Secondhand smoke (SHS) exposure among children. Implications for a smoke free home educational programme.

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Abstract

Background: SecondHand Smoke (SHS) exposure among children represents a major cause of serious health problems. Children exposed to SHS are at an increased risk of serious health problems like sudden infant death syndrome, pneumonia, ear infections and more severe asthma. Studies have shown that SHS exposure is quite common, occurring frequently at home and in the car. A previous study conducted in Portugal (2002) with 1141 children with 12-15 years old revealed that 38% of them were daily or occasionally exposed to SHS due to the smoke of parents or siblings at home. No information was available for 9-10 years old. **Objectives:** 1) To determine parents smoking prevalence in the sample; 2) To determine the prevalence of parents smoking at home. **Methods**: An anonymous self-administered structured questionnaire was submitted to 793 students (aged media 9.14 years; 48.6% girls; 51.4% boys), enrolled in Portugal's Northern Region' schools. **Results:** 15.5% of the mothers and 37.0% of the fathers are daily smokers; 11.4% of the mothers and 25.8% of the fathers are daily or occasional home smokers. 14,2% of children report that at least one of the co-inhabitants (father, mother, brother/sister or other) smokes daily at home and 28.0% refer they smoke occasionally at home. **Conclusions:** Almost half of the children evaluated are daily or occasionally exposed to SHS, because a high proportion of parents or other people like brother/sister regularly smoke at home. Health professionals, especially Pediatricians, should systematically inquire and advise parents about the health risks of SHS and advise them to quit or even forward to a specialised query.

Keywords: Second-hand smoking; Smoking prevention; Health Education.

Introduction

There is a consistent, robust and consensual evidence that exposure to environmental tobacco smoke is harmful to health at all stages of human beings life (United States Department of Health and Human Services [USDHHS], 2006).

The SHS exposure among is associated with a series of health problems ranging from coughing, wheezing and dyspnea, to a greater risk of acute infections of the lower airways (bronchitis and pneumonia), respiratory infections of repetition and also induction and exacerbation of asthma (USDHHS, 2006).

Despite the seriousness to children's health, studies reveal a high prevalence of children exposed. The World Health Organization (WHO) estimated that in 1999 about half of the children in the world (700 million) were breathing contaminated air by the SHS, especially at their homes (WHO, 1999).

Parents are the primary cause for the exposure of children to environmental tobacco smoke at home. A study of large population (Third National Health and Nutrition Examination Survey, NHANES-III), conducted in the U.S. between 1988 and 1994, with 11728 children aged between 2 months and 11 years, showed that 38% were exposed to SHS, due to their parents smoking; 23% had been exposed to passive smoking during pregnancy and 19% were exposed to both (smoking and gestational SHS) (Lieu & Feinstein, 2002).

A study conducted in England in 1988 (n = 1179) and 1996 (n = 576), with children aged between 11 and 15 years, found that in 1988, 52% of children were exposed to SHS at home and, in 1996, it was registered a slight reduction of this value to 45% (Jarvis, Goddard, Higgins, Feyerabend, Bryant & Cook, 2000).

According to the last report of USDHHS, almost 22 million (60%) of American children, aged between 3 and 11 years, are exposed to the SHS. According to another US study, by the WHO and the Center for Disease Control and Prevention (CDC), with teenagers between 13 and 15 years, belonging to 132 countries, it is estimated that 43.9% of them are exposed to the SHS at home and 55.8% in public spaces (GTSS The Collaborative Group, 2006).

A study carried out in 7th, 8th and 9th grade portuguese students, in 2002/2003 (in a sample consisted of 1141 students from 12-15 years old), showed that 38% were daily or occasionally exposed to environmental tobacco smoke, because their immediate family (father, mother or brother) smoke daily or occasionally at home. Data from this study allow us to conclude that the consumption of tobacco by parents, particularly at home, is a microssocial risk factor, strictly related to the latter consumption of tobacco by children (Precioso, Calheiros, & Macedo, 2005).

