

Reducing young children's exposure to environmental tobacco smoke (ETS) in the home environment by a mother and child-delivered behavioral intervention

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Rationale: Epidemiologic evidence indicates that ETS is an important cause of lower respiratory tract illnesses, particularly among children less than 5 years of age. Numerous studies have established that young children's exposure to ETS comes mainly from homes. While parental smoking has been implicated as the primary source of children's ETS exposure, relatives and friends may also contribute to children's exposure. Thus, developing strategies to prevent children's involuntary exposure to ETS in their homes is crucial. We addressed this research gap by evaluating a novel intervention focused on using mother-child partnerships to restrict smoking in the home/car environments. The study was carried out in a low income, minority population over a two-year period, from December 2002 to November 2004.

Methods : Study participants were children (mean age, 4 years) attending Head Start (HS) centers (a federally-funded national preschool program) in Birmingham, Alabama. Of four randomly selected HS centers, two received a behavioral-based intervention (experimental group), while the other two received standard health education (control group). The experimental intervention, based on social learning theory concepts, had two components (mothers, children) and focused on increasing awareness, knowledge and skills in avoidance of ETS in homes and cars. Questionnaires administered to the mothers at baseline and in months three, nine and twelve of post-intervention, elicited information on smoking practices in the home and children's respiratory symptoms. The primary outcomes were children's ETS exposure as measured by urine cotinine levels (ETS exposure, ≥ 10 ng/ml; no/low ETS exposure < 10 ng/ml), and maternal reports of smoking practices in the household (home/car) and of children's respiratory symptoms.

Results. Of a total of 239 children (mean age, 4 years) who participated in the study, 134 were in the experimental group and 105 in the control group. About 46% of the children had ETS exposure (urine cotinine: median, 15ng/ml; range, 10-400ng/ml). About 49% of the children had at least one symptom of respiratory illness in the past 12 months. Mothers and grandmothers were more likely to be smokers in the home followed by fathers, aunts, uncles and cousins. At baseline, there were no differences between the experimental and the control groups with regard to the outcome variables. At first follow-up post-intervention, there were significant reductions in ETS exposure in the experimental group compared to the control group, as evidenced by urine cotinine levels ($p < 0.05$). Compared to the control group, children in the experimental group also had fewer school absences and increased enforcement of smoking restriction practices in the home environment; these differences were statistically significant. Differences in respiratory symptoms between the experimental and control groups were small.

Conclusions. About half this preschool study group was exposed to ETS in their homes. Post-intervention, substantial reduction in ETS, school absences and smoking practices in the home were noted, but declined slightly with time. Absence of changes in respiratory symptoms may be due to confounding by other known risk factors for respiratory illnesses. Reducing smoking in public spaces alone is not sufficient to control ETS exposure in this vulnerable age group, but should also be coupled with interventions to reduce smoking in spaces where children live, learn and play. Educating mothers and developing interventions that build on family bonds as in this study may be one effective way of reducing ETS exposures in the home environment. It is important to sustain such interventions on a long-term basis.