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# Exposure to second hand smoke: a survey of pregnant women visiting selected tertiary care hospitals of Peshawar

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## ABSTRACT

**Introduction:** Second hand smoke (SHS) is reported to cause 890,000 deaths per year worldwide. It is also a known cause of serious complications in pregnancy. The current study intends to fill in some of the knowledge gap for further research & effective public health interventions.

**Objectives:** To estimate the frequency of SHS and assess awareness about it among pregnant women visiting tertiary care hospitals of Peshawar.

**Methodology:** A descriptive cross-sectional study was conducted at four tertiary care hospitals of Peshawar from 1st January to 1st March, 2018. Non-probability serial sample of 410 pregnant women was taken. A structured questionnaire was used to collect data. Data were analysed using SPSS version 22.

**Results:** The mean age of 410 pregnant women was 21 ± 4.0 years; 149(36.3%) of the subjects were exposed to SHS, highest frequency (49%) being in age group 26-35 years. Exposure to SHS was highest (39%) among illiterate ladies. Most (92%) of the subjects were exposed to SHS at home, the main source being their husbands (45.8%); 40.7% of the subjects were aware of adverse effects of SHS on the fetus, younger ($p$= 0.01) & more educated women ($p$<0.001) being more likely to be aware.

**Conclusion:** Exposure to SHS among pregnant women is a public health concern in Peshawar. It is more likely among younger & less educated women as well as among housewives. Majority of the pregnant women are unaware of the hazards of SHS while younger and educated women are more frequently aware about these.

**Keywords:** Tobacco Smoke Pollution; Smoking; Pregnant Women; Awareness; Congenital Anomalies.

*The authors declared no conflict of interest. All authors contributed substantially to the planning of research, data collection, data analysis, and write-up of the article, and agreed to be accountable for all aspects of the work.*

## INTRODUCTION

When smoking, all of the smoke is not inhaled; in fact, most of it goes into the air for any nearby person to breathe in involuntarily. This is called Second Hand Smoke (SHS) which is a mixture of smoke from not only the burning end of a cigarette but also the smoke breathed out by smokers.[1] It is known to contain more than 7,000 chemicals.[1,2] Out of these together, hundreds are teratogens and carcinogens.[2,3] Second hand smoking is breathing someone else's cigarette smoke for at least 15 minutes per day and for at least 3 days a week.[4] It is reported that 40% children, 33% male non-smokers and 35% female non-smokers are exposed to SHS globally.[5] An estimated more than 600,000 death per year occur due to second-hand smoke which is more than 1% of all global deaths; 165,000 of the victims are children.[6] Out of these total deaths, 47% occur in women, 28% in children, and 26% in men.[6] An estimated 2.5 million Americans have lost their lives to SHS since 1964.[3]

Most deaths related to SHS exposure are caused by ischemic heart disease in adults, followed by lower respiratory tract infections in children, and asthma in adults. The burden of disease from SHS exposure assessed by disability-adjusted life years (DALYs) lost, lists lower respiratory tract infections among children as the most prominent.[6] It is also established that those exposed to SHS are at 30% higher risk for lung cancer and many other types of cancers.[6] Almost half of the total burden attributable to SHS exposure is borne by southeast Asia and the western Pacific. However, a high burden of disease is also estimated in Eastern Europe, Africa, and Eastern Mediterranean region.

Women and children disproportionately suffer negative health outcomes of SHS. Women are 50% less likely to be smokers themselves yet they suffer more due to SHS. Pregnant women are exposed to many risk factors associated with maternal and infant mortality and morbidity.[7] SHS is one of the preventable causes of adverse outcomes of pregnancy.[8,9] Maternal smoking during pregnancy whether first-hand or second-hand is associated with detrimental effects on mother and infant including stillbirth, preterm birth, small for gestation babies, and Sudden Infant Death Syndrome (SIDS).[10-12]

Meconium analysis indicates that nicotine metabolite concentration in infants of SHS is same as in infants of active light smokers.[5] In developing countries, little attention has been given to such an important public health issue and the available data are largely deficient. SHS has been a neglected research area in general in Pakistan and most of the useful evidence comes from Global Adult Tobacco Survey (2014) conducted by WHO.[13] The survey found that about 7 in 10 adults (16.8 million adults) are exposed to tobacco smoke at the workplace while 5 in 10 (56.3 million adults) are exposed at home. In spite of the known preventable complications of SHS exposure during pregnancy in terms of maternal and fetal mortality and morbidity, it has not received the much needed focus. Data in general, and addressing SHS and women's health in particular, are very scarce.

