Household Exposure to Second-hand Smoke in Pakistan: Can Electronic Media Play a Role?

Muhammad Zubair Tahir

Fana Global Consultancy and Business Ltd, Birmingham, United Kingdom

Correspondence to: Muhammad Tahir, Fana Global Consultancy and Business Ltd, St Agatha’s Road, Birmingham, B8 2TU, United Kingdom. Email: Zubair01pk@yahoo.com

ABSTRACT

Background: Passive smoking is associated with many diseases and plays an important role reduced quality of life and increase in mortality. The aims of the study were to investigate family members smoking frequency and their exposure to second-hand smoke (SHS) inside the households, and to assess the role of electronic media in changing attitudes towards smoking inside the houses.

Methods: The study is based on data from Pakistan Demographic and Health Survey (PDHS), 2012-13, which is a countrywide survey of 12,943 households. The frequency of smoking inside the houses by the family members was retrieved and analysed with information on wealth index and access to mass media (radio and television) within the households.

Results: The study showed that the family members smoked on daily basis inside their houses in more than one-third of households. The richest households, categorised according to economic indicators, had less daily exposure to SHS (27.3%) compared to the poorest households (40.1%). The family members in households that had access to radio had higher SHS exposure (37.7%) than the households with access to television (35.7%). This difference, however, was not statistically significant. Wealth index, radio and television all were associated with frequency of household members smoking inside the house.

Conclusions: Smoking by family members in their households is an important public health problem in Pakistan, which has so far been ignored. Appropriate guidelines and law formulation, their implementation and behavioural change strategies by creating awareness about risks through powerful electronic media messages and community-based programmes can minimise exposure to SHS in households and at public places.

INTRODUCTION

Passive smoking is the exposure to and inhalation of second-hand smoke (SHS) released from a smouldering cigarette or other tobacco-related products like cigar, pipe, bidis. SHS is also known as environmental tobacco smoke (ETS) [1]. It is estimated that about 5000 non-smokers die annually from lung cancer due to ETS contact and inhalation [2]. Asian countries have high exposure to SHS in public places. As a result the concentration of particulate matter (microscopic solid and liquid particles suspended in air having diameter of 2.5 μm or less), and inhalable coarse particles (having diameter of more than 2.5 μm) is also high due to lack of or non-compliance with the smoke-free policies [3].

Regular and sustained exposure to SHS is associated with various ailments that lead to decreased health-related quality of life [4]. Non-smokers exposed to SHS have effects on their prospective memory which involves remembering future goals and activities [5]. Smoke due to the burning of tobacco products weakens the human body’s immunity. This effect is mediated through the decrease in serum concentrations of immunoglobulins, lysozymes, protective natural killer cells [6] and also functional and structural changes in the respiratory ciliary epithelium, lung surfactant protein and immune cells such like neutrophils, lymphocytes and alveolar macrophages [7]. Women and children under five years of age are most vulnerable in the houses where there is daily exposure to SHS.

Passive smoking damages female reproductive organs, and is particularly harmful to the mother during pregnancy. SHS also aggravates asthma and delays chronic infection healing [8,9]. SHS exposure has risk to the life of foetus as in pregnant women the exposure increases the risk of miscarriage by 11% [10]. SHS exposure can also increase the risk of tuberculosis (TB) [11]. This may be one of the reasons that TB burden is the highest in countries where smoking and SHS exposure has been increasing [12]. In addition, exposure to SHS increases the risk of type 2 diabetes mellitus [13-15], vascular inflammation, encour-

MATERIALS AND METHODS

The study is based on data from Pakistan Demographic and Health Survey (PDHS), 2012-13. The data were used with permission from the PDHS organising committee.

Pakistan Demographic and Health Survey

The PDHS 2012-13 was conducted under the authority of the Ministry of National Health Services, Regulations and Coordination (NHSRC) and was implemented by National Institute of Population Studies (NIPS), Pakistan. Pakistan Bureau of Statistics (PBS) and Inner City Fund (ICF) International provided technical assistance for the survey through financial assistance from the United States Agency for International Development (USAID) and Government of Pakistan. The metadata was produced by the World Bank and Development Economics Data Group. The PDHS is part of the worldwide Demographic and Health Survey programme, which is designed to collect data on fertility, family planning, and maternal and child health. The survey was conducted in all regions of Pakistan excluding Azad Jammu and Kashmir (AJK), Federally Administered Tribal Area (FATA), and restricted military and protected areas.

A total of 20 teams, six members in each
team, were organised to collect data. Each team consisted of a supervisor, a field editor, one male interviewer, and three female interviewers. The entire field work for the survey was carried out from October 2012 to April 2013. Briefly, a total of 248 urban and 252 rural clusters were selected, out of which 14,000 households (6,944 in urban areas and 7,056 in rural areas) were selected by systematic sampling technique. Out of the 14,000 households, 13,464 households were occupied and 12,943 households were interviewed. The household response rate was 96%. A nationally representative sample of 13,558 ever-married women in all selected households, and 3,134 ever-married men aged 15-49 in one-third of the selected households were interviewed. This represented a response rate of 93% of women and 79% of men. Due to law and order situation, data collection was not possible in Rajanpur district in Punjab and Dera Bugti in Balochistan. In Tank district (Balochistan) and Mastung (Balochistan), teams had to stop their work due to threats, so two clusters in these districts were only partially completed.

