The WHO Green Page – Assessment of the Environmental Health Risks in Children

Donata Kurpas1,2, Joseph Church3, Bożena Mroczek4, Anna Hans-Wytrychowska1 and Zbigniew Rudkowski1,2,5

1 Family Medicine Department, Wroclaw Medical University, Poland
2 National Vocational Medical Higher Education School in Opole, Poland
3 Board of Supervisors, Roanoke County, USA
4 Public Health Department, Pomeranian Medical University in Szczecin, Poland
5 National CEHAPE Programme Coordinator, WHO; Institute of Occupational Medicine and Environmental Health, Poland

Abstract

Background: The objective of this study was to assess the possibility of implementation of the WHO Green Page as a tool to supplement basic medical interviews with environmental health risk factors for children.

Methods: The WHO Green Page questionnaire was tested on parents of children who visited family practice doctors.

Results: A total of 159 parents took part in the study. It was noted that 24.3% of caregivers expressed concern about their children’s environment without naming the risk factors. It was also found that 23.7% of the parents demonstrated knowledge and awareness of existing real environmental risks, and 7.0% of them stated that their children had sustained injuries in connection with road traffic prior to the questionnaire study.

Conclusions: The WHO Green Page will provide additional information to the basic medical interview and, if regularly updated, will allow for monitoring of changing environmental conditions of children.

Key words: The WHO Green Page, assessment, environmental health risks, children

Introduction

According to the WHO, over 3 000 000 children under the age of five die each year due to causes related to environmental risk factors1-3. Identification of recognized environmental health risk factors is considered to be one of the most important objectives of health policy, as it relates to the everyday work of medical health-care professionals including family doctors, pediatricians, and nurses. Determination of mentioned risk factors will allow implementation of proper preventive measures, and a system of providing parents and teachers with information about health risks will, in turn, decrease the risks3-4 which may improve the effectiveness of health care5-7.

The WHO Green Page questionnaire was designed as a potential tool to determine and monitor children’s environmental conditions in all places where they live and develop. It can be a valuable source of supplemental information acquired in the course of children’s and parents’ appointments with family physicians, and it may also be a great support for doctors in determining children’s environmental risks at home and school8.

The WHO Green Page questionnaire has not yet been analyzed in terms of its practical utility with respect to medical diagnostics.

The expected goal of this research was to assess the possibility of implementation of the WHO Green Page as a tool to supplement basic medical interviews with potential environmental health risk factors for children and determination of real risk factors currently existing in home and school environments.

Methods

The WHO Green Page questionnaire was implemented with parents of children from urban, suburban, and rural environments who visited a family practice doctor. Parents who agreed to participate in the study signed an informed consent form. Questionnaires were given to 250 parents to complete after visiting the GP practice. Due to exclusion of
questionnaires missing the majority of data (more than 50% of the answers were missing), the responses of 159 patients were analyzed. When we analyzed the questionnaires with less than 50% of the questions unanswered, the denominator for percentage calculation was lower than that for the 159 parents.

STATISTICA 9.1 was used for statistical analysis. The distribution type for all variables was determined. The Shapiro–Wilk test was carried out. For measurable (quantitative) variables, arithmetic means, and standard deviations were calculated, while for qualitative variables, the frequency (percentage) was determined. The analysis of qualitative variables was based on contingency tables and the $\chi^2$ test. To compare quantitative variables in two non-related and related groups, the Wilcoxon matched pairs test was used, respectively. The Kruskal–Wallis test was conducted for means of variables that did not meet the criteria for variance analysis. The critical level of significance was assumed to be $p<0.05$.

Results

In total 159 parents took part in the study, including 87 parents of girls (58% of the examined) and 63 parents of boys (42% of the examined). The average age of the children was 11.2 years (SD 6.2, median 11). The children mostly lived with both parents (91.3%, 136), while 6.7% (10) of them lived with their mothers only. The majority of the examined cases came from urban areas (56.2%, 87), while 38.3% (59) and 5.2% (8) were from rural and suburban areas respectively ($p<0.05$). The sex distribution was similar in all environments ($p<0.05$). Overpopulation at home was noted only among 4.4% (7) of the respondents. No dependence on the child’s place of living was observed ($p>0.05$).

