power analysis performed.

Appendix 1

SEARCH STRATEGIES

Cinahl

1982 to November Week 5 2001

1. suicide/ or suicidal ideation/ or suicide, attempted/ (1974)
2. suicid\$.tw. (2182)
3. parasuicid\$.tw. (38)
4. or/1-3 (2840)
5. Crisis Intervention/ (574)
6. Psychiatric Emergencies/ (207)
7. crisis.tw. (2483)
8. crises.tw. (309)
9. or/5-8 (3209)
10. 4 and 9 (110)
11. limit 10 to (english and yr=1990-2002) (87)
12. from 11 keep [selected references]
13. "suicide prevention (iowa nic)"/ (1)
14. "crisis intervention (iowa nic)"/ (1)
15. ((4 or 13) and (9 or 14)) not 11 (23)
16. limit 15 to yr=1990-2002 (0)

Cinahl

1982 to December Week 2 2001

1. suicide/ or suicidal ideation/ or suicide, attempted/ (1982)
2. suicid\$.tw. (2193)
3. parasuicid\$.tw. (38)
4. or/1-3 (2855)
5. Injuries, Self-Inflicted/ (222)
6. 1 or 2 or 3 or 5 (3026)
7. crisis intervention/ (577)
8. psychiatric emergencies/ (207)
9. crisis.tw. (2505)
10. crises.tw. (313)
11. or/7-10 (3236)
12. 4 and 11 (110)
13. 6 and 11 (114)
14. 13 not 12 (4)
15. from 14 keep [selected references]

Current Contents

1993 Week 26 to 2001 Week 51

1. suicid\$.mp. (13096)
2. parasuicid\$.mp. (348)
3. 1 or 2 (13157)
4. crisis.mp. (15249)
5. crises.mp. (2865)

6. 4 or 5 (17403)
7. 3 and 6 (207)
8. limit 7 to english language (177)
9. from 8 keep [selected references]

Embase

1988 to 2001 Week 48

1. Suicide/ (7766)
2. suicidal behavior/ or self poisoning/ or suicide attempt/ (5570)
3. suicid\$.tw. (13462)
4. parasuicid\$.tw. (273)
5. or/1-4 (16851)
6. crisis intervention/ (785)
7. crisis.tw. (6838)
8. crises.tw. (1735)
9. Telephone/ (2704)
10. or/6-9 (11220)
11. 5 and 10 (333)
12. Firearm/ (970)
13. Drug Overdose/ (3716)
14. emergency medicine/ (6325)
15. emergency health service/ (3917)
16. or/12-15 (14550)
17. 10 and 16 (329)
18. spirito a.au. (70)
19. rotheram borus mj.au. (75)
20. 11 or 17 or 18 or 19 (770)
21. limit 20 to (english language and yr=1990-2002) (570)
22. letter.pt. (214290)
23. editorial.pt. (88412)
24. Case Study/ (914)
25. 21 not (22 or 23 or 24) (539)
26. from 25 keep [selected references]

Embase

1988 to 2002 Week 04

1. suicide/ or suicidal behavior/ or self poisoning/ or suicide attempt/ (12667)
2. suicid\$.tw. (13642)
3. parasuicid\$.tw. (274)
4. or/1-3 (17064)
5. Automutilation/ (1872)
6. 1 or 2 or 3 or 5 (18530)
7. Crisis Intervention/ (805)
8. crisis.tw. (6887)
9. crises.tw. (1749)
10. telephone/ (2774)
11. or/7-10 (11365)
12. 4 and 11 (337)
13. 6 and 11 (353)
14. 13 not 12 (16)
15. limit 14 to (english language and yr=1990-2002) (12)
16. from 15 keep [selected references]

Medline

1966 to October Week 5 2001

1. suicide/ or suicide, attempted/ (23444)
2. suicid\$.tw. (23132)
3. parasuicid\$.tw. (399)
4. or/1-3 (31869)
5. Crisis Intervention/ (3777)
6. crisis.tw. (16982)
7. crises.tw. (3805)
8. hotlines/ (1005)
9. or/5-8 (23163)
10. 4 and 9 (993)
11. firearms/ (1824)
12. Self-Injurious Behavior/ or Self Mutilation/ (3509)
13. Poisoning/ or Overdose/ (14819)
14. or/11-13 (20068)
15. 9 and 14 (112)
16. (spirito a or spirito al).au. (102)
17. rotheram borus mj.au. (72)
18. 10 or 15 or 16 or 17 (1235)
19. limit 18 to (english language and yr=1990-2002) (522)
20. letter.pt. (444983)
21. editorial.pt. (133891)
22. case report/ (1031559)
23. or/20-22 (1521689)
24. 19 not 23 (434)
25. from 24 keep [selected references]

