Parent's knowledge and perceptions of the health effects of environmental hazards in Sakarya, Turkey

Pages with reference to book, From 41 To 44

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Abstract

Objective: To assess the knowledge and perception of parents of high school students about the health effects of environmental hazards in Sakarya province of Turkey.
Method: The cross-section study was conducted in May 2009 in which randomly assigned 362 parents answered a questionnaire inquiring about the sociodemographics and a list of environmental hazards such as tobacco smoking, sunlight exposure and skin cancer, global climate change, air pollution, noise exposure, smoking during pregnancy and low birth-weight, exposure to radon and lung cancer, reducing radon, air pollution and cardiovascular diseases, base station and childhood leukaemia, extremely low frequency electric and magnetic fields and brain tumour. The participants were also asked about water pollution, environmental tobacco smoke, air pollution, ozone depletion, exposure to radon gas, soil pollution, noise pollution, formaldehyde related with furniture, ground ozone and pesticides etc. SPSS 15 was used for statistical analysis.
Results: Among the participants 226 (62.4%) were females, and 284 (78.5%) were in the 31-45 age group. There were 246 (68%) high school or university graduates. Of the participants, 357 (98.6%) knew that smoking was a health risk, but exposure to radon gas was not that prevalent (n=194; 53.6%). The most intimidating risk was claimed as unsafe water (n=311; 85.9%), while noise exposure was the least source of worry among the environmental risks (n=134; 37.0%).
Conclusion: There is a necessity to inform the public about less-known but significant environmental risks such as radon gas and noise exposure which may cause health problems.
Keywords: Environmental hazards, Sakarya, Turkey. (JPMA 64: 38; 2014).

Introduction

The impact of global environmental changes on human health and the specific vulnerability of children represent a growing concern for the future. Children are particularly vulnerable to many environmental threats, including a contaminated and unsafe physical environment.[1]
The World Health Report 2002 has underlined that worldwide the attributable fractions for tobacco smoke were about 12% of vascular disease, 66% for trachea bronchus and lung cancers and 38% of chronic respiratory disease and, in particular, among industrialised countries, environmental tobacco smoke causes disease in non-smokers, while urban air pollution is associated with serious health effects.[2,3]
Climate change could harm human health in many ways, including adverse changes in food production, malaria, dengue fever, thermal stress, aeroallergens extreme events, waterborne diseases and other diseases.[4] The elderly, infants, children, and urban poor are expected to be the most vulnerable to the rapidly changing climate.[5,6] Water, sanitation and hygiene are important in protecting people from diarrhoeal and other diseases and small water supplies represent a health risk to people served by them

throughout the world.[7,8]
In spite of these evidences, people's risk perceptions are based on a diverse array of information that they have processed on risk factors, as well as on their benefits and contexts. People receive information and form their values based on their past experiences, communications from scientific sources and the media, from families and peer groups. In a similar way, perceptions of health risks are embedded within different economic, social and cultural environments.[2]
To increase the awareness of community was the crucial stage to reduce the environmental risks.[9] In the Turkish medical literature, we haven't met survey-based studies related to knowledge about environmental risks and hazards among parents and their children. The purpose of the study was to assess parent's knowledge and perceptions of the health effects of environmental hazards in Sakarya, Turkey.

Subjects and Methods

Approved by the Ethical Board at Sakarya University, the study was conducted in May 2009. Written approval was also taken from the local education authority. The sample size was calculated to be 381 with a 5% margin of error, 95% confidence interval, and with an assumed correct response rate of 50%. In order to handle dropouts and sustain the power, it was decided to collect surveys from 500 parents of students who were randomly selected from among two public primary and one private school in Sakarya.
The schools were located in the centre of Sakarya presenting typical demographic characteristics of the region. All parents in the sample received an anonymous self-administered questionnaire, including an explanation about the purpose of the study, advising that they were under no obligation to complete the questionnaire, and explaining that the information obtained would remain confidential.
The first section of the instrument included sociodemographic characteristics (gender, age, education level, marital status, employment status); the second section explored knowledge about 11 risk items: tobacco smoking, sunlight exposure and skin cancer, global climate change, air pollution, noise exposure, smoking during pregnancy and low birth-weight, exposure to radon and lung cancer, reducing radon, air pollution and cardiovascular diseases, base station and childhood leukaemia, Extremely Low Frequency Electric and Magnetic Fields (ELF-EMF) and brain tumour. The third section explored the degree of threat for each of a set of pre-selected environmental 11 risk items: water pollution, environmental tobacco smoke, air pollution, ozone depletion, exposure to radon gas, soil pollution, and exposure to ELF-EMF, noise pollution, formaldehyde related with furniture, ground ozone and pesticides.
All questions about knowledge were on a three-point Likert scale with options for "yes", "no" and "no idea", whereas questions on attitudes had a standard close-ended format with three-point scale response alternatives for each potential environmental risk ranging from "extreme threat", "mild/moderate threat", and "no threat at all".
SPSS v. 15 (trial) was used to analyse the data.