Objectives

Despite the seriousness of the passive smoking exposure, there aren't any studies in Portugal about the prevalence of SHS exposure among children aged 7-10 years. That is why this study was held with students of these ages. Its main objectives were: 1) determine the prevalence of smoking fathers / mothers; 2) determine the prevalence of parents, students and other co-inhabitants smoking at home; 3) present a description of the views of students regarding tobacco consumption and secondhand smoke.

Methods

This study is observational and analytical cross kind and it was administered at the end of the academic year 2006/2007. It consisted in the implementation of an anonymous questionnaire for self fulfillment in a sample of 793 students from four grades (among a population of about 2000 students), belonging to 35 primary schools, integrated into five groups of schools of the county of Braga. 48.6% of students were girls and 51.4% were boys. The average age was 9.14, with a standard deviation of 0.65.

This study analysed data collected in schools participating in the, a preventive program aiming to reduce the SHS exposure among children at home.

The questionnaire administered to students was made by 6 multiple-choice questions, which were intended to measure socio-demographic parameters, the students, their parents and others tobacco use, as well as the students' views regarding the tobacco consumption.

The collected data were introduced and analysed using the stastistical package SPSS. To determine the pattern of tobacco consumption of parents of students, especially at home, distributions were made in frequency.

Results

As can be seen by data in Table 1, it appears that 15.5% of the students perceived that their mother smokes and 37.0% that their father smokes. Compared to a study carried out by Precioso and others (2005), with a sample of 1141 students attending the 7th, 8th and 9th grades (3rd Cycle of basic education), in Braga, these results show a slightly below prevalence of fathers / mothers smoking. In the other study, the percentage of students who perceived that their mothers smoked was 17.6%, while 40.1% perceived that their fathers were smokers.

Table 1. Prevalence of smoking mothers and fathers, as stated by the students of the sample.

N (787)

	Smoker				**Non smoker**		
Relative	**n**	**%**	**IC (95%)**	**f**	**%**	**IC (95%)**	**f**
Mother	(760)	15.5	(13,0 – 18,3)	118	84.5	(81,7 – 87,0)	642
Father	(745)	37.0	(33,6 – 40,6)	276	63.0	(59,4 – 66,4)	469

Through analysis of Table 2, we find that 5.1% of students stated that their mother smoke every day at home and 6.3% occasionally. 11.4% of students perceived that their mother smoke daily or occasionally at home. With regard to fathers, 9.2% of students stated that they smoke at home every day and 16.6% occasionally. In summary, 25.8% of students perceived that their father smoke daily or occasionally at home.

Data in Table 2 can also estimate that 42.2% of students are daily or occasionally exposed to environmental tobacco smoke, because at least one of their co-inhabitants (father, mother, brother or other) smoke daily or occasionally at home.

Data from Precioso and others (2005) showed that the percentage of mothers who smoked daily (8.4%) or occasionally (7.2%) at home was higher than in this study. The percentage of fathers who smoked daily (14.4%) or occasionally (16.9%) at home was also much higher than in this study.

Table 2. Prevalence of regular and occasional smokers at home, stated by the students of the sample.

		Daily smoker at home			**Ocasional smoker at home**			**Non smoker or non smoker at home**		
Relative	**n**	**%**	**IC (95%)**	**f**	**%**	**IC (95%)**	**f**	**%**	**IC (95%)**	**f**
Mother	729	5.1	(3,6 – 7,0)	37	6.3	(4,7 – 8,3)	46	88.6	(86,1 – 90,8)	646
Father	727	9.2	(7,2 – 11,6)	67	16.6	(14,0 – 19,6)	121	74.1	(70,8 – 77,3	539
Mother, father or brother/ Sister	774	11.5	(9,3 – 14,0)	89	18.7	(16,0 – 21,7)	145	69.8	(66,4 – 73,0)	540
Mother, father, brother/ Sister or other	793	14.2	(11,9 – 16,9)	113	28	(24,9 – 31,3)	222	57.8	(54,2 – 61,2)	458

As shown in table 3, it appears that 32.2% of students whose mothers smoke report them to smoke every day at home and 34.8% report them to smoke occasionally, which means that 67.0 % of the students with smoking mothers perceive them to smoke daily or occasionally at home. Regarding fathers, 25% of the students whose parents smoke report that they smoke daily at home and 43.7% report they smoke occasionally. So, 68, 7% of the students with smoking fathers perceive them to smoke daily or occasionally at home.

