

Investigation of Relationship with Health Problems and Environmental Problems in the Silivri District of Istanbul

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Abstract: The purpose of this study is to investigate relationship between health and environmental problems in the district of Istanbul. This study is a cross-sectional questionnaire study that was conducted in the Silivri among the dates of 25th May-24th July, 2015. Questionnaires were conducted from 221 people living in Silivri with face to face interviews by researchers. Most of participants (82.4%) thought the presence of hazardous environmental factors deteriorated their health (n = 182). Water pollution (48.4%, n = 107) and absence of free water (50.7%, n = 112) were the most common complaints of the participants. Analyzing distribution of factors which disrupt health and history of chronic disease to urban and rural areas revealed more complaints about those factors and diseases in the rural areas than urban areas. The most common chronic diseases diagnosed were hypertension (15.8%, n = 35), chronic lung diseases (10.4%, n = 23), diabetes and coronary artery disease. Silivri people reported a lot of environmental problems which impair the public health. People living in villages close to industrial zone and seas which have marine pollution have more history of diseases and report more factors that negatively influence the health than people living in urban area.

Key words: Environment, pollution, health, chronic disease, prevention.

1. Introduction

It is the main duties of public health services to find out the health problems in a region, research the relation of these problems with environmental problems and help them solve [1, 2]. When examining the major environmental issues in a residential area, water and waste management, air pollution, industry, energy production and consumption, the fuel used must be questioned. Water shortages and pollution can lead to various health problems, including infections. Air pollution cause respiratory disease and cardio-vascular diseases. Energy used can be related to water and food contamination and air pollution. Plants grown around thermal reactor lead, copper and zinc have been reported to be detected in high quantities [3]. There are eleven provinces in the Marmara region in Turkey. It is known that the

priority environmental problem in seven provinces (Balıkesir, Bursa, Çanakkale, Edirne, Istanbul, Kırklareli and Tekirdağ) is water pollution. In other provinces of the Marmara region, waste problem (Bilecik, Sakarya and Yalova) and air pollution (Kocaeli) are the major environmental issues. Therefore, the most important environmental problem in the Marmara region is water pollution [4].

Silivri is a port town of Istanbul, located on the coast of Marmara sea. Although Silivri is a port town, the rate of population engaged in fishing is low. In Silivri, a large portion of the land is plain. Fifty-six percent of the agricultural land is in Istanbul. The main means of living is agriculture, stockbreeding, fishing and various industrial branches. There are more than three hundred enterprises engaged in industrial branches that may pose an environmental risk for the district. The main industries in the region are cement, petrol, metal industry, plastics, textile, dye, chemical substances, packaging and food. The share of the industrial sector of the economy in Silivri

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district is 29% [5]. The only company which is able to discharge waste water into the city sewage canal is 53% [6]. Waste waters in the region are discharged into sea from time to time. Also, there is a solid waste transfer station in the district. The population of Silivri is 161 thousand and 165 persons according to the data of Address-Based Population Registration System at the end of 2014. Fifty-four point three percent of the population are male and 45.67% of it are female. Twenty percent of them are under 15 years old, 72.3% are 15-64 years old, and over 7.7% are 65 years old [7, 8]. The objective of this survey is to research the relation of the environmental problems with the health problems in Silivri district of Istanbul.

2. Materials and Methods

Silivri is a district in Istanbul, having a population of 161 thousand people, 22 neighborhood and 13 villages. Assuming that the chronic health problems of the public would be 15%, the sample size was calculated to be minimum 196 at a confidence level of 95% and an error of $\pm 5\%$. The interview was made with 221 people over the age of 18 years. Five villages and five neighborhoods were selected by random sampling. Each village and neighborhood streets were selected by random sampling too. The interview was made with maximum 2 persons from one house along selected streets. The participants from villages and neighborhoods are engaged in the study on an equal basis. The villages are Çayırdere, Fenerköy, Kavaklı, Kurfalı and Akören, and the neighborhoods are Fatih, Alibey, Cumhuriyet, Mimarşinan and Yenimahalle [9, 10].

The survey was carried out between the dates of May 25 and July 24, 2015. Considering the environmental features found from the visits and observations in the region, the interview forms on the environmental problems and health problems was prepared. People in the sample were questioned about their jobs, health problems and environmental problems that they were aware based on face to face interview by the researchers and the nurses. The data were entered into

SPSS 21.0 packet program. For continuous variables, the mean standard deviation was calculated, and for discrete variables, the frequency and rate (%) were calculated. In comparison of the groups, the chi-square test was used for discrete variables. The results were accepted to be at the confidence level of 95% and $p < 0.05$ was accepted to be significant.

3. Results and Discussion

The average age of 221 participants was calculated as 45.86 ± 15.71 . Forty-seven percent of the individuals were female and 53% were male. The average age of women was 43.31 ± 14.62 and the average age of men was 48.06 ± 16.34 . Thirty-six point seven percent of participants were workers and 26% were housewives. The rate of farmers was 6%. Workers mainly worked at the factory and food industry.