Medline

1966 to January Week 2 2002

1. suicide/ or suicide, attempted/ (23665)
2. suicid\$.tw. (23436)
3. parasuicid\$.tw. (400)
4. or/1-3 (32238)
5. exp Self-Injurious Behavior/ (3546)
6. 1 or 2 or 3 or 5 (35217)
7. crisis intervention/ (3806)
8. crisis.tw. (17203)
9. crises.tw. (3846)
10. hotlines/ (1021)
11. or/7-10 (23455)
12. 6 and 11 (1022)
13. 4 and 11 (1005)
14. 12 not 13 (17)
15. limit 14 to (english language and yr=1990-2002) (8)
16. from 15 keep [selected references]

Psycinfo

1967 to December Week 1 2001

1. exp attempted suicide/ or exp suicide/ (11826)
2. suicidal ideation/ (1450)
3. suicid\$.tw. (19130)
4. parasuicid\$.tw. (495)
5. or/1-4 (19425)

6. suicide prevention centers/ (98)
7. exp Crisis Intervention/ (2893)
8. exp Suicide Prevention/ (1318)
9. crisis.tw. (9949)
10. crises.tw. (2743)
11. exp Hot Line Services/ (439)
12. or/6-11 (13396)
13. 5 and 12 (2175)
14. exp Weapons/ (503)
15. drug overdoses/ (436)
16. emergency services/ (1703)
17. or/14-16 (2609)
18. 12 and 17 (309)
19. (spirito a or spirito anthony).au. (103)
20. (rotheram bonus mary jane or rotheram borus m j or rotheram borus mary j or rotheram borus mary jane or rotheram mary or rotheram mary j or rotheram mary jane).au. (126)
21. 13 or 18 or 19 or 20 (2647)
22. limit 21 to (english language and yr=1990-2002) (1475)
23. limit 22 to ("0700 editorials" or "0810 case study" or 1200 letter) (29)
24. school\$.ti. (40636)
25. 22 not (23 or 24) (1358)
26. from 25 [selected references]

Psycinfo

1967 to January Week 3 2002

1. exp attempted suicide/ or exp suicide/ (11885)
2. suicidal ideation/ (1470)
3. suicid\$.tw. (19263)
4. parasuicid\$.tw. (496)
5. or/1-4 (19558)
6. self destructive behavior/ or self inflicted wounds/ or self mutilation/ (2433)
7. 1 or 2 or 3 or 4 or 6 (21501)
8. suicide prevention centers/ (98)
9. exp crisis intervention/ (2912)
10. exp suicide prevention/ (1332)
11. crisis.tw. (10005)
12. crises.tw. (2749)
13. exp hot line services/ (441)
14. or/8-13 (13472)
15. 5 and 14 (2193)
16. 7 and 14 (2224)
17. 16 not 15 (31)
18. limit 17 to (english language and yr=1990-2002) (17)
19. from 18 keep [selected references]

Appendix 2

INCLUDED, CRITICALLY APPRAISED STUDIES

Evans, M. O., Morgan, H. G., Hayward, A., & Gunnell, D. J. (1999). Crisis telephone consultation for deliberate self-harm patients: effects on repetition. *British Journal of Psychiatry*, 175, 23-27.

Greenfield, B., Hechtman, L., & Tremblay, C. (1995). Short-term efficacy of interventions by a youth crisis team. *Canadian Journal of Psychiatry - Revue Canadienne de Psychiatrie*, 40, 320-324.

Mishara B., Daigle M (1997). Effects of different telephone intervention styles with suicidal callers at two suicide prevention centers: an empirical investigation. *American Journal of Community Psychology*, 25, 6, 861-885.

Morgan, H. G., Jones, E. M., & Owen, J. H. (1993). Secondary prevention of non-fatal deliberate self-harm. The green card study. *British Journal of Psychiatry*, 163, 111-112.

Rotheram-Borus, M. J., Piacentini, J., Cantwell, C., Belin, T. R., & Song, J. (2000). The 18-month impact of an emergency room intervention for adolescent female suicide attempters. *Journal of Consulting & Clinical Psychology*, 68, 1081-1093.

