International Research Journal of Research in Environmental Science and Toxicology Vol. 12(1) pp. 1-3, January, 2023
Available online https://www.interesjournals.org/research-environmental-science-toxicology/archive.html

Expert Review

A Note on the Non-smokers Protected from Tobacco Smoke Exposure (TSE) in Indoor Public Places

Amber Christine*

School of Public Health, Sackler Faculty of Medicine, Tel Aviv University, P.O.B. 39040, Ramat Aviv 69978, Israel

*Corresponding Author's E-mail: Amberchristine@post.tau.ac.il

Received: 09-Jan-2023, Manuscript No. JREST-23-86312; **Editor assigned:** 11-Jan-2023, PreQC No. JREST-23-86312 (PQ); **Reviewed:** 25-Jan-2023, QC No. JREST-23-86312; **Revised:** 27-Jan-2023, Manuscript No JREST-23-86312 (R); **Published:** 31-Jan-2023, DOI: 10.14303/2315-5698.2023.16

Abstract

Children may be less likely to be exposed to tobacco smoke in smoke-free homes (TSE). A meta-analysis of the effects of interventions on changes in tobacco smoke pollution in the home, as measured by air nicotine and particulate matter (PM), was the goal of this study.

Methods: PsycINFO, Embase, MEDLINE, and PubMed were all searched. We included controlled trials of interventions designed to assist parents in protecting their children from exposure to tobacco smoke. Three reviewers' extracted data and two reviewers identified relevant studies.

Results: There were seven studies found. As measured by nicotine or particulate matter, interventions reduced home air pollution caused by tobacco smoke. 6 studies, 681 participants, $p = 0.02$ Separate analyses of PM and air nicotine revealed some advantages (PM nicotine: $N = 421$ in four studies, $p = 0.08$; PM: $N = 340$ in three studies, $p = 0.02$) At the follow-up of all studies, tobacco smoke pollution was still present in homes.

Conclusions: Tobacco smoke pollution (measured by air nicotine or PM) in homes is reduced by interventions designed to protect children from tobacco smoke, but contamination remains. After individual level intervention, the persistence of significant levels of pollution in homes may indicate the need for additional population and regulatory measures to help reduce and eliminate childhood exposure to tobacco smoke.

Keywords: TSE (tobacco smoke exposure), ETS (environmental tobacco smoke), Home air quality, nicotine in the air, Reparable small particles (RSPs)

INTRODUCTION

In many nations, non-smokers are protected from tobacco smoke exposure (TSE) in indoor public areas by law. However, the private sphere of the home, where both adults and children spend the majority of their time, is typically unregulated. Although bans on smoking in public places have significantly reduced overall exposure in many countries, some research indicates that the home is now becoming the primary source of exposure to tobacco smoke—from both secondhand and third hand smoke; This has occurred despite the fact that bans on smoking in public places have been linked to a decrease in the amount of tobacco smoke that children are exposed to. However, these bans have not brought smoking into the home (de Jonge P et al., 2018).

The harmful effects of TSE are experienced by approximately 40% of children worldwide; many of these children smoke in their own homes as "captive" smokers. Many health issues, including lower respiratory infections, asthma, and acute otitis media, sudden infant death syndrome, compromised lung function, school absenteeism, and days of restricted activity are increased when children are exposed. TSE has negative health effects that last into adulthood, and children of smoker parents are more likely to use tobacco (Park C et al., 2013)(Sarris J et al., 2014).

Having a strict prohibition on smoking in all areas of the home for all residents and visitors is one obvious way to achieve smoke-free living conditions. However, family members who smoke may be heavily addicted, and the vast majority of intervention trials that attempt to persuade parents to quit smoking for the benefit of their children fail. Smoking-free homes offer a voluntary means of reducing harm: Despite the fact that they are unlikely to completely shield children from parents who smoke, they have the potential to significantly reduce children's exposure to smoke and the associated risks without requiring parents to quit.