Domestic animals were present around the homes of 74.5% (117) of the respondents, and the distribution of answers was statistically significant ($p<0.05$), as it relates to the child’s place of living. Contact with domestic animals was predominant in rural areas (animals were present in 91.53% of cases) as opposed to urban and suburban areas (63.95% and 57.14% respectively; $p<0.05$).

It was noted that 24.3% (34) of caregivers expressed concern about their children’s environment (vs 75.7%, 106), which did not maintain statistically significant dependency with the children’s living environment ($p>0.05$). Knowledge and awareness of particular existing environmental risks were noted in 23.7% (32) of the subjects.

Most of the respondents (96.2%, 153) were aware of the presence of disease-transmitting factors: 42.5% of the subjects knew disease-transmitting factors. The distribution of the answers to this question was dependent on the children’s living environment – it was distinctively different in rural areas (disease-transmitting factors were identified by 64.3% of the examined) as opposed to urban and suburban areas (correct answers were given by 31.4% and 33.3% the examined respectively), $p<0.05$.

In addition 7.0% (11) of the surveyed stated that their children had sustained injuries in connection with road traffic prior to the questionnaire study, and one child had sustained injuries in connection with fire. The distribution of the answers to those questions was not dependent on the children’s living environment ($p>0.05$).

Existing exposure to chemical substances (pesticides and detergents) was confirmed by 5.2% (8) of the respondents, and 6.4% (10) of the respondents reported that their children had been poisoned before the questionnaire as a result of contact with chemical substances. Furthermore, 9.6% (15) maintained that there existed a threat from poisonous animals. The distribution of the answers to the questions about contact with chemical substances and threat from poisonous animals was not dependent on the children’s living environment ($p>0.05$).

Following analysis of the respondents’ answers, it was determined that the examined children lived in a densely built-up area in 79.6% (125) of the cases and in a low-risk geographical zone in 76.3% (119) of the cases. The food they ate was of appropriate quality according to 94.9% (149) of the respondents, the indoor air quality was considered to be good by 81.5% (119) of the respondents, and the outdoor air quality was considered to be average by 51.0% (80) of the respondents. Tap water was considered drinkable by 86.5% (128) of the respondents. The land they lived on was seen as appropriate by 72.9% (113) of the respondents, and 92.3% (143) of the examined thought that sewage was disposed of in an appropriate way. Appropriate disposal of waste was confirmed by 87.9% (138) of the respondents, and the noise level was considered low by 68.2% (107) of the examined. Exposure to chemical substances was low according to 70.7% (111) of the respondents. Road traffic was seen as low by 44.6% (70) of the examined (Table 1).

In 60.8% (90) of cases, the children schools were in very well-built areas, and the schools were situated in low-risk geographical zones in 71.3% (102) of cases. The food offered at school was of proper quality according to 94.4% (149) of the examined. Indoor air quality at schools was good according to 64.1% (84) of the respondents, and outdoor air quality was considered to be average by 55.9% (80). Tap water was drinkable according to 82.1% (110) of the surveyed. The land where their schools stand was considered appropriate by 63.2% (91) of the examined, and 88.0% (125) of the examined thought that sewage was disposed of in an appropriate way. Appropriate waste disposal was confirmed by 79.2% (114) of the respondents, and the noise level was considered average by 51.7% (76) of the examined. Explo-
sure to chemical substances was low according to 65.3% (96) of the respondents. Road traffic was seen as moderate by 56.5% (83) of the examined (Table 1).

**Discussion**

The majorities of the children involved in the environmental assessment were of school age, lived with both parents, and came from urban areas. The caregivers expressed minor concerns about the children’s living and study environments as well as low knowledge and awareness of existing environmental risks.

A very low percentage of parents stated that their children sustained injuries in connection with road traffic, and in one case, a child sustained injuries in connection with fire; these were not statistically significantly dependent on where they lived, exposure to chemical substances, or threat from poisonous animals.

Both the places they lived and studied were located in low-risk geographical zones. In the opinions of the majority of the respondents, the food, indoor and outdoor air, tap water, land, sewage and waste, noise level, exposure to chemical substances, and road traffic – were appropriate quality in both places.