In a study performed by Precioso and others (2005), it was found that 46% of the students whose mothers smoke report that their mothers smoke every day at home and 37% report they smoke occasionally, or around 83% of students perceive their mother to be a daily or occasionally smoker at home. 35% of the children state that their smoking fathers smoke everyday at home and 40% say they smoke occasionally. In other words, 75% of the children of smoking fathers perceive that the father smoke daily or occasionally at home. Comparing these data with that of this study we can conclude that the percentage of mothers and fathers smoking at home is also greater.

Table 3. Prevalence of smoking fathers and mothers, who smoke at home, stated by students.

N(119)

		Daily smoker at home			**Ocasional smoker at home**			**Non smoker at home**		
Relative	**n**	**%**	**IC (95%)**	**f**	**%**	**IC (95%)**	**f**	**%**	**IC (95%)**	**f**
Mother	115	32.2	(23,8 – 41,5)	37	34.8	(26,1 – 44,2)	40	33.0	(24,6 – 42,4)	38
Father	268	25.0	(19,9 – 30,6)	67	43.7	(37,6 – 49,9)	117	31.3	(25,8 – 37,3)	84

Table 4 outlines the views of students in the sample regarding tobacco consumption and secondhand smoke. 99.0% of students think that smoking is bad for

health; 96.8% of students state that if parents smoked at home it would be harmful to their health; 93. 0% of students consider that the attitude of smoking makes people more beautiful and only 1.8% of children think they'll be smoking in the future.

The results in Table 4 are similar to results obtained by Lotufo and Rozov (2006). According to the study carried out by these authors, 98.3% of children think that smoking is bad for their health; 95.5% believe that smokers annoy other people with smoke, 99% do not consider the attitude of smoking as being beautiful and 1.7% think in becoming a smoker in the future.

Table 4. Students' views regarding active and passive smoking.

N(788)

	Yes			**No**			**Doesn't Know / Doesn't Answer**		
Question	**n**	**%**	**IC (95%)**	**f**	**%**	**IC (95%)**	**f**	**%**	**IC (95%)**	**f**
Q7.1	777	1.0	(0,4 – 2,0)	8	99	(98,0 – 99,6)	769	0.0	(0,0 – 0,5)	0
Q7.2	779	0.9	(0,4 – 1,8)	7	96.8	(95,3 – 98,0)	754	2.3	(1,4 – 3,6)	18
Q7.3	774	93.0	(91,0 – 94,7)	720	5.4	(3,9 – 7,3)	42	1.6	(0,8 – 2,7)	12
Q10	788	1.8	(1,0 – 3,0)	14	85.5	(82,9 – 88,0)	674	12.7	(10,4 – 15,2)	100

Legend: Q7.1- Is smoking good for your health? Q7.2– Does smoking makes people more beautiful? Q7.3 - Is smoking bad for your health if your parents smoke at home? Q10 – Do you wish to smoke cigarretes when you grow up?

Conclusions

Data allow us to infer that over 40% of children who attend the 4th grade, in the City of Braga, are daily or occasionally exposed to the secondhand smoke at home, because their father / mother / or other co-inhabitant smokes inside. It is also shown that among smoker fathers and mothers, there are very high percentages who

smoke daily or occasionally at home (67.0% and 68.7 respectively), threatening their health and the others, including their children. Comparing the data of this study with others conducted in our country by Precioso and others (2005), there is a slight decrease in the prevalence of smoking among the parents and consumption at home. Although we consider that more rigorous studies are needed to further characterize the secondhand exposure among children, for example, using biological markers, such as cotinine, we can infer from the evidence expressed in this study that a high percentage of children is exposed to environmental tobacco smoke by the fact that the closest relatives (father, mother or brother) smoke at home.