In fact, rather than focusing on quitting, some researchers have developed programs that target reducing child exposure to tobacco smoke; There was some evidence of benefit in a meta-analysis of these trials, which looked at the outcomes of behavioural change by parents or biochemical measures of exposure in children.

However, it is challenging to measure the effectiveness of interventions to protect children from exposure to tobacco smoke. Some parents may be reluctant to collect biomarkers from their children, and parent reports of child exposure may be inaccurate. On the other hand, the quality of the air in your home may be able to provide a reliable and non-invasive proxy measure of exposure. Second-hand tobacco smoke is known to be measured by air nicotine and particulate matter (PM), which have been widely used to measure indoor tobacco smoke air pollution in workplaces and homes. While nicotine in the air is only found in tobacco smoke, PM can be raised by a variety of sources; however, cigarette smoking in the home has been linked to significant rises in PM. To find out if these interventions had any effect on home tobacco smoke air pollution as measured by air nicotine or PM, this study conducted a systematic review and meta-analysis of intervention trials aimed at reducing child TSE (Liem A et al., 2017).

DISCUSSION

The current meta-analysis demonstrates that although interventions to shield children from exposure to tobacco smoke improve home tobacco smoke air pollution (air nicotine and/or PM), this improvement is only modest: In all studies, there was still some pollution in the homes after the intervention. The included studies showed that intervention groups had lower levels of PM and air nicotine at follow-up compared to control groups. However, children were still exposed to tobacco smoke to some degree, and no intervention completely eliminated exposure or protected children. Air nicotine is tobacco-specific, so any level above zero is indicative of smoking in the home or the entry of smoke produced outside of the home through windows, doors, ventilation systems, or other means. Although PM levels may have been affected by environmental exposures other than smoking, air nicotine is tobacco-specific (Vohra S et al., 2005).

These findings are set in the context of international standards for air quality. The maximum level of PM2.5 pollution for 24 hours set by the US Environmental Protection Agency is 35 g/m3; At 25 g/m3 (24-hour mean), the World Health Organization's threshold is lower. In the Butz 2011 study, both the intervention and control groups' average baseline values were higher than the WHO and EPA cut-offs (Intervention: 45.4, Command: 39.5). At the end of the study, the control group had an average of 38.9, which was higher than the EPA and WHO standards, while the intervention group had significantly decreased to 32.2, which was below the EPA standards but above the WHO standards. Butz used a combination of motivational interviewers and air cleaners in his intervention. The findings of the U.S. Surgeon General are consistent with the finding that despite using air cleaners, contamination persists; “exposure to second-hand smoke components cannot be controlled sufficiently through dilution ventilation or by typical air cleaning strategies, if the goal is to achieve no risk or a negligible risk,” according to the 2006 report. Because Lanphear collected information on PM3, not PM2.5, and presented geometric means, it was not possible to compare the results of Lanphear or Wilson, the other two studies that reported on PM, with the international standards. On the other hand, Wilson presented geometric means of PM2.5, which are incompatible with the untransformed numbers (Grace S et al., 2010) (Templeman K et al., 2011).

Since no level is considered safe, there are no comparable standards for nicotine's impact on air quality. However, Wipfli's study, which evaluated home air nicotine in smoking and non-smoking families in 31 countries, provides some information; She found that households with smokers had a median value of 0.18 g/m3, while households without smokers had a median value of 0.01. Five studies' raw data on air nicotine were available to us. The intervention groups' average baseline values ranged from 0.55 to 2.1, while the control groups' average follow-up values ranged from 0.17 to 1.4. Despite statistically significant reductions over the course of the trials in the intervention group versus the control group, these numbers suggest very high levels of indoor exposure prior to and after the completion of the interventions in both the intervention and control groups.