The current study was conducted to document the magnitude of exposure to SHS, assess awareness about it, and explore some of the social factors associated with awareness among pregnant women in Peshawar, Khyber Pakhtunkhwa, Pakistan. It is expected to generate evidence that will fill in some of the gaps for further research. Also, the study findings can inform public health professionals in designing effective interventions for the control of second hand smoke among this important population segment.

## MATERIALS & METHODS

The cross-sectional survey was conducted from January 1, 2018 to March 01, 2018 on pregnant women visiting the Gynecology Outpatient departments of two private and two public sector tertiary care hospitals of Peshawar through convenience sampling. The minimum sample calculated by WHO sample predictor was 400. Subjects who were in distress and needed early medical care were excluded.

A structured questionnaire was used to collect data. The questionnaire included three sections. The first section consisted of demographic data, second included questions about exposure to SHS, while the third section explored awareness among participants. A pilot study was carried out at one of the private sector hospitals to refine the tool. The questionnaire was translated in Urdu and Pashto to facilitate the participants.

Ethical approval was taken from Institutional Review Committee. An informed verbal consent was taken from subjects. Formal permissions were taken from the Medical Directors of the concerned hospitals and Heads of Gynecology Department of all four tertiary teaching hospitals.

The study data was entered and analyzed in SPSS Version 21 for descriptive statistics; frequencies and their 95% confidence intervals were calculated. The Chi Square test was used for the comparison of categorical variables considering $p \leq 0.05$ as significant.

## RESULTS

The total number of subjects included in the study was 410. Mean sample age was 21 ± 4 years. Majority of the subjects (52.7%) were in 15-25 years age group, followed by the 26-35 years age group (40.7%). The details of sample characteristics are given in Table 1.

Out of total, 149 women (36.3%) were exposed to SHS; based on age group analysis, the most exposed were in age group 26-35 years (43.7%). Most women were illiterate (40.5%), however the highest contributors to SHS exposure were the Higher Education group (45.7%). Similarly, though 90.2% women were housewives, it was the working women group who contributed the most SHS exposed (60.0%) women in their group. More details relevant to exposure are also shown in Table 1.

**Table 1: Socio-demographic data & exposure to second hand smoke (n=410).**

| Characteristics | | Frequency (%) | SHS Frequency (%) |
|---|---|---|---|
| Age group (years) | 15-25 | 216 (52.7) | 66 (30.5) |
| | 26-35 | 167 (40.7) | 73 (43.7) |
| | 36 & above | 27 (06.6) | 10 (37.1) |
| Educational status | Illiterate | 166 (40.5) | 58 (34.9) |
| | Primary | 75 (18.3) | 27 (36.0) |
| | Secondary | 59 (14.4) | 24 (40.7) |
| | Higher | 35 (08.5) | 16 (45.7) |
| | Informal | 75 (18.3) | 24 (32.0) |
| Employment status | Housewives | 370 (90.2) | 125 (33.8) |
| | Working women | 40 (09.8) | 24 (60.0) |

As given in Table 2, most of the subjects were exposed at home (92%), while the most frequent source of SHS was husbands (45.7%).

**Table 2: Place & source of second hand smoke exposure (n=149).**

| Characteristics | | Frequency of exposure (%) |
|---|---|---|
| Place of exposure | Home | 137 (92.0) |
| | Workplace | 09 (06.0) |
| | Both | 03 (02.0) |
| Source of SHS | Husband | 68 (45.7) |
| | Father / Father in law | 30 (20.1) |
| | Son | 31 (20.8) |
| | Brother / Brother in law | 11 (07.4) |
| | Others / Colleagues | 09 (06.0) |

Among 410 pregnant women, 168(41%) were aware that there are adverse effects of SHS on fetus while 242(59%) either thought that SHS has no harmful effects or had no idea about it. Majority (55%) of the pregnant women who were aware about the hazardous effects of SHS reported the electronic and print media to be the source of their knowledge, this was followed by other sources 49(29%). Lastly doctors were the source of information for only 27(16%) of them.

As shown in Figure 1, when frequency of awareness about hazardous effects of SHS on fetus was compared by age, the women in the youngest age group (15-25 years) were most aware while those of ages 36 years or above were least aware. The difference of frequencies was statistically significant (p=0.01).

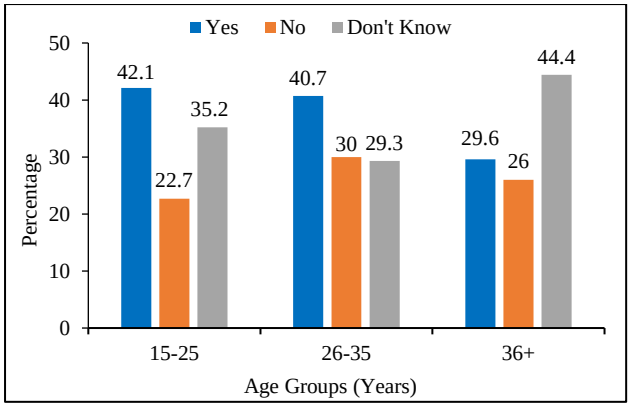


**Figure 1: Awareness about hazardous effects of second hand smoke by age groups of subjects (n=410).**

Frequency of awareness increased with higher education level as evident in Figure 2. The difference of frequency by educational level was also statistically significant (p<0.001).

