Family interventions and their effect on adolescent alcohol use in general populations: a meta-analysis of randomized controlled trials

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CRD summary
The review concluded that the overall effect of family interventions on adolescent alcohol use was small, but consistent and effective even at 48 months. The reliability of the authors' conclusions are uncertain due to lack of validity assessment, the potential for error and bias in the selection of studies and the small number of studies for each outcome.

Authors' objectives
To assess the effectiveness of family interventions in reducing adolescent alcohol use.

Searching
Cochrane Database of Systematic Reviews, ERIC, MEDLINE and PsycINFO were searched for studies published in Dutch and English between 1995 and September 2006. Search terms were reported. References lists of included articles and relevant reviews and meta analyses were searched for additional studies.

Study selection
Randomised controlled trials (RCTs) that evaluated the effectiveness of family interventions aimed at reducing alcohol use in adolescents aged under 16 in a general population were eligible for inclusion. Included studies had to assess intervention programs where at least half of the program was targeted directly at parents. All types of media were eligible for inclusion (such as, group sessions, skills training, booklets and CD-rom programmes). Studies that evaluated at risk groups, such as juvenile offenders or children of alcoholics, or evaluation of multi-component interventions where no separate analyses were performed for family interventions were excluded.

Interventions in the included studies included: home-based child and parent relations sessions, family meetings and follow-up telephone calls; CD-rom and print materials; clinician messages that encouraged family communication and rule setting regarding alcohol and tobacco onset; educational materials; training in parenting skills; a programme aimed specifically at African American families; and parent-only sessions that identified risk factors and promoted effective strategies and conflict management. Control groups, where reported, included child-focused CD-rom prevention programme, intervention focused on gun safety, bicycle helmet and seat belt use, minimal contact (including educational leaflets) and a school-based prevention program. Levels of randomisation varied across studies and were defined by the individual, school, community or paediatric practice. The ethnicity of children in most studies was predominantly white and mostly African-American in the others. The average age of children ranged from nine to 13.9 years. Follow-up time ranged from 18 to 48 months. Outcomes assessed included alcohol initiation (lifetime ever/never alcohol use), last month alcohol use (ever/never used alcohol in last 30 days or past month) and frequency of alcohol use (average number of drinking occasions in the past month; quantity and frequency of beer, wine and liquor consumption over last year; 30-day and seven-day frequency of alcohol use; and frequency of beer or alcohol consumption on past month).

One reviewer selected studies for inclusion.

Assessment of study quality
The authors did not state that they assessed validity.

Data extraction
Data were extracted for each outcome and used to calculate odds ratios (OR) with 95% confidence intervals (CI) and effect sizes (Cohen's d) on change in alcohol consumption in family intervention and control groups from each individual study. Data were extracted and reported separately for studies that reported data that compared two or more types of treatment. For studies that included intervention groups that were school-based, school-based plus parent and
minimal intervention control group, the school-based intervention group was used as the comparison group.

Data were independently extracted by two reviewers. Differences were resolved through discussion.

Methods of synthesis
Data from individual studies were combined using a random-effects model to calculate the combined odds ratios with 95% CI and Cohen’s d effect size (d) for standardised mean difference (MD). Separate analyses were conducted for alcohol initiation, last-month alcohol use and frequency of alcohol use. The most frequently reported follow-up time (either 24 or 30 months) was used.

Heterogeneity was assessed using the Q-statistic and the $I^2$ test. To explore possible heterogeneity, subgroup analyses were carried out on ethnicity, intervention type, randomisation level and year of publication. Meta regression was used to investigate the effect of study characteristics on analyses. Methods by Begg and Egger and visual examination of funnel plots were used to investigate the possibility of publication bias.

Results of the review
Nine RCTs in 18 publications were included in the review (n=unknown).

Alcohol initiation (seven RCTs): Overall, family interventions significantly reduced levels of alcohol initiation compared to control groups (OR 0.71, 95% CI 0.54 to 0.94). There was evidence of statistical heterogeneity for this analysis ($p<0.001; I^2=78.6\%$). When one outlying study was removed from the analysis the results remained significant and heterogeneity was reduced ($I^2=0\%$).

Last-month alcohol use (three RCTs): There were no significant differences between family interventions and control groups for last month alcohol use. There was no evidence of statistical heterogeneity ($p=0.170$), although the $I^2$ test was 40.4%.

Frequency of alcohol use (five RCTs): Overall, family interventions were significantly more effective in reducing frequency of alcohol use than control groups (MD -0.25, 95% CI -0.37 to -0.12) at follow-up. There was no evidence of statistical heterogeneity. Subgroup analyses reported no difference to the results when one study that reported the greatest effect was removed from the analysis.

Analyses over follow-up times (three RCTs): Overall analysis found no statistically significant differences for alcohol initiation at three follow-up points (12 to 18 months, 24 to 30 months and 36 to 48 months). However, after one study described as an outlier was excluded from the analysis, family intervention programs were found to be significantly more effective at 30 months (OR 0.49, 95% CI 0.30 to 0.80) and 48 months (OR 0.53, 95% CI 0.38 to 0.75), but not at 18 months (OR 0.71, 95% CI 0.25 to 2.01) compared with controls. Details of other subgroup analyses were reported.

There was no evidence of publication bias for any of the analyses.

Authors' conclusions
Findings suggested that the overall effect of family interventions on adolescent alcohol use was small, but consistent and effective even at 48 months.

CRD commentary
Inclusion criteria were defined for interventions, participants and study design, but not explicitly stated for outcomes. Several relevant sources were searched. Some efforts were made to reduce publication bias and formal assessment revealed no evidence of publication bias. The authors made some efforts to reduce language bias by including publications in two languages. Appropriate methods were used to reduce reviewer error and bias in the extraction of data, but only one reviewer selected studies and this lack of duplication may have led to error and bias. Only RCTs were included in the review, but the quality of the included studies was not assessed and so the results from the studies and any synthesis may not be reliable. Information about the included studies was presented in tables, but the total sample size could not be calculated based on the information presented. Data were combined in a meta-analyses and
reasons for the presence of statistical heterogeneity were explored. The authors reported that the included studies used different alcohol measurement methods and there were differences between studies in terms of interventions. Therefore, it may not have been appropriate to pool the results, particularly as there were few studies for some outcomes. The reliability of the authors’ conclusions are uncertain due to lack of validity assessment, potential for error and bias in the selection of studies and the small number of studies for each outcome.

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

**Practice:** The authors stated that due to the public health significance of adolescent drinking and its consequences, it is recommended that family interventions are implemented more broadly.

**Research:** The authors stated that further research was required with longer follow-up times, intent-to-treat analyses and in settings other than USA.

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