Results

Of the 500 questionnaires distributed, 362 were available for analysis. As such, the response rate was 72.4% (post-hoc power: 100%). Among the participants 226 (62.4%) were females, and 284 (78.5%) were in the 31-45 age group. The proportions of high school (n=132; 36.5%) and university (n=114; 31.5%) graduates were almost equal. Nearly all of them (n=338; 93.4%) were married. More than half of the women (n=151; 66.8%) were housewives (Table-1).

Table-1: Selected characteristics of the study population.

Characteristic	N	%
Gender		
Female	226	62.4
Male	136	37.6
Age group, years		
<30	27	7.5
31-45	284	78.5
46-50	38	10.5
>51	13	3.6
Educational level		
Primary School	64	17.7
Pre-High School	37	10.2
High School	132	36.5
University	114	31.5
Master/Doctora	15	4.1
Marital status		
Married	338	93.4
Others	24	6.6
Employment status		
Housewife	151	41.7
Official	64	17.7
Worker	46	12.7
Self-Employed	84	23.2
Retired	17	4.7

Smoking (n=357; 98.6%) was the most frequently mentioned health risk and the least known factor was exposure to radon gas (n=194; 53.6%) (Table-2).

Table-2: Respondents' knowledge about environmental risk factors and health effects.

	Yes		No idea		No	
	n	%	n	%	n	%
Is tobacco smoking a risk factor for respiratory disease?	357	98.6	5	1.4	-	-
Is solar ultraviolet radiation a possible risk factor for skin cancer?	342	94.5	11	3.0	9	2.5
Is there any role of human actions at the global climate change?	341	94.2	13	3.6	8	2.2
Is outdoor air pollution associated with an increase in daily mortality for chronic respiratory disease?	320	88.4	35	9.7	7	1.9
Is there any relation between tobacco smoking during pregnancy and low birth-weight?	306	84.5	39	10.8	17	4.7
Is continued noise exposure a possible cause of irreversible hearing loss?	300	82.9	52	14.4	10	2.8
Is outdoor air pollution associated with an increase of cardiovascular hospital admissions?	285	78.7	52	14.4	25	6.9
Is exposure to ELF-EMF* increase the risk of brain cancer?	274	75.7	84	23.2	4	1.6
Is living near mobile phones base station increase the risk of childhood leukaemia?	270	74.6	77	21.3	15	4.1
Ways to reduce residential radon gas is a regular ventilate?	241	66.6	110	30.4	11	3.0
Is residential exposure to radon gas a risk factor for lung cancer?	194	53.6	159	43.9	9	2.5

*Extremely Low Frequency Electric and Magnetic Fields.

The most intimidating risk was "unsafe water" (n=311; 85.9%), while noise exposure was the least source of worry among the environmental risks (n=134; 37.0%) (Table-3).

Table-3: Respondents' attitudes toward environmental risk.

Level of fret when thinking of:	Extreme threat		Mild/moderate threat		No threat at all/minimal threat	
	n	%	n	%	N	%
Unsafe water	311	85.9	48	13.3	3	0.8
Outdoor air pollution	311	85.9	49	13.5	2	0.6
Exposure to tobacco smoke (passive smoking)	307	84.8	54	14.9	1	0.3
On-going ozone depletion	307	84.8	48	13.3	7	1.9
Residues of pesticides on vegetables and fruits	283	78.2	70	19.3	9	2.5
Exposure to ELF-ELM	259	71.5	92	25.4	11	3.0
Ground ozone related with dye and adhesive	220	60.8	118	32.6	24	6.6
Soil pollution	217	59.9	128	35.4	16	4.4
Residential exposure to radon gas	214	59.1	123	34.0	23	6.4
Formaldehyde related with furniture	181	50.0	145	40.1	36	9.9
Noise exposure	134	37.0	189	52.2	39	10.8

ELF-EMF: Extremely Low Frequency Electric and Magnetic Fields.

