Scottish Government Health Directorates Chief Scientist Office

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First Steps to Smoke-free: Using air-quality feedback to facilitate smoke-free homes through the NHS Lanarkshire First Steps Programme (CZH/4/983)

Researchers

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Aim

Reducing children's exposure to second-hand tobacco smoke (SHS) is a key aim of the Scottish Government Tobacco Control strategy. This project aimed to deliver and test the efficacy of an air-quality feedback intervention to parents of young children exposed to SHS at home.

Project Outline/Methodology

Women involved in NHS Lanarkshire's First Steps programme for young first-time mothers were recruited to a trial to test if low-cost air quality monitors providing personalised feedback of household SHS were more effective than standard NHS advice in helping them protect their child from SHS. 120 women were recruited (response rate 70%) and randomised to one of two groups (A- standard advice; B- standard advice plus personalised feedback). Measurements of fine smoke particle levels in each home were made for a period of up to a week with those in Group B receiving their personalised results and discussing the timing of high SHS levels with their First Steps worker. Measurements were repeated 1-month later and again after 6-months. The primary outcome was a change in household particle concentrations at 1-month follow-up. In-depth interviews with 21 mothers and focus groups with workers who delivered the feedback were carried out to explore how the intervention could be improved.

Key Results

117 mothers completed the baseline measurement and intervention; 102 of those the 1-month follow-up measurement and 78 of those the 6-month measurement. SHS, as measured by fine particles called $PM_{2.5}$, were high in most of the homes measured before the intervention. The median value was 34$\mu g/m^3$, with nearly two-thirds of homes having concentrations higher than the World Health Organisation guidance value (25 $\mu g/m^3$) for this air pollutant.
After excluding participants who did not complete the 1-month follow up, and those with <24h of data, the median difference between 1-month and baseline $PM_{2.5}$ measurements for Group A (n=50) was +3.8 $\mu g/m^3$; Group B (n=50) was 0.1$\mu g/m^3$ with no statistical difference between the groups (p=0.76). There was a similar lack of change in $PM_{2.5}$ levels at the 6-month follow-up.
The in-depth interviews suggested that personalised air quality feedback increased mothers' capability and motivation to make their home smoke-free but that they often had limited opportunity to make these changes due to their complex circumstances. The First Steps workers involved in delivering this intervention generally found it a useful mechanism for raising the issue of SHS with their clients.

Conclusions

Providing personalised air-quality feedback may not be suitable for all groups of smoking parents and should be tailored to those at a more advanced stage of change in terms of household smoking rules and, importantly, with the physical and social opportunities to change.

What does this study add to the field?

Personalised feedback of air quality information using low-cost devices can be succesfully integrated to services provided by care providers. Their effectiveness in making housegholds smoke-free may be limited by the parents' social circumstances.

Implications for Practice or Policy

Targeted air-quality feedback may have some role to play in achieving and maintaining the Scottish Government's target of reducing children exposed to SHS at home to less than 6% by 2020.

Where to next?

An EU funded trial of real-time air quality feedback in 200 homes across four countries www.tackshs.eu

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