

Exposure of second hand smoke in women and children: A narrative review

Twinkle Sharma, Meenakshi Khapre

Department of Community and Family Medicine, AIIMS Rishikesh, Uttarakhand, India

ABSTRACT

Second-hand smoke is a neglected public health issue. Every year 1.2 million people die due to this exposure. Second-hand smoke is also related to various other diseases like cardiovascular diseases, lung diseases, low birth weight, maternal depression, etc. The purpose of this review is to look over various studies and to gain an understanding of existing research about second-hand smoke and its adverse effects. In addition, we tried to identify the barriers behind creating a smoke-free environment at home and successful strategies employed and suggestion given in various studies. A comprehensive search of the recent literature related to Second-hand smoke was undertaken using electronic databases like MEDLINE, PUBMED, Google Scholar, and Research gate. Keyword searches were conducted for publications published since 2004 or later on Second-hand smoke exposure in pregnant women. Prevalence of SHS among pregnant women ranged from 24% 92%. Lack of knowledge, absence of comprehensive smoking ban, low status of women was among the main contributing factors. Community awareness and counseling by primary health-care physician was found to be successful strategies. There are various cultural and social barriers behind a smoke-free home for pregnant women. Interventional approaches like focused counseling by primary care physicians can help to overcome this issue. There is a need for behavioral interventions and community awareness to be done in this aspect.

Keywords: COVID-19, pregnancy, second-hand smoke, tobacco smoke COVID-19

Introduction

Smoke that remains in the environment by active smokers is called as second-hand smoke (SHS). Every year approximately 1.2 million people die due to second-hand smoke exposure.^[1]

Second-hand Smoke: A neglected public health issue

The tobacco epidemic is one of the biggest threats to public health of the world and is amounting to 8 million deaths per year around the world.^[1] According to WHO “Every person should be able to breathe tobacco-smoke-free air”^[2] which can be difficult to attain in India as 80% of smokers are from

developing countries.^[1] Incomprehensive ban on smoking has taken this right to breathe in clean air from non-smokers of this world. Studies had confirmed the harmful effects of Second-hand smoke, especially in women and child population.^[3,4] However, the research on impact of SHS at a population level is limited.

This comprehensive review was planned to compile the studies on prevalence of second-hand smoke among pregnant women, assess the contributing factors and successful interventions executed in various studies and suggestion to reduce SHS exposure.

Methodology

A comprehensive search of the literature related to Second-hand smoke was undertaken using electronic databases like

Address for correspondence: Dr. Twinkle Sharma,
Department of Community and Family Medicine, AIIMS,
Rishikesh, Uttarakhand, India.
E-mail: twinklemoudgil08@gmail.com

Received: 09-07-2020

Revised: 17-09-2020

Accepted: 21-01-2021

Published: 31-05-2021

Access this article online

Quick Response Code:



Website:
www.jfmpc.com

DOI:
10.4103/jfmpc.jfmpc_1397_20

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

How to cite this article: Sharma T, Khapre M. Exposure of second hand smoke in women and children: A narrative review. J Family Med Prim Care 2021;10:1804-7.

MEDLINE, PUBMED, Google Scholar, and Research gate. Keyword searches were conducted for publications since 2004 or later on Second-hand smoke exposure among pregnant women.

Evidence on Second-hand smoke exposure among pregnant women

Number of studies had documented a varying prevalence of Second-Hand smoke exposure among pregnant women as given in Table 1.

Factors behind SHS exposure

Studies had documented many contributing factors for exposure to passive smoke in non-smoker pregnant women [Table 2]. Study conducted in India concluded that the ignorance, low status in the family and unfavorable social environment are the barriers for creating a smoke-free environment for pregnant

women who are not smokers and weakened preventive actions.^[6] Another factor reported was inefficacy of women in demanding a smoke-free home from their husbands.^[11] Educational programs and empowerment targeting younger and poor socio-economic status women are important to improve self-efficacy in adopting healthy behaviour to avoid second-hand smoke exposure for both husband and pregnant wife.^[12]

Legislation that comprises a partial ban on smoking in public spaces such as COTPA (2003) was also a contributing factor leading to increased prevalence of smoking in non-prohibited areas like homes.^[13,14] Sen Zeng *et al.* in their study (2019) found that a partial ban on smoking may barely bring any change in overall smoking behaviours and rather it will displace smokers from governed public places to other unregulated private places. This can lead to increased exposure of SHS in non-smokers at places like their homes and places of work.