Operational Definitions

a) Dependant Variable:

SHS in household was defined as “exposure to smoke due to the household members smoking inside the house”. The frequency of smoking inside the house was categorised in five groups: never, daily, weekly, monthly, occasionally/less than monthly.

b) Independent Variables:

Wealth index: It was based on the information collected about household assets during the interviews. Five categories were defined based on the household economic indicators: (1) Very poor, (2) Poor, (3) Middle class, (4) Rich, and (5) Very rich. All households were stratified according to these categories.

Mass media exposure: Households were categorised into those "Having radio", and "Having television" at home and this option had two alternative answers: No/Yes.

Data Analysis

SPSS version 21 (IBM, NY, USA) was used for analyses. Categorical variables are presented as frequency and percentage. The relationship between the dependent and independent variables was tested by regression analyses. A p-value of <0.05 was considered to be statistically significant.

RESULTS

Frequency of Smoking within Households

Table 1 shows that in 35.4% of households all non-smoker family members were exposed to SHS on daily basis. Overall, family members smoked inside the house in about 38.5% of the households in a month.

<table>
<thead>
<tr>
<th>Smoking Pattern</th>
<th>Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily</td>
<td>4,585 (35.4)</td>
</tr>
<tr>
<td>Weekly</td>
<td>267 (2.1)</td>
</tr>
<tr>
<td>Monthly</td>
<td>41 (0.3)</td>
</tr>
<tr>
<td>Less than a month</td>
<td>88 (0.7)</td>
</tr>
<tr>
<td>Missing</td>
<td>12 (0.1)</td>
</tr>
<tr>
<td>Total</td>
<td>12,943 (100)</td>
</tr>
</tbody>
</table>

Smoking Frequency by Area of Residence

The frequency of smoking by the area of residence is shown in Table 2. A higher proportion of non-smokers were exposed to SHS on daily smoking by smoking family members in the households based in rural areas compared to those in the urban areas. However, the family members in urban areas households had more SHS exposure in a month than family members of rural areas households.
Table 2. Frequency of Smoking within Households by Residence Area, Wealth Index and Electronic Media Exposure (N = 12,943)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Smoking Patterns within Households by Family Members (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Daily</td>
</tr>
<tr>
<td>Areas of households</td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>32.0</td>
</tr>
<tr>
<td>Rural</td>
<td>38.8</td>
</tr>
<tr>
<td>Wealth index</td>
<td></td>
</tr>
<tr>
<td>Very poor</td>
<td>40.1</td>
</tr>
<tr>
<td>Poor</td>
<td>37.7</td>
</tr>
<tr>
<td>Middle class</td>
<td>39.7</td>
</tr>
<tr>
<td>Rich</td>
<td>35.3</td>
</tr>
<tr>
<td>Very rich</td>
<td>27.3</td>
</tr>
<tr>
<td>Electronic media exposure</td>
<td></td>
</tr>
<tr>
<td>Households with radios</td>
<td>37.7</td>
</tr>
<tr>
<td>Households with TVs</td>
<td>35.7</td>
</tr>
</tbody>
</table>

Smoking Frequency by Wealth Index

Table 2 highlights the smoking prevalence according to family’s wealth index. About 40.1% of people smoked inside households on daily basis in the very poor category households with the lowest daily smoking prevalence of 27.3% in the very rich households. There was, however, no remarkable difference among other households groups based on the wealth index.

Electronic Media Exposure and Frequency of Smoking

There were 2,220 households that had access to radios and 8,267 with access to TVs. The households that had access to radio had 37.7% of family members smoking on daily basis. On the other hand, in the households that had access to television (TV) around 35.7% of family members smoked daily. Overall, there was a higher prevalence of SHS exposure in households having radios than households having TVs (Table 2).

Impact of Mass Media and Wealth Index on Smoking Frequency

As shown in Table 3, wealth index, and access to TV and radio had a statistically significant impact on smoking inside households by the family members.

Table 3. Impact of Exposure to Electronic Media and Wealth Index (IVs) on Smoking Frequency within Households (DV)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Wald Chi Square</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radio</td>
<td>20.717</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Access to radios</td>
<td>56.914</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Access to TVs</td>
<td>180.924</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

IVs - Independent variables; DV - dependant variable
DISCUSSION

The results show that the family members smoke inside the house on a daily basis and all non-smoker family members are exposed to SHS in more than one-third of the households. The richest households, categorised according to economic indicators, have lesser daily exposure to SHS compared to the poorest households. Households having radio were more exposed to SHS than households having TV. Statistical analysis shows that the wealth index, TV and radio have impact on smoking frequency inside the households.