This picture is positive and does not fully correspond with reality from the hygienic point of view and after performing an environmental interview⁹, which emphasizes people’s low awareness of environmental risks.

**Conclusions**

The questionnaire may prove to be a useful tool in determining the kind of potential environmental risk factors that exist in children’s living and study places. The WHO Green Page supplements the information of the basic medical interview by being a part the patient’s medical history. It allows for monitoring of changing environmental conditions surrounding a child.

**References**

1. World Health Statistics WHO. 2007. Geneva, Switzerland. World Health Organization. URL: www.who.int/whosis/en/ (accessed: 2009/12).
2. WHO Overview of Child Health and Development. Geneva, World Health Organization, Child and Adolescent Health. URL: www.who.int/child-adolescenthealth/overview/child_health/child_epidemiology.htm (accessed: 2009/12).
3. Cohen A. Achieving healthy school sitting and planning policies: understanding shared concerns of environmental planners, public health professionals, and educators. New Solut 2010; 20: 49–72. [Medline] [CrossRef]
4. Paulson J, Barnett C. Who’s in charge of children’s environmental health at school? New Solut 2010; 20: 3–23. [Medline] [CrossRef]
5. Briggs D. Making a Difference: Indicators to Improve Children’s Environmental Health. Geneva, World Health Organization, 2003.
6. Rogers B, McCurdy LE, Slavin K, et al. Children’s environmental health faculty champions initiative: A successful model for integrating environmental health into pediatric health care. Environ Health Perspect 2009; 117: 850–855. [Medline]
7. Zauli Sajani S, Colaiacomo E, De Maio F, et al. School environment and children respiratory health: the SEARCH project. Epidemiol Prev 2009; 33: 239–241. [Medline]
8. Guide and instructions for the implementation of the Green Page Environmental Health Diagnostics, Draft 28 November 2006. URL: http://www.who.int/ceh/capacity/cehi.pdf (accessed: 2009/12/20).
9. WHO, Environment and Health Performance Review, Poland 2008. URL: www.euro.who.int (accessed: 2010/05/21).

| Table 1 | “ABC” of environmental conditions |
|---|---|---|
| | Home | School |
| | A | B | C | A | B | C |
| Built-up environment | 79.6% (125) | 20.4% (32) | 0.0% (0) | 60.8% (90) | 38.5% (57) | 0.7% (1) |
| Geographical zone | 76.3% (119) | 23.1% (36) | 0.6% (1) | 71.3% (102) | 28.0% (40) | 0.7% (1) |
| Food | 94.9% (149) | 4.5% (7) | 0.6% (1) | 83.5% (111) | 15.8% (21) | 0.8% (1) |
| Indoor air quality | 81.5% (119) | 17.1% (25) | 1.4% (2) | 64.1% (84) | 34.4% (45) | 1.5% (2) |
| Outdoor air quality | 40.8% (64) | 51.0% (80) | 8.3% (13) | 35.0% (50) | 55.9% (80) | 9.1% (13) |
| Water - drinkable | 86.5% (128) | 13.5% (20) | 0.0% (0) | 82.1% (110) | 17.9% (24) | 0.0% (0) |
| Land/soil | 72.9% (113) | 25.8% (40) | 1.3% (2) | 63.2% (91) | 35.4% (51) | 1.4% (2) |
| Sewage disposal | 92.3% (143) | 7.7% (12) | 0.0% (0) | 88.0% (125) | 11.3% (16) | 0.7% (1) |
| Waste disposal | 87.9% (138) | 11.5% (18) | 0.6% (1) | 79.2% (114) | 20.1% (29) | 0.7% (1) |
| Noise | 68.2% (107) | 28.7% (45) | 3.2% (5) | 28.6% (42) | 51.7% (76) | 19.7% (29) |
| Exposure to chemical substances | 70.7% (111) | 28.7% (45) | 0.6% (1) | 65.3% (96) | 32.7% (48) | 2.0% (3) |
| Road traffic | 44.6% (70) | 43.9% (69) | 11.5% (18) | 25.2% (37) | 56.5% (83) | 18.4% (27) |

Environmental risk factors: A, proper; B, average; C, potential. Differences between answers are statistically significant (p<0.05).