The participants' average period of living in Silivri was 34.79 ± 21.75 (min: 3 person, max: 82 person) years, while 91.5% of them lived in Silivri during summer and winter. When the participants were asked about the environmental features of the places close to where they live, the proximity to agricultural areas was found to be 64.7% ($n = 143$) and the coast was 33.9% ($n = 75$). The proximity to the industrial areas was very low in terms of settlement (0.99%). They mainly grow wheat, sunflowers and watermelons as the agricultural product.

The question of "are there any factors in your environment that damage your health?" was answered by 82.4% ($n = 182$) of the participants as 'yes'. Out of the factors listed in the questionnaire, the most damaging factors were as follows: expensive water (50.7%, $n = 112$) and water pollution (48.4%, $n = 107$). Comparatively, least damaging factors were the problem of heating (1.8%, $n = 4$) and the existence of dangerous wastes (2.3%, $n = 5$). The Table 1 gives the rates of environmental problems reported by the participants and its distribution by gender.

When the distribution of health damaging factors in villages and districts is examined, it was seen that

Table 1 Distribution of people reporting health damaging environmental factors by gender.

Health damaging environmental factors		Gender			
		Female		Male	
		n	%	n	%
Water mercenaries	No	50	45.9	59	54.1
	Yes	52	46.4	60	53.6
Frequent water cuts	No	97	45.8	115	54.2
	Yes	5	55.6	4	44.4
Bad business environment	No	102	47.9	111	52.1
	Yes	0	0.0	8	100.0
No sports field	No	90	44.1	114	55.9
	Yes	12	70.6	5	29.4
Smoke	No	81	54.4	68	45.6
	Yes	20	27.8	52	72.2
The stench of interest	No	75	42.6	101	57.4
	Yes	27	60.0	18	40.0
Seawater dirty	No	64	40.0	96	60.0
	Yes	38	62.3	23	37.7
There hazardous waste	No	99	46.0	116	54.0
	Yes	4	66.7	2	33.3
There are factors distorting the overall health	No	19	48.7	20	51.3
	Yes	83	45.6	99	54.4

there were significantly more negative factors in the villages (chi-square = 10.862, p = 0.001). When the distribution of chronic disease histories in villages and districts, the chronic disease history of villagers was found to be significantly more than those living in the districts (p = 0,013, chi-square = 6.185).

The distribution of environmental problems by village and neighborhood is given in the Table 2. The distribution of health problems by village and neighborhood is given in the Table 3. And the distribution of health problems by gender is given in the Table 4.

When the participants were asked about various chronic health problems, the finding of hypertension came to the most (15.8%, n = 35). While the rate of people suffering from chronic lung diseases such as asthma, chronic bronchitis or chronic obstructive pulmonary disease was 10.4% (n = 23). In other respects, serious obesity and cancer were other health problems in this population (2.3%, n = 5 and 0.9%, n = 2, respectively). The rate of those who reported that their children had a chronic disease was 3.6%, (n = 8).

When the potable water habits of participants were questioned, it was seen that they frequently used packaged potable water (58.5%, n = 124). Fifty-seven point five percent of people (n = 46) engaged in agriculture used pesticide. When the people were questioned about their precautions against pesticide exposure, it was found that 82% of them used gloves, 76% used masks and 17% used overalls. When the health problems were compared by work done, the rate of health problems in housewives, retired people, farmers and unemployed people (students and freelancers) was found to be as high as statistically significant ($\chi^2 = 19.425$, d.f = 5, p = 0.002). The average number of people living in the houses of participants was found to be 3.51 ± 1.46 (min: 1 person, max: 10 person), and 59.3% (n = 128) live in detached houses and 40.7% (n = 88) live in apartments. When the participants were asked if they and their families have any health problems, 48.9% of them were found to have a disease history. Thirty-six point two percent of participants reported that they had chronic health problems. Any statistically significant

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Table 2 Distribution of people reporting health damaging environmental factors by settlement.

Health damaging environmental factors		Settlement			
		Village		Neighborhood	
		n	%	n	%
Water mercenaries	No	56	51.4	53	48.6
	Yes	54	48.2	58	51.8
Frequent water cuts	No	107	50.5	105	49.5
	Yes	3	33.3	6	66.7
Bad business environment	No	105	49.3	108	50.7
	Yes	5	62.5	3	37.5
No sports field	No	105	51.5	99	48.5
	Yes	5	29.4	12	70.6
Smoke	No	74	49.7	75	50.3
	Yes	36	50.0	36	50.0
The stench of interest	No	82	46.6	94	53.4
	Yes	28	62.2	17	37.8
Seawater dirty	No	99	61.9	61	38.1
	Yes	11	18.0	50	82.0
There hazardous waste	No	108	50.2	107	49.8
	Yes	1	16.7	5	83.3
There are factors distorting the overall health	No	11	28.20	28	71.8
	Yes	99	54.40	83	45.6

Table 3 Distribution of chronic diseases by gender.

