



ORIGINAL ARTICLE

Children's exposure to second hand smoke at home: A cross-sectional study in Portugal



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Abstract Second-hand tobacco smoke (SHS) is a major indoor pollutant that causes serious health problems for all exposed, especially children. Children are often exposed to SHS at home, due to parental or other households' or guests' smoking. This study describes Portuguese children's exposure to SHS at home (total and by Portuguese main regions).

In 2010/2011, a questionnaire was applied to a sample of Portuguese children in the 4th grade ($N = 3187$, mean age 9.05 ± 0.7 years, 51.1% male). Descriptive analysis, chi-square tests and crude odds ratios were performed.

Of the participants, 62.9% of those with smoking parents and 19.2% of those with non-smoking parents were exposed to SHS at their home. Parental smoking varied significantly among regions and was significantly associated with children's exposure to SHS at home.

Children's exposure to SHS at home was high, especially if their parents smoke. Children living in Lisbon Region presented the highest SHS exposure rate. The association of SHS exposure with geographic regions suggests the influence of social and contextual factors on smoking behaviour

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and on tobacco control effectiveness. Our findings highlight the need to effectively prevent children's SHS exposure at their home and to develop tailored tobacco control measures by region.

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Introduction

Second-hand smoke (SHS) is the smoke released into the environment mainly by burning cigarette tobacco. It is composed of a complex mixture of thousands of gases and micro-particles, including nicotine and several carcinogens, toxic and irritating substances. In 1992, the U.S. Environmental Protection Agency (EPA)¹ declared SHS as a group A amongst human carcinogens, concluding that there is no safe limit to this exposure. In 2000, the World Health Organization (WHO) European Office published the indoor air quality guidelines also concluding that it is not possible to define a safe limit for SHS exposure.²

Exposure to SHS causes lung cancer and cardiovascular diseases and has a particularly negative impact on pregnancy and on children's health, namely, causing reduced intrauterine growth, spontaneous abortion, preterm birth, low birth weight, sudden death syndrome, ear problems, and respiratory diseases.^{2,3,4}

Children are particularly vulnerable to SHS since they have a less developed airways system and a still immature immune system.^{5,6,7} Prevalence of chronic respiratory symptoms, such as cough, wheezing and dyspnoea, is higher among children exposed to SHS.^{4,7,8} These children have also a greater risk of lower respiratory tract infections (pneumonia and bronchiolitis), asthma attacks, and recurrent otitis media.^{4,5,8,9}

Children's exposure to SHS is quite often the result of the tobacco smoked by their parents at home and/or from permissiveness towards the smoking behaviour of others indoors.¹⁰ Another important risk of this parental behaviour is the proven influence on the likelihood of children becoming smokers in the future.^{11,12}

Despite these consequences, the WHO estimates that worldwide about half of the children (700 million) are exposed to SHS, mainly in their own homes.^{9,13} Two Portuguese studies revealed that 38% and 41% of the children were daily or occasionally exposed to SHS caused by their parents' smoke.^{14–16}

To better prevent children's exposure to SHS we need more information about the parents, other cohabitants and houseguests smoking habits. This study describes smoking habits in Portugal and children's exposure to SHS at home. It was carried out by region to get a more detailed view of the situation and to support decisions on prevention of this risk for children's health.

Material and methods

Study design and sampling procedure

This is a cross-sectional study conducted in the school year of 2010/2011 based on a self-administered questionnaire filled

in by 3187 Portuguese children in the 4th grade (mean age 9.05 ± 0.7 years; 51.1% male).

Convenience and random sampling methods were combined to select the participants of this study. Nine municipalities (Angra do Heroísmo, Braga, Covilhã, Évora, Faro, Funchal, Lisboa, Porto, Viana do Castelo) representing the seven main regions of Portugal (NUTs II: Azores, Alentejo, Algarve, Centre, Lisbon, Madeira and North) were chosen for the sake of convenience. Considering the number of 4th grade students from the nine municipalities as a total population, and estimating that each class has 20 students, a proportional number of classes per each municipality were randomly chosen to participate in the study. The students' response rate per municipality was between 69.2% (Funchal) and 91.9% (Angra do Heroísmo) with an average of 77.5%.

Questionnaire

The questionnaire that was used had been developed and validated for this study. It contained multiple choice questions and four open-ended questions to measure the following variables:

Socio-demographic variables: Age, Sex, Fathers' and Mothers' Education level and Socio-economic level.

Children's exposure to SHS at home: Smoker family members ("does not smoke", "yes, sometimes", "yes, every day" or "I don't know/I do not have any"), Family members and visitors' permission to smoke at home ("does not smoke", "yes, every day", "yes, sometimes" and "does not smoke at home" or "I don't know/I do not have any/does not live in my house") and rules concerning smoking inside the house ("smoking is not allowed in any part of the house"; "smoking is allowed in some parts/rooms of the house"; "smoking is allowed in any parts/rooms of the house" and "smoking is allowed only on special occasions").

Procedure

The project and the questionnaire were approved by the Portuguese Ministry of Education. Once authorization was granted by the Governing Body of each School Group, head teachers were contacted and guidelines were given about obtaining parental or guardian authorization and about administration of the questionnaire. The questionnaires were administered according to a protocol in the classrooms by trained teachers or by members of the project team.

Data analysis

The data gathered were analyzed through the statistical software IBM SPSS Statistics version 20 for Windows.

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