Taking into account the risks to the health of SHS exposed children, efforts should be made in order to take public health measures to protect this particularly vulnerable population.
The most effective way to protect SHS smoke exposure among children at home is to promote the smoking cessation of parents or at least make them not to smoke at home. **Parents should be the "target" of the main measures of prevention and treatment of smoking.**

The health system combating the secondhand smoking exposure among children

The health system must have a particular role in the diagnosis and treatment of smokers. The following measures, among others, should be engaged to reduce the prevalence of smokers (Becoña, 1995):

1. The assumption by all of the health care professionals (doctors, psychologists, nurses, social workers and so on) of the health risks of smoking.

2. Being aware, it is important that the health care professionals lead by example, stop smoking (if they do) or at least avoid to do so in the presence of their patients. We need health professionals to take on board that they can act as social models for many people. They may constitute themselves as an example in good or bad sense to others, so, they must act responsibly.

3. It is imperative that doctors of various specialties (family doctors, medical work, cardiologists, pulmonologists, obstetricians, pediatricians, nurses, psychologists) are involved in the treatment of nicotine dependence, as it is already

done concerning the control of other risk factors for health (Ministry of Health, 2002). It is important to be aware of the possibility that all patients are able to quit smoking and that there are effective methods to help them. Basically, it is recommended that the WHO guidelines to promote smoking cessation are followed and applied: systematically **address** all users of tobacco in each consultation; **advise** all users to quit; **assess** whether the patient wants to do an attempt to abandonment**; help** the patient in their attempt to abandon; **schedule** follow-up consultations. Portuguese doctors can find detailed information on diagnosis and treatment of smoking in the publication "Ministry of Health (2002): Treatment and Use of Tobacco Dependence: Clinical Standards for Action".

Regarding children, pediatricians should ask parents about smoking; if they are smokers at home and recommend them to stop smoking and especially not to do so at home because it is a way to inflict cruelty to children.

The role of the education system in the promotion of smoking cessation by parents

Schools also have an important role in the prevention of parental smoking especially regarding domestic consumption. Parents of those children attending "Promotion and Health Education" classes should be involved through the Class Director, who shall organize meetings, seminars and other activities at school. The school newspapers are a way to reach parents. Many responsibles for education do not read newspapers or weeklies but certainly read the school publications because they know it may have relevant news on the activities of their children at school. Parents should be sent the message of how important is not to smoke in the presence of their children, not so smoke at home and that they should have a negative attitude toward the possible tobacco consumption by their children. It is also important to monitor their daughters' activities and control the money given. This message can also be passed by the students themselves (children or students) through their involvement in campaigns organized at school, for example, within the subjects of Civics or in the Project Area. It is also a way to teach students how to participate in social life and community. The Associations of Parents should help schools in their preventive efforts organizing awareness sessions for parents of students.

The Household Without Smoke Program / Homes Without Smoke

This program was created in order to protect children from the secondhand smoke at home. It aims to ensure that fathers and mothers do not smoke or do not allow smoking at home and in the car. Basically it consists in training students to protect themselves from this aggression.
In the classroom teachers should develop the following strategies with pupils:

1. A small approach to the resulting problems of active and secondhand smoke (teachers will be given a presentation on the topic).

2. Preparation of small works (letters, leaflets, or basically a sign of not smoking ...) to be sent by school to the smoking parents.

3. To role playing exercises, in which a student plays his/her role of child and another (or the teacher) plays the role of the father, mother or another smoking relative. The child tries to convince the parent not to smoke at home.

4. Sending the parents a leaflet on active and passive smoking.

5. Signing of a declaration between father and son, in which the first is committed to the creation of a home without smoke.

We believe that this program will be a small step for the father / mother smoker and a giant leap in the health promotion of the co-inhabitants.

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