Table 1: Prevalence of SHS among pregnant women in India

Type of Study	Place of Study	Study description	Prevalence	Key findings
Cross-sectional study ^[5]	Bach Mai Hospital, Hanoi, Vietnam	432 pregnant in hospital setting	64.5%	Exposure to SHS in non-smoker pregnant women is a principal problem in Vietnam.
Cross-sectional study ^[6]	India	Pregnant mothers attending the clinic	87%	Non-smoking pregnant women in India are often exposed to SHS and their preventive actions are very weak
Household survey ^[7]	India	Household survey on national level	37.7%	37.7 percent of pregnant women are exposed to second hand smoke at home.
Cross-sectional study ^[8]	India	National Family Health Survey-3 (2005-2006). cross-sectional survey.	25%	Higher tobacco consumption rates observed in women of reproductive age group. Antenatal SHS exposure was lesser in older age and higher socioeconomic status.
Cross-sectional study ^[9]	India	Study Participants were non-smoking women delivering a singleton live baby.	24%	Association between exposure to ETS* during pregnancy and increased risk of having a small gestation baby.
Cross Sectional Study ^[10]	Mongolia	Study participants were pregnant women who underwent antenatal check-ups.	44.8%	44.8% of UC** - determined non-smoking pregnant women were exposed to SHS.

*ETS: Environmental tobacco smoke, **UC: Urinary Cotinine

Table 2: Contributing Factors related to Second-hand smoke exposure among Women

Type of Study	Place of Study	Study description	Contributing factors
Cross-sectional study ^[11]	Isfahan, Iran	Included 255 pregnant women as participants who visited the health-care centres.	Lack of awareness about harms from SHS exposure. Lack of knowledge about measures for protection among women. Partial smoking ban leading to smoking at home.
Secondary data analysis ^[15]	Japan	Secondary data from the NHNS and the Comprehensive Survey of Living Conditions (n=2,366,896)	Partial smoking ban increased exposure to SHS significantly in households and workplaces by 2.64 days and 4.70 days per month.
A qualitative study ^[17]	Comilla, Bangladesh and Bangalore, India. Comilla	Interviews were conducted in study participants in Bangladesh and India. Semi structured questionnaire were used as a study tool.	Helplessness among women and a feeling of being not supported by other family members for a smoke free home. Women, husbands and family members do not have adequate knowledge about harms caused by SHS on her and the foetus. Health professionals not providing any information and advice.
Cross-sectional study ^[18]	Bach Mai Hospital, Hanoi in Vietnam	A KAP study about SHS exposure in 432 pregnant women who attended OPD of Obstetrics Department of the Hospital.	Lack of knowledge. Awareness of SHS's harms regarding peptic ulcers, sexual dysfunction, risk of cardiovascular diseases, or various cancers was very low. Knowledge about long term peri-natal SHS exposure was found low.
Cross sectional study ^[19]	University hospital in Riyadh, Saudi Arabia	Study conducted on 1182 postpartum women related to their knowledge on effect of SHS exposure	Lack of knowledge related to specific effect on foetus due to SHS

It was, therefore, suggested to have a comprehensive ban policy.^[15]

Women and children of developing countries are at increased risk of exposure to second-hand smoke due to factors like varying gender prevalence of smoking, more time spend by women and children at home compared to males and poorly ventilated housing condition.^[16] Women from weaker socio-economic sections were more likely to experience tobacco smoke exposure as concluded in the study done in Bangladesh by Florian Fisher in the year 2011.

Effects on maternal and child health

It is a known fact that smoking has harmful effects on maternal and fetal health due to diffusion of nicotine into fetal blood, breast milk and amniotic fluid and its negative effect on neurological development.^[5,20] As maternal and Child health indicators are already adverse, SHS adds more to this by being associated with increasing the risk of miscarriage, congenital malformations and stillbirths, lower mean birth weight, heart disease, lung cancer and maternal depression. A systematic review (2019) had raised a concern over the probable association of SHS exposure with stoppage of breastfeeding before completion of 6 months.^[20]

What can be done?

Lian Yang *et al.* (2015) in China during their randomized control trial suggested interventions such as group educational sessions, standardised advice from primary health-care physicians or brief follow-ups every month to reduce second-hand smoke exposure.^[21] Another community-based research in India claims that initiative for a home free from passive smoke relies on the collective efficacy.^[14] To design interventions, which can reduce the exposure of second-hand smoke an in-depth understanding and knowledge of various factors like social and cultural, is required.