Rotheram-Borus, M. J., Piacentini, J., Van Rossem, R., Graae, F., Cantwell, C., Castro-Blanco, D., Miller, S., & Feldman, J. (1996). Enhancing treatment adherence with a specialized emergency room program for adolescent suicide attempters. *Journal of the American Academy of Child & Adolescent Psychiatry*, 35, 654-663.

Van der Sande, R., Buskens, E., Allart, E., Van der Graaf, Y., & Van Engeland, H. (1997a). Psychosocial intervention following suicide attempt: A systematic review of treatment interventions. *Acta Psychiatrica Scandinavica*, 96, 43-50.

Van der Sande, R., Va Rooijen, L., Buskens, E., Allart, E., Hawton, K., Van der Graaf, Y., & Van Engeland, H. (1997b). Intensive in-patient and community intervention versus routine care after attempted suicide. A randomised controlled intervention study. *British Journal of Psychiatry*, 170, 35-41.

REFERENCE

Feldman, J., & Finguerra, L. (2001). Managed crisis care for suicidal patients. In Ellison, J. M. (Ed), *Treatment of Psychiatric Patients in Managed Care*, pp 15-38, Washington, DC: American Psychiatric Press.

Appendix 3

EXCLUDED, RETRIEVED STUDIES

The following papers were reviewed but rejected for inclusion in the analysis:

Bressi, C., Amadei, G., Caparrelli, S., Cattaneo, C., Cova, F., Crespi, S., Dell'Aringa, M., Ponti, F., Zirulia, V., & Invernizzi, G. (2000). A clinical and psychodynamic follow-up study of Crisis Intervention and Brief Psychotherapy in psychiatric emergency. *New Trends in Experimental & Clinical Psychiatry*, 16, 31-37.

Only 12% of study population had a history of suicide attempt. No relevant primary outcomes. No analysis of suicide attempt/ideation given.

Cotton, C., & Range, L. (1992). Reliability and validity of the suicide intervention response inventory. *Death Studies*, 16, 79-86.

Study assessing reliability and validity of suicide assessment tool, included in topic 3.

Evans M., Morgan G., & Hayward A (2000). Crisis telephone consultation for deliberate self-harm patients: How the study groups used the telephone and usual health-care services. *Journal of Mental Health*, 9, 2, 155-164.

No data presented re. repeat suicide attempts or suicidal ideation in control group.

Francis, E., Marchand, W., Hart, M., Carter, A., Schinka, J., Feldman, A., & Ordorica, P. (2000). Utilization and outcome in an overnight psychiatric observation program at a veterans affairs medical center. *Psychiatric Services*, 51, 92-95.

Observational study with little detail on suicide attempt/ideation and no analysis of results. 55% of subjects reported suicide ideation before intervention however suicide ideation not analysed at follow-up. Only a brief mention of suicide attempt rates given (i.e. 3 suicide attempts before intervention and 1 after). 77% of subjects had a drug/substance abuse problem.

Joiner T., Voelz Z (2001). For suicidal young adults with comorbid depressive and anxiety disorders, problem-solving treatment may be better than treatment as usual. *Professional Psychology: Research and Practice*, 32, 3, 278-282.

Multiple methodological faults, with little statistical detail. No statistical comparison of treatment vs usual care and reduction of suicide indices. Poorly described randomisation process. No data presented re. repeat suicide rates.

Kaltiala-Heino, R., Sorri, P., & Heikkinen, M. E. (1997). Crisis treatment in a consultation-liaison unit. *Nordic Journal of Psychiatry*, 51, 267-273.

Descriptive cross-sectional audit study with no relevant primary outcomes, no testing of crisis intervention. No follow-up of suicide risk.

Kienhorst, I. (1995). Crisis intervention and a suicidal crisis in adolescents. *Crisis*, 16, 154-156, 183.

Expert opinion and background article, level 4 evidence only.

Mezzina, R., & Vidoni, D. (1995). Beyond the mental hospital: crisis intervention and continuity of care in Trieste. A four year follow-up study in a community mental health centre. *International Journal of Social Psychiatry*, 41, 1-20.

General psychiatric admissions of which 33% characterised by suicide attempt. Multiple methodological faults, with little statistical detail. Suicide attempt seems only to have been covered as an aside and suicide data not analysed separately.

