Pediatric suicide-related presentations: a systematic review of mental health care in the emergency department

CRD summary
The review concluded that transition interventions were the most promising mental health-based suicide prevention focused interventions in the emergency department for reducing suicide-related outcomes and improving post emergency department treatment adherence in children and adolescents. Heterogeneity between patients (particularly in age), interventions and outcomes caused the authors to agree that their conclusions should be treated with caution.

Authors’ objectives
To evaluate the effectiveness of mental health-based suicide prevention focused interventions in the emergency department in children and adolescents.

Searching
Fifteen databases were searched from 1985 to October 2009 (full details reported) for publications in English and French. Search terms used for MEDLINE were reported in an online appendix and search terms used for other databases were available from the authors. Unpublished studies were identified by searching ClinicalTrials.gov and contacting authors of relevant studies. Bibliographies of retrieved articles were handsearched. Key journals and four relevant conference proceedings were searched.

Study selection
Randomised controlled trials (RCTs) and quasi-RCTs that evaluated mental health-based interventions were eligible for inclusion if they aimed to benefit paediatric patients with suicide-related behaviour. Interventions could be initiated in the emergency department or immediately after discharge from the emergency department. Eligible participants were aged up to 18 years. They were engaged through direct referral/enrolment or through parents or emergency department personnel. There were no restrictions on comparison interventions. Each study had to have at least one clinically relevant primary outcome. Outcomes could be health-related (rates of self-injurious behaviour, death by suicide, suicidal ideation), parent-related (reporting of means restriction) or care-related (service delivery, consultation, documentation). Primary outcomes were suicide death, subsequent suicide-related hospitalisation and treatment adherence post emergency department discharge. A post hoc decision was made to include studies that partly covered the eligible age range and extended into adulthood if the intervention was determined a priori to be appropriate for older adolescents. Some relevant studies were not accessed. One study-in-progress was excluded.

The studies were spread globally in developed and undeveloped countries. Most interventions were immediately post discharge from the emergency department. One study was based in the emergency department and used enhanced disposition planning. Thirty per cent of the studies were initiated in the emergency department and continued into the community post discharge (transition studies). Most post emergency department discharge interventions were one-on-one (patient plus health care provider). Such interventions used community-based outreach with referral planning, cognitive-behavioural therapy or interpersonal skills training and problem solving. One study used one-on-one family sessions. One study evaluated the effect of hospital admission.

Interventions used in the transition studies focused on emergency department-based evaluation and referral with immediate telephone/home-based support or psychiatric support until long-term care was in place or outpatient treatment sessions for both patient and a parent. The comparative groups mostly used standard or usual care, sometimes with a reduced level of the intervention. Full details of the interventions and their comparisons were given. Median age of patients ranged from 14 to 34 years. Half of the studies were of adolescents aged 12 to 18 years. Some studies included older patients. The average proportion of females was 72% (range 54% to 100%). Reported patient definitions were heterogeneous and included suicide attempt patients, suicide ideation/planning patients and patients with self-harm but no intention of dying.

Two independent reviewers performed the selection. Reviewer agreement was quantified using the K statistic (where
Assessment of study quality
Quality of RCTs was assessed using the five-point Jadad scale for control of bias, randomisation, blinding, withdrawals and drop-outs. Schultz guidelines were used to assess allocation concealment as adequate, unclear or inadequate. Quasi-RCTs were assessed using Downs and Black criteria to measure study reporting, external and internal validity and power to a maximum score of 29. A quality index score of more than 20 was considered good, 11 to 20 was considered moderate and less than 11 was considered poor.

Two independent reviewers assessed quality. Reviewer agreement was quantified using the K statistic (K=0.96 for RCTs and K=0.83 for quasi-RCTs). Discrepancies were resolved by consensus.

Data extraction
Numbers of events for each outcome were extracted and used to calculate relative risk (RR) or odds ratio (OR), each with 95% confidence intervals (CI). Mean differences (MD) with 95% CIs were calculated for continuous data. Numbers needed to treat were calculated.

Data were extracted by one reviewer who used a standardised form. Extracted data were checked for accuracy and completeness by a second reviewer. Discrepancies were resolved by consensus. Authors were contacted where information was missing or unclear.

Methods of synthesis
A narrative synthesis was provided due to heterogeneity in the interventions, clinical populations, suicide-related nomenclature and outcomes.