Suggestions, as offered in Table 3, can help primary care physicians to intervene according to associated factors and reduce

passive smoke exposure in their patients. Some interventions like counselling and health education about harms of SHS can be introduced as a part of routine advice during antenatal visits to physicians.

Second-hand smoke and COVID-19

According to the “Global Adult Tobacco Survey”, (2016–2017) India, the percentage of pregnant women exposed to Second-hand smoke is 37.7% at home, 21% at work and 25.9% at any public place. However, these numbers will be increasing due to nationwide corona virus-induced lockdown which started from 24th March and is extended till date as a preventive measure for COVID-19. It’s important to protect those who do not smoke, especially women who are pregnant and children from exposure to SHS during this time when everyone is in close quarters with family and others.

Conclusion

There are various factors like lack of self-efficacy, lack of awareness, cultural and social barriers behind a smoke-free home for a pregnant woman. A comprehensive ban on smoking should be enforced. There is need for behavioural interventions, community awareness and women empowerment. Recognising the high prevalence of SHS among pregnant women in pandemic era, primary health-care physicians must assess the women for SHS exposure and provide focussed counselings to couples during every antenatal visit. Husbands who are active smokers should be counselled for harms to people surrounding them due to SHS exposure, and motivate them to quit smoking.

Key Message

Second-Hand smoke exposure is already prevalent in pregnant women and due to movement restrictions imposed by pandemic COVID-19, SHS exposure might had increased tremendously. Therefore it’s important for health-care professionals to include the education and counseling regarding harm and preventive measures during antenatal visits.

Table 3: Suggestions by various studies conducted according to associated factors for Second-hand smoke

Study description	Factor	Suggestions
255 pregnant women who visited the health-care centres ^[11]	The most important predictors of self-efficacy are barriers perceived personally by pregnant women.	Training programs should be developed to enhance self-efficacy. Education and information should be provided regarding SHS and protective measures. A law for smoking at home should be in place.
Using data from the NHNS* in 2010, 2013, and 2016 ($n=30,244$) and the Comprehensive Survey of Living Conditions (CSLC) from 2001 to 2016 ($n=2,366,896$) ^[22]	There was an increase in SHS exposure in households and workplaces by 2.64 days and 4.70 days per month, respectively after implementation of partial bans.	For protection of non-smokers from SHS, a comprehensive ban will be helpful.
Compared a prenatal health education intervention with usual clinical care as a control Intervention ^[21]	Low awareness of harm related to SHS	An intervention included large group educational sessions, standardized clinician advice, brief monthly follow-up calls. A standard protocol can be prepared for care of pregnant women in hospital setting using this intervention.
Counselling as an intervention in 47 pregnant women in experimental and 46 in control group. ^[23]	Perception related to harmful effect of smoking	Counselling as Intervention is effective in increasing knowledge, awareness by reforming the perception about harms caused by Second-hand smoke.