Discussion

The survey demonstrated a complex pattern of knowledge and perception of environmental concerns in the study population. As expected, almost all of them recognised tobacco smoking as a risk factor for respiratory diseases. Bianco et al. defined that tobacco smoking is the first factor among environmental risks which is taken as a hazard to health.[3] Smoking causes 87% of all lung cancer cases.[10] It is thought that education and legislative studies in Turkey about tobacco smoking and its hazards are effective for parents to perceive smoking as the greatest risk factor.

It is found that among the given answers to the question "Is there any relation between tobacco smoking during pregnancy and low birth-weight?", 10.8% said 'no idea', which suggests that there is necessity of generating awareness. Pregnant women who smoke are more likely to have low birth-weight babies which is linked to many infant health disorders and sudden infant death.[10] Karacaaltincaba et al. reported that smoking rates before and after pregnancy were 34.7% and 14%, respectively.[11] Passive smoking was seen in 69.2%. That study showed that tobacco smoking or passive smoking were high during pregnancy.

There is no safe level of exposure to tobacco smoke. Third-hand smoke is residual tobacco smoke contamination that remains after the cigarette is extinguished. Children are uniquely susceptible to third-hand smoke exposure.[12]

Outdoor air pollution was the first priority aspect as a threat to health according to parents in our study which was in concordance with Bianco et al.[3] In a study performed in Turkey,[9] air pollution and ozone layer depletion was emphasised as primary environmental risks. Females tended to be significantly more concerned with environmental issues and this has been reported also in previous studies suggesting a stronger belief in women on the significance of environmental quality on well-being.[3,13,14] Clean air is considered to be a basic requirement for human health and well-being. Individual and population exposure to air pollution is caused by both indoor and outdoor sources. Acute effects are well established for total non-accidental, respiratory, cardiopulmonary and cardiac daily mortality, as well as respiratory hospital admissions.[15] Extreme levels of pollution may cause markedly increased mortality rates.[16] Maître et al. gathered available epidemiological evidence on the association between coronary disease and air pollution at current ambient concentrations.[17]

Tropospheric ozone pollution should be distinguished from the problem of stratospheric ozone depletion, which is linked to global warming and risks of ultra-violet (UV) radiation.[15] Heat exhaustion is the most common heat-related illness. As a result of differences in climate and the prevalence of adaptations such as air-conditioning, heat-related mortality rates can be expected to vary among cities. Prolonged exposure to high temperatures can cause heat-related illnesses, including heat cramps, heat syncope, heat exhaustion, heat stroke, and death.[18-21]

The question, "Is residential exposure to radon gas a risk factor for lung cancer?", has been found as the lowest risk among environmental and health risks by the parents. The rate (43.9%) of the answer "I have no idea" for the question was too high. Again it is determined that 34% of participants considered exposure to radon as a medium-level risk factor. Both results implicate the need of education and information about radon gas and its hazards. In a study, the rate of parents who had no idea about radon was found to be as high as 35.5%.[3] Cigarette smoking is the most common cause of lung cancer. Radon represents a far smaller risk for this disease, but it is the second leading cause of lung cancer in the United States. Scientists estimate that approximately 15,000 to 22,000 lung cancer deaths per year are related to radon. Although the association between radon exposure and smoking is not well understood, exposure to the combination of radon gas and cigarette smoke creates a greater risk for lung cancer than either factor alone. The majority of radon-related cancer deaths occur among smokers.[22]

Environmental tobacco smoke has recently received considerable publicity and an extensive public health campaign has been carried out by the Ministry of Health conducting prohibition of smoking from all public places, whereas radon gas, the second leading cause of lung cancer, is not subject to much attention by the media and the public.[3]

Noise pollution was the lowest factor declared to as a health threat among environmental risks by the parents. In earlier studies, noise pollution was declared as the lowest risk as well.[3,9] Even though noise pollution is a significant environmental problem in the modern world, it is mentioned in various studies as the least known type of pollution in Turkey.[23,24]

As for the limitations of this study, it was conducted among high school students' parents. Thus it is highly possible that the results do not represent the whole population of Sakarya province. The study population had a relatively high education level.

Conclusion

Parents, who hold an important responsibility to protect their children's health together with their own, knew some environmental health risks, but some of the most significant environmental health risks were not widely known and the health threat was under-rated. There is a necessity to inform the public about the less-known but significant environmental risks which may cause health problems.

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