PDHS 2012-13 shows that a household in Pakistan is comprised of about seven persons and a large percentage of Pakistani population (39%) is under 15 years of age. Passive smokers in households are in all age groups with higher risks for the children under five years of age. SHS is more dangerous in smaller and closely-built houses in any area. In rural areas of Pakistan all family members usually live in small houses comprised of one or two bedrooms. This study shows that the family members of 38.5% of households were exposed to SHS. Electronic media, especially TV can play an important role in creating awareness and helping to decrease smoking frequency inside the houses.

Urban areas in Pakistan are exposed to pollution and ETS in addition to the family members smoking inside households, thereby further increasing the SHS levels inside the houses. ETS is a main source of particulate matter indoor pollution and is further augmented with cigarette smoking inside the houses [21,22]. Tobacco smoke contains a wide range of toxic gasses and particles which are injurious to not only the smokers but also to those around them [23].

There are different studies which indicate that exposure to SHS at public places is linked to cardiovascular and pulmonary diseases as well as mortalities. Risks of diseases have been minimised in countries where smoking at public places is legally not allowed. When smokers are allowed to smoke at public places then they are also permitted to damage health of others. In a study in Pakistan, it was found that among the smokers, around 66% smokers smoke at public places [24]. They not only increase the environmental pollution but also put the wellbeing of non-smokers at stake. This careless attitude about others or lack of awareness and information about health hazards needs attention to modify this behaviour.

Cigarette smoke contains harmful chemicals and has adverse effects on almost every organ in the body. There are harmful effects of passive smoking especially on the health of children and pregnant women. According to PDHS 2012-13, large number of under-five children are also exposed to SHS along with their mothers. Passive smoking causes respiratory illness, asthma, poor growth of children along with the development of other chronic infections. This study shows high prevalence of SHS in houses, and children along with their pregnant mothers are at great risks. Exposure to SHS is also associated with childhood TB infection and development of childhood tuberculosis [25,26]. Pakistan is among the seven countries in the world where TB is spreading.

In rural settings in Pakistan, people work in fields, help each other, and sit together in their free time and generally smoke hukka/sheesha, which is part of the social norm. This study shows that the poorest households had higher exposure to SHS than the richest, which may be related to the less recreational activities and more sitting and chatting time. Hence, smoking seems to be time-killing or stress-relieving activity in the poorest households. A study has suggested that hukka use is related to frequency of stressful life events [27]. Hookah/hukka smoking is a community activity in rural areas of Pakistan. People also have no knowledge about its harmful effects as they think hukka smoking is safer than cigarettes due to water in it. Even if someone considers it harmful, he finds it difficult to stop or avoid due to social gathering and peer-pressure. A study reported that a majority of 88% respondents believed hookah/hukka smoking was harmful to their health, but 52% had no intention of quitting it [28]. In hukka smoking activity in houses, the non-smokers are exposed to SHS on an ongoing basis.

The cultural norms in Pakistan have also contributed to exposure to SHS in houses as elders are not asked to stop smoking in houses. Lack of information and knowledge, among active and passive smokers, about health
hazards of SHS is also an important factor. Low education rate, especially in rural areas along with wrong beliefs about hukka smoking as a safer activity than cigarette smoking, are all contributing to health risks due to SHS [29].

Passive smoking seems to be a neglected public health problem in Pakistan. Electronic media - TV and radio - can be used to create awareness, give information about hazards of SHS and passive smoking. In rural areas of Pakistan, radio is a very effective mode to approach the communities and convey messages. People listen to radio programmes and discuss with each other. One radio is usually used to listen to news and programmes by many people from the different households when they sit together or work in fields. Similarly, TV is also shared by families and can be an important source of information and a tool for change in behaviour due to its additional visual power.

Media campaigns by television and radio are usually used for large populations to convey messages. Such media messages can produce constructive changes, minimise effects of negative beliefs and are effective in changing health-related behaviours across large population segments. Along with these messages community-based health promotion programmes and policies can contribute in behavioural change [30]. There is evidence that tobacco control programmes that include mass media campaigns can be effective in changing smoking behaviour in adults and produce positive results even up to eight years after the campaign. The strength and duration of media campaigns, however, does have influence on the outcome [31]. This study shows that households had access to radio and TV, so SHS exposure can be minimised by proper electronic media messages in Pakistan.

There is also a need for innovative interventions to control exposure to SHS in Pakistan. An experimental innovative intervention, Smoke-Free Homes (SFH), was started in Pakistan which involved primary school children, community opinion leaders and health professionals. The intervention had positive effect on the communities’ behaviour, and possibility to influence adult smoking behaviour and decrease SHS in households was noted (32). An important facet is to provide information about health hazards related to SHS in households. Electronic media can change parent’s attitude and health-related behaviours which will control SHS exposure to non-smokers. Avoiding smoking inside the homes by family members and creating smoke-free homes can also serve as a powerful tobacco control strategy for adolescents as well [33].

**CONCLUSIONS**

Smoking by family members in their households is an important public health problem in Pakistan, which has so far been ignored. Appropriate guidelines and law formulation, their implementation and behavioural change strategies by creating awareness about risks through powerful electronic media messages and community-based programmes can minimise exposure to SHS in households and at public places.

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**CONFLICT OF INTEREST**

Author has declared that no competing interests exist.

**REFERENCES**