*NHNS: National Health and Nutrition survey.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Tobacco [Internet]. [cited 2020 Feb 7]. Available from: <https://www.who.int/news-room/fact-sheets/detail/tobacco>.
2. Tong VT, Morello P, Alemán A, Johnson C, Dietz PM, Farr SL, *et al*. Pregnant women's secondhand smoke exposure and receipt of screening and brief advice by prenatal care providers in argentina and uruguay. *Matern Child Health J* 2015;19:1376-83.
3. Abraham M, Alramadhan S, Iniguez C, Duijts L, Jaddoe VW, Dekker HT, *et al*. A systematic review of maternal smoking during pregnancy and fetal measurements with meta-analysis. *PLoS One* 2017;12:e0170946. doi: 10.1371/journal.pone.0170946.
4. Simons E, To T, Moineddin R, Stieb D, Dell SD. Maternal second-hand smoke exposure in pregnancy is associated with childhood asthma development. *J Allergy Clin Immunol Pract* 2014;2:201-7.e3.
5. Quy Ngo C, Thu Phan P, Van Vu G, Thi Chu H, Thi Nguyen T, Hong Nguyen M, *et al*. Prevalence and sources of second-hand smoking exposure among non-smoking pregnant women in an urban setting of Vietnam. *Int J Environ Res Public Heal* 2019;16:5022.
6. Khapre MP, Meshram RD, Mudey AB, Wagh V. KAP study on second hand smoke among pregnant mothers attending tertiary care rural hospital. *Indian J Public Heal Res Dev* 2014;5:204-7.
7. Ministry of Health & Family Welfare Government of India. Global Adult Tobacco Survey 2016-2017[Internet]. International Institute for Population Sciences; 2017. Available from: <https://mohfw.gov.in/sites/default/files/GlobaltobacoJune2018.pdf>.
8. Mistry R, Dasika A. Antenatal Tobacco use and secondhand smoke exposure in the home in India. *Nicotine Tob Res* 2018;20:258-61.
9. Agrawal D, Aggarwal A, Goel S. Women exposed to second-hand smoke more at home than at workplace: An analysis of GATS Report, India, 2009-10. *J Fam Med Prim Care* 2015;4:293-7.
10. Hikita N, Haruna M, Matsuzaki M, Sasagawa E, Murata M, Oidovsuren O, *et al*. Prevalence and risk factors of secondhand smoke (SHS) exposure among pregnant women in Mongolia. *Sci Rep* 2017;7:1-8. doi: 10.1038/s41598-017-16643-4.
11. Mahmoodabad SS, Karimiankakolaki Z, Kazemi A, Mohammadi NK, Fallahzadeh H. Exposure to secondhand smoke in Iranian pregnant women at home and the related factors. *Tob Prev Cessat* 2019;5:7.
12. Mohebi S, Parham M, Sharifirad G, Gharlipour Z. Social Support and Self-Care Behavior Study 2018:1-6.
13. Singh RJ, Lal PG. Second-hand smoke: A neglected public health challenge. *Indian J Public Health* 2011;55:192-8.
14. Ministry of Law and Justice. COTPA 2003 [Internet]. 2003 [cited 2020 Sep 30]. Available from: <https://www.tobaccocontrollaws.org/files/live/India/India-COTPA-national.pdf>.
15. Sen zeng, Haruko naguch sitoru shimokawa. 2019 Partial smoking ban and second hand smoke exposure in japan. *Int. J. Environ. Res. Public Health* 2019, 16(15), 2804; <https://doi.org/10.3390/ijerph16152804>.
16. Kadir MM, McClure EM, Goudar SS, Garces AL, Moore J, Onyamboko M, *et al*. Exposure of pregnant women to indoor air pollution: A study from nine low and middle-income countries. *Acta Obstet Gynecol Scand* 2010;89:540-8.
17. Jackson C, Huque R, Satyanarayana V, Nasreen S, Kaur M, Barua D, *et al*. "He doesn't listen to my words at all, so i don't tell him anything"—A qualitative investigation on exposure to second-hand smoke among pregnant women, their husbands and family members from rural Bangladesh and urban India. *Int J Environ Res Public Health* 2016;13:1098.
18. Van Vu G, Quy Ngo C, Thu Phan P, Phuong Thi Doan L, Thi Nguyen T, Hong Nguyen M, *et al*. Inadequate knowledge, attitude and practices about second-hand smoke among non-smoking pregnant women in urban Vietnam: The need for health literacy reinforcement. *Int J Environ Res Public Health* 2020;17:3744.
19. Al-Shaikh G, Alzeidan R, Fayed A, Mandil AA, Marwa B, Wahabi H. Awareness of an obstetric population about environmental tobacco smoking. *J Fam Community Med* 2014;21:17-22.
20. Suzuki D, Wariki WM, Suto M, Yamaji N, Takemoto Y, Rahman M, *et al*. Secondhand smoke exposure during pregnancy and mothers' subsequent breastfeeding outcomes: A systematic review and meta-analysis. *Sci Rep* 2019;9:8535.
21. Yang L, Tong EK, Mao Z, Hu TW, Lee AH. A clustered randomized controlled trial to reduce secondhand smoke exposure among nonsmoking pregnant women in Sichuan Province, China. *Nicotine Tob Res* 2016;18:1163-70.
22. Zeng S, Noguchi H, Shimokawa S. Partial smoking ban and secondhand smoke exposure in Japan. *Int J Environ Res Public Health* 2019;16:2804.
23. Wahabi HA, Massis A, Fayed AA, Esmaeil SA. Effectiveness of health education in reducing secondhand smoke exposure among pregnant women visiting the antenatal clinic in Saudi Arabia: A randomized controlled trial. *Indian J Public Health* 2020;64:102-8.