Chronic Diseases		Gender			
		Female		Male	
		n	%	n	%
Hypertension	No	86	46.2	100	53.8
	Yes	18	51.4	17	48.6
Chronic lung disease	No	89	44.9	109	55.1
	Yes	13	56.5	10	43.5
Diabetes	No	96	45.7	114	54.3
	Yes	6	54.5	5	45.5
Coronary artery disease	No	98	46.9	111	53.1
	Yes	4	33.3	8	66.7
Obesity	No	99	45.8	117	54.2
	Yes	4	80.0	1	20.0
Cancer	No	101	46.1	118	53.9
	Yes	1	50.0	1	50.0
Any chronic disease	No	62	44.0	79	56.0
	Yes	40	50.0	40	50.0

relation between the reported risks of environmental factors to health and disease histories could not be found ($\chi^2 = 3.531$; d.f = 1, $p = 0.06$). However, 71 persons out of 80 having a chronic disease reported (88.8%) that there were health damaging factors in their environment. People having a chronic lung

disease reported smoking more than those who don't have. Likewise, people having hypertension reported the lack of sports hall and sea pollution more than those who don't have. Those having a coronary heart disease reported sea pollution and lack of potable water and smoking more than those who don't have.

Table 4 Distribution of chronic diseases by settlement.

Chronic Diseases		Settlement			
		Village		Neighborhood	
		n	%	n	%
Hypertension	No	85	45.7	101	54.3
	Yes	24	68.6	11	31.4
Chronic lung disease	No	97	49.0	101	51.0
	Yes	13	56.5	10	43.5
Diabetes	No	101	48.3	108	51.7
	Yes	9	75.0	3	25.0
Coronary artery disease	No	104	49.5	106	50.5
	Yes	6	54.5	5	45.5
Obesite	No	107	49.5	109	50.5
	Yes	3	60.0	2	40.0
Cancer	No	109	49.8	110	50.2
	Yes	1	50.0	1	50.0
Any chronic disease	No	59	41.8	82	58.2
	Yes	51	63.8	29	36.3

Those having diabetes reported more smoking than those who don't have. Those having obesity reported more poor working conditions than those who don't have. Also, those having cancer reported more sea pollution as environmental pollutants than those who don't have. As known, WHO was associated four non-communicable chronic diseases (diabetes, cancer, cardiovascular diseases and chronic respiratory diseases) with the risk factors such as tobacco use, physical inactivity, unhealthy diet and alcohol [11]. Silivri district is a port and fishing region, and the county has the highest agricultural production in Istanbul and also meets the need for fowls of the city by 87% [9]. In this survey, it was found that approximately 6% of the populations were farmers, 9% were officers and 37% were workers in various industrial branches. About 48% of people interviewed with were not doing an income generating job (housewives, students, unemployed or retired). Since quality of health is heavily depend on social and living conditions, chronic health problems observed in unemployed people rather than employed. More than one third of the interviewers in the study group were the workers whose economic status was medium and low. On the other hand, in the study, people living in villages have more history of diseases

than people living in urban area as in the research by Mitchell R. [12]. The industrial areas, solid waste transfer station and seas which have marine pollution close to these villages can be held responsible from this result. It is remarkable that people complain about dangerous wastes quite a little although there are more than three hundred industrial enterprises. This result makes people think that they are unconscious about it.

4. Conclusions

The results about environmental problems in this survey carried out in Silivri show that the majority of participants are aware of that there are health damaging factors in the environment. The most common diseases were hypertension, chronic lung diseases, diabetes, coronary artery disease, obesity and cancer. These diseases are diseases related to environmental issues as with lifestyle. The most frequently reported health damaging factors are the tap and potable water pollution and that water which is their basic requirement is very expensive. On the other hand, sea water pollution was also reported at a high rate. Usually, rural areas are reputed to be healthier than the cities, because of these areas giving people the opportunity to stay in touch with nature.

But in the survey, it was seen that those living in the villages have significantly more disease histories than those living in the neighborhoods. And those living in the villages reported significantly healthier than those living in the neighborhoods. As industrial zone, livestock and agriculture related health risks could be led this situation.

In the region, approximately two-third of those engaged in agriculture use pesticide and most of pesticide users take precautions. Raising the awareness of people living in Silivri about the dangers of pesticide will further increase the safely use of pesticide. Elimination of health damaging factors, such as rehabilitation of tap water, sea water in order to be protected from diseases, increasing of the number of sports halls and raising the awareness of people about health will improve and enhance the public health. Other suggestions about environmental health are: (1) To prevent water pollution. Untreated domestic and industrial waste waters must be treated with appropriate technologies before discharged into receiving waters. It must be ensure that the pesticides and fertilizers are used at the right time with the proper amount. Nature should be prevented by ensuring proper disposal of spreading pesticide containers. The mixing of the sea and other surface waters of municipal solid waste should be avoided by ensuring regular store. Where the accumulation of animal excrement must be liquid sealed; (2) To prevent air pollution. It should avoid the use of poor quality fuel. Society should be encouraged to the use of environmentally friendly fuels and renewable energy sources (wind power has been used widely in Silivri); (3) To provide an effective waste management, it is necessary to reduce landfill waste by reusing and recycling, also increase the number of sanitary landfills and (4) In addition to all of these, it should be given awareness by training on environmental issues to the society.

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