Morgan, V., & Coleman M. (2000). An evaluation of the implementation of a liaison service in an A & E department. *Journal of Psychiatric and Mental Health Nursing*, 7, 391-397.

DSH study population with no description of suicidal intent. No relevant primary outcomes as evaluation of service study. No analysis of suicide attempt/ideation presentations or reattempts.

Mishara, B., & Daigle M (1992). The effectiveness of telephone interventions by suicide prevention centres. *Canada's Mental Health*, 40, 3, 24-29.

Data presented in this paper is a repeat of the data reported by Mishara et al (1997), see above.

Reisch, T., Schlatter, P., & Tschacher, W. (1999). Efficacy of crisis intervention. *Crisis*, 20, 78-85.

Suicide ideation reduction is only implicitly implied. Study addresses possible factors which could lead to suicide attempt. 14% of study population attempted suicide and 42% reported serious contemplation of suicide however suicidal patients not separately identified in analysis.

Runeson, B., Scocco, P., DeLeo, D., Meneghel, G., & Wasserman, D. (2000). Management of suicide attempts in Italy and Sweden - A comparison of services offered to consecutive samples of suicide attempters. *General Hospital Psychiatry*, 22, 6, 432-436

Descriptive cross-sectional study comparing service provision in Italy and Sweden. No intervention tested, no follow-up nor relevant primary outcomes evaluated.

Schene, A. h, van Wijngaarden, B., Poelijoe, N. W., Gersons, B. P. (1993). The Utrecht comparative study on psychiatric day treatment and inpatient treatment. *Acta Psychiatrica Scandinavica*, 87, 427-436.

General psychiatric admissions, 27% of study population characterised by serious suicide attempt, no relevant primary outcomes, suicidal patients not separately identified in analysis.

Schoenwald, S. K., Ward, D. M., Henggeler, S. W., & Rowland, M. D. (2000). Multisystemic therapy versus hospitalization for crisis stabilization of youth: placement outcomes 4 months postreferral. *Mental Health Services Research*, 2, 3-12.

General psychiatric admissions, no relevant primary outcomes, suicidal patients not separately identified in analysis.

Turley, B. (2000). Lifeline youth suicide prevention project - final report. Institute of Child Health Research, Perth WA.

No intervention (telephone crisis counselling) tested, nor relevant primary outcomes. Focus on evaluation of service provision.

Appendix 4

BACKGROUND PAPERS RETRIEVED

American Academy of Child and Adolescent Psychiatry. (2001). Practice parameter for the assessment and treatment of children and adolescents with suicidal behaviour. *American Academy of Child and Adolescent Psychiatry. Journal of the American Academy of Child & Adolescent Psychiatry*, 40, 24S-51S.

Berman, A. L., & Jobes, D. A. (1994). Treatment of the suicidal adolescent. *Death Studies*, 18, 375-389.

Brown, G. K., Bruce, M. L., & Pearson, J. L. (2001). High-risk management guidelines for elderly suicidal patients in primary care settings. *International Journal of Geriatric Psychiatry*, 16, 593-601.

De Clercq, M., & Dubois, V. (2001). Crisis intervention models in the French-speaking countries. *Crisis*, 22, 32-38.

Fanslow, J. L., & Norton, R. (1994). A status report of suicide and parasuicide in the Auckland region. *Community Mental Health in New Zealand*, 8, 12-25.

Jerome, L. W., & Smolenski, J. (1998). Clinical techniques in crisis intervention: emergency counseling in cases of acute poisoning. *Hawaii Medical Journal*, 57, 474-475.

Kleespies, P. M. (2000). Behavioral emergencies and crises: An overview. *Journal of Clinical Psychology*, 56, 1103-1108.

Kleespies, P. M., Deleppo, J. D., Gallagher, P. L., & Niles, B. L. (1999). Managing suicidal emergencies: Recommendations for the practitioner. *Professional Psychology - Research & Practice*, 30, 454-463.

Kleespies, P. M., & Dettmer, E. L. (2000). An evidence-based approach to evaluating and managing suicidal emergencies. *Journal of Clinical Psychology*, 56, 1109-1130.

Neimeyer, R. A., & Pfeiffer, A. M. (1994). Evaluation of suicide intervention effectiveness. *Death Studies*, 18, 131-66.

Ottino, J. (1999). Suicide attempts during adolescence: systematic hospitalization and crisis treatment. *Crisis*, 20, 41-48.