Results of the review
Ten studies were identified (3,818 participants, range 31 to 1,867): seven RCTs (3,073 participants, range 31 to 1,867) and three quasi-RCTs (745 participants, range 140 to 319). Double-blinding was not possible in the RCTs. Three RCTS scored 3 on the Jadad scale, three RCTs scored 2 and one RCT scored 1 due to a lack of blinding and unclear randomisation. Allocation concealment was unclear in four RCTs and adequate in three RCTs. The quasi-RCTs were of relatively good quality (scores of 20, 21 and 24 out of 29). Follow-up ranged from seven days to 24 months.

Emergency department-based: There was one RCT. A discharge planning intervention significantly increased attendance at post emergency department treatment sessions versus standard care (MD 2.6 sessions, 95% CI 0.05 to 5.15) when barriers to service were addressed.

Post-emergency department discharge intervention studies: There were five RCTs and one quasi-RCT. There was significantly increased adherence with service referral with community nurse home visits versus simple placement referral at discharge (RR 1.28, 95% CI 1.06 to 1.56; one RCT). Problem solving skills-based treatment did not significantly affect rates of suicide reattempt or suicidal ideation versus standard care, which included supportive relationship treatment (one RCT). Manual-assisted cognitive-behavioural therapy did not significantly reduce self harm versus usual standard therapy (one RCT). Interpersonal problem-solving skills training did not significantly reduce recurrent self harm versus brief problem-orientated treatment (one RCT). Hospital admission did not significantly reduce self harm versus discharge home (one RCT). A community-based outreach programme did not significantly reduce self harm versus standard care (one quasi-RCT).

Transition studies: There was one RCT and two quasi-RCTs. A brief educational intervention with referral options reduced the risk of suicide death after versus standard care (RR 0.10, 95% CI 0.03 to 0.41; one RCT). Specialised emergency department care plus SNAP (successful negotiation acting positively) versus standard care plus SNAP significantly increased treatment completion at 18 months (OR 2.78, 95% CI 1.20 to 6.67; one quasi-RCT) but did not significantly reduce risk of attempted suicide. A rapid response outpatient team model significantly reduced suicide-related hospitalisation versus standard care (RR 0.41, 95% CI 0.28 to 0.60; one quasi-RCT).
Number-needed-to-treat data were reported for some outcomes.

**Authors' conclusions**
Transition interventions appeared to be most promising for reducing suicide-related outcomes and improving post-emergency department treatment adherence. The evidence derived from these studies should be regarded as preliminary and used to inform paediatric-specific trials.

**CRD commentary**
The review addressed a well-defined question in terms of participants, interventions, study design and relevant outcomes. Relevant databases were searched. Unpublished studies were considered. Searches were only for studies published in English and French, so some relevant studies may have been missed. Study quality was assessed using suitable criteria and two methods. Efforts were made to reduce error and bias throughout the review process. Relevant study details were reported. A narrative synthesis was provided because of study heterogeneity. The included RCTs were of moderate to low quality. The quasi-RCTs were of relatively high quality. The authors' conclusions concentrated on the time of the interventions and did not focus on intervention type.

In view of the heterogeneity of the studies for participant definitions, patient age, interventions and outcome definitions, the authors suggested that their conclusions should be regarded as preliminary and, therefore, should be treated with caution.

**Implications of the review for practice and research**

**Practice:** The authors did not specifically state any implications for practice.

**Research:** The authors recommended that future studies use similar interventions and measure similar outcomes to those in the transition studies. Studies should evaluate individual elements of interventions rather than the intervention as a whole. There was a need for rigorous study designs for more conclusive evaluation of emergency department, post emergency department and transition emergency department care on suicide-related outcomes. Future studies should evaluate safety-planning interventions and long- and short-term effects. Studies needed to investigate effects of parental education leading to means restriction of the child/adolescent. Multi-site trials were required.

Outcome measurement should include treatment adherence and improved problem solving (particularly for studies of transition interventions), disposition planning and long-term clinical and health utilisation. Measurement of suicide-related behaviours required large sample sizes to counter low rates of re-occurrence. Confounding factors such as family environment, parental monitoring, co-morbidities and risk-taking behaviours should be investigated. Studies should focus solely on paediatric patients and use suitable scales to assess patient suicide risk and assess the quality of care provided by health professionals.

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