It is necessary to conduct objective measurements of the air pollution caused by tobacco smoke at home due to the significance of smoke-free homes in protecting children from exposure to tobacco smoke. First, parents can be helped to internalize the presence of smoke pollution in their homes and determine whether it is a safe environment by receiving objective feedback from direct measurement of smoke pollution. Second, if pollution is measured both before and after the intervention and if the study has a randomized control group, assessment of tobacco smoke air pollution permits an objective measure of the effect of the intervention. Thirdly, an intervention that encourages parents to quit smoking at home but does not alter child biomarkers of exposure may benefit from objective measures of air pollution caused by tobacco smoke. It may be easier to compare modifiable exposures in the home to exposures elsewhere if we knew more about objective home exposure levels (Lake J et al., 2012)(Pengpid S et al., 2018).

However, there was a lack of agreement among the studies in this review regarding the reporting formats and methods used to measure air nicotine and particulate matter. The decision to measure PM or air nicotine is the most significant issue. The significant advantage of air nicotine is that it is a "sensitive and specific indicator for second-hand smoke". The disadvantage of air nicotine is that it requires laboratory analysis, which is costly and prevents parents from receiving immediate feedback. PM, on the other hand, is not limited to tobacco smoke and can be influenced by a variety of factors, such as cooking fumes, traffic pollution, or construction dust. According to Wilson, the provision of immediate feedback from the PM was crucial to her intervention: According to the abstract, "the qualitative findings showed that mothers were shocked by the values measured in their homes." Another advantage of the current PM monitors (Sidepaks and Dylos monitors) is that they provide feedback on a per-unit-time basis (per-second or per-minute), as opposed to the current air nicotine monitors, which provide a straightforward summary value over a period of time (Stepleman LM et al., 2015).

CONCLUSIONS

The few studies that reported changes in particulate matter or air nicotine following interventions to protect children from tobacco smoke suggest that such programs are successful in reducing the pollution caused by tobacco smoke in homes. However, there is still a lot of contamination, which suggests that additional methods are required to fully protect children.

ACKNOWLEDGEMENT

None

CONFLICT OF INTEREST

None

REFERENCES

1. de Jonge P, Wardenaar KJ, Hoenders H, Evans-Lacko S, Kovess-Masfety V, et al (2018). Complementary and alternative medicine contacts by persons with mental disorders in 25 countries: results from the world mental health surveys. Epidemiol Psychiatr Sci. 27: 552-567.
2. Park C (2013). Mind-body CAM interventions: Current status and considerations for integration into clinical health psychology. J Clin Psychol. 69: 45-63.
3. Sarris J, Glick R, Hoenders R, Duffy J, Lake J, et al (2014). Integrative mental healthcare White paper: establishing a new paradigm through research, education, and clinical guidelines. Adv Int Med. 1: 9-16.
4. Liem A, Rahmawati KD (2017). The meaning of complementary, alternative and traditional medicine among the Indonesian psychology community: a pilot study. J Int Med. 15: 288-294.
5. Vohra S, Feldman K, Johnston B, Waters K, Boon H, et al (2005). Integrating complementary and alternative medicine into academic medical centers: experience and perceptions of nine leading centers in North America. BMC Health Serv Res. 5: 78-84.
6. Grace S, Higgs J (2010). Integrative medicine: enhancing quality in primary health care. J Altern Complement Med. 16: 945–950.
7. Templeman K, Robinson A (2011). Integrative medicine models in contemporary primary health care. Complement Ther Med. 19: 84-92.
8. Lake J, Helgason C, Sarris J (2012). Integrative mental health (IMH): paradigm, research, and clinical practice. The Journal of Science and Healing. 8: 50-57.
9. Pengpid S, Peltzer K (2018). Utilization of traditional and complementary medicine in Indonesia: results of a national survey in 2014-15. Complement Ther Clin Pract. 33: 156-163.
10. Stepleman LM, Penwell-Waines L, Valvano A (2015). Integrated care psychologists and their role in patient transition from medical to psychiatric specialty care settings: a conceptual model. Health Psychol Behav Med. 3: 154-168.