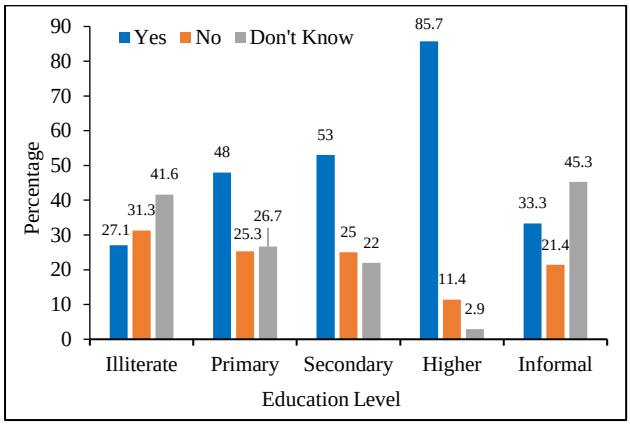


**Figure 2: Awareness about hazardous effects of second hand smoke by education level of subjects (n=410).**

Working women were slightly more aware (43%) about hazards of SHS than the housewives (41%) but the difference was not statistically significant (p = 0.20).

## DISCUSSION

The study is the first survey of its kind to be conducted in Peshawar and focuses on an important but neglected public health issue. It provides baseline data for further researches and much needed public health interventions.

More than 36% of the pregnant women, a considerable proportion, are found to be secondhand smokers. This is not surprising though, as pregnant women in specific are considered as "vulnerable population".[14-15] Furthermore, it may be due to the expected gender inequalities regarding decision making in developing countries like Pakistan.[16] It is important to note that direct comparison of most of the conducted studies on SHS is not justifiable as each one has applied different operational definition of SHS and is conducted in different setting. Still, the reported prevalence of SHS in non-smoking pregnant women in other developing countries in general is similar to our finding.[17] Not surprisingly, our study found that husbands were the source of SHS for most of the pregnant women. The social norms do not allow for not permitting the husband to smoke or avoiding the exposure even if the expecting mother is aware of the hazardous effects on herself and the fetus. This is consistent with the results of studies conducted in countries with somewhat similar social norms, such as India, Malaysia and China.[18-20]

The current study reveals that exposure to SHS is more frequent among pregnant women younger than 36 years, housewives and among less educated women. This could be explained as at a young age Pakistani women may not be empowered enough to take control of their own health due to social norms. Housewives are mostly at home and joint family system still prevails, therefore they are likely to be exposed to SHS at home. Education is related to awareness and empowerment which in turn may help the pregnant women make healthy choices. Studies from other developing countries[18-19] and many developed countries[21-22] have also identified younger age, being a housewife and lesser education as a potential risk factor for exposure to SHS among pregnant women.

Our study shows that only 41% of the pregnant women were aware that SHS has deleterious effects on the fetus. The fact that most of the subjects were illiterate well explains the finding. The finding is supported by studies conducted in India[18] and Saudi Arabia[23] which showed limited awareness about effects of SHS on fetus among the participating pregnant women. Younger women are more aware about the hazards of SHS & this could be because of increasing social media use as a source of information.

The main sources of awareness identified are print & electronic media. The potential role of media for controlling smoking has already been identified,[24] and the current study reconfirms that. The finding that doctors are the least common source of information about the hazardous effects of SHS raises concern and hints at the gap in health education services at healthcare settings in general.

## LIMITATIONS

As the survey was conducted in tertiary care hospitals, it has limited generalizability. Also, as the exposure to SHS was self-reported by the subjects, recall bias is a potential limitation of the study.

## CONCLUSION

The study confirmed that SHS among pregnant women is a major public health issue of concern in Peshawar. The most frequent source of SHS are husbands. It is more frequent among younger, less educated and unemployed women. Majority of the women are unaware of the potential harmful effects of SHS on fetus.

## RECOMMENDATIONS

It is recommended to conduct larger population-based and more generalizable studies. Public health awareness campaign should be launched via media. Health education and counselling of couples & families by healthcare professionals at all healthcare levels and settings should also be ensured to address this growing concern. Health and education sectors need to effectively collaborate to bring a conducive social change for a long term solution of this public health menace.

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