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Contents

From the Editor

Young people make up the segment of society that has the greatest potential to benefit from policies and health initiatives based on sound research and information. In this issue, we have reserved a considerable place to the researches dealing with the young people's health.

In two of the articles knowledge of young people about contraceptives and HIV/AIDS are being discussed. The data suggest that knowledge gaps remained about HIV/AIDS and individual risk perception is low. One of the findings is that the significant difference between schools as to knowing at least one modern method. School type is being investigated as an important independent variable for the young people in the social distance issue in the case of HIV/AIDS. Stigma and discrimination associated with HIV/AIDS are common around the world and have a profound impact on health. One of the findings of the research is that negative attitudes towards people with HIV/AIDS are common among young people. Interestingly, despite their highest knowledge score, the students in the health high schools have more social distance. This finding suggests that knowledge is not enough in order to gain positive attitudes. On the contrary, the knowledge may have negative effects on social distance towards people with AIDS. The third article deals with health of the young male workers working at wood industry region in Ankara. Results of this study show that unhealthy risk behaviors are particularly important for the disadvantaged groups of working young males by taking working conditions and gender into account.

By taking into account the information provided by these studies on young people's health, we inevitably address restructuring of the curriculum of the formal educational programs. For instance, it is very important that curriculum of the health schools should be reconsidered in terms of positive attitudes and behaviours towards people with AIDS or other diseases.

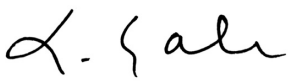
In the article on outdoor noise levels, school environment are being investigated and noise levels is being compared to big cities. The last original article discusses the association between urinary tract infection and functional food products among children.

Short report of this issue introduces us the Izmir Cancer Registry (ICR) which is the first population-based cancer registry of Turkey. Cancer Incidence in Izmir in the years 1993-94, has published as the first cancer incidence rates from Turkey in the year 2001. In the report you will find 1996-2000 results of cancer incidence in İzmir.

The eleventh National Public Health Congress will be held in Denizli, Turkey, during 23-26 October 2007. The main topic of the congress will be "Public Health problems and solutions in 21th Century". More information about the congress is available at the Web Site (http://www.halksagligi2007.org).

We hope you enjoy this issue of the Turkish Journal of Public Health.

Editor



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The Turkish Journal of Public Health (TJPH) is a peer-reviewed research journal published bi-annually and serving a broad audience in the field of Public Health and Community Medicine both nationally and internationally. TJPH aims to provide a medium for the rapid communication of advances and new knowledge in this field. The editor anticipates receiving manuscripts from the following areas of research: health policy and management, biostatistics, epidemiology, environmental health, health economics, medical demography, social sciences for health, health education, public health laboratory, community nutrition, infectious diseases, disaster management, accidents, women's health/reproductive health, child health, chronic diseases, and occupational health.

Submission of Papers

The following types of contributions are welcomed:

1. Original research articles: papers reporting original research findings in a relevant area (maximum 5000 words).
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3. Critical reviews: authors are advised to contact the editor prior to submission of critical review papers (maximum 4500 words).
4. Notes from the field: Highlighting practice-based programs, initiatives of widespread interest, experiences to share with the public health community (maximum 1000 words).
5. Letters to the editor: a limited number of letters to the editor concerning the published papers in the TJPH (maximum 300 words).
6. Data: Data from nationally or sub-nationally representative surveys (maximum 35 tables and figures).

Submissions will be considered on the understanding that they comprise original, unpublished material and are not under consideration for publication elsewhere. A cover letter to this effect should be enclosed with each submission, signed by all authors of the paper.

All papers are published in English although submission of articles in Turkish is encouraged and will not prejudice editorial consideration. The authors may use either the British or the American spelling, but they should be consistent throughout the paper. Submissions undergo a two-tiered review process. The editorial board for overall quality and interest screens them initially. Papers accepted for formal review will be sent anonymously to at least two independent referees.

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Authorship by more than 6 authors requires justification. We adhere to the criteria of the International Committee of Medical Journal Editors (JAMA. 1997; 277:927-934). For manuscripts with two or more authors, each author must qualify by having participated actively and sufficiently in the study that is being carried out and reported on. The inclusion of each author in the authorship list of a report is based only (1) on substantial contributions to (a) concepts and design, or analysis and interpretation of data and (b) drafting the manuscript or revising it critically for important intellectual content; and (2) on final approval by each author of the submitted version of the manuscript. Conditions 1 (a and b) and 2 must both be met. Others contributing to the work should be recognized separately in an Acknowledgement. In the covering letter that accompanies the submitted manuscripts, it must be confirmed that all authors fulfilled both conditions.

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All authors must sign the letter, with one named correspondent (give postal and e-mail addresses and telephone and fax numbers). Disclose all possible conflicts of interest (e.g. funding sources for consultancies of studies of products). A brief indication of the importance of the paper to the field of public health is helpful. You may suggest up to 4 knowledgeable reviewers (include postal and e-mail addresses and telephone and fax numbers).

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The text of the article should include the following: Abstract (up to 250 words, followed by up to 6 keywords), Introduction, Materials and Methods, Results, Discussion, and Acknowledgments. Each section should begin on a new sheet.

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Journal article

Feldman HA, McKinley SM. Cohort versus cross-sectional design in large field trials: precision, sample size, and unifying model. Stat Med 1994; 13: 61-78.

Book

UNICEF. State of the World's Children. New York: Oxford University Press, 1998.

Chapter in a book

Phillips SJ, Whisnant JP. Hypertension and stroke. In: Laragh JH, Brenner BM, editors. Hypertension: Pathophysiology, Diagnosis, and management. 2nd ed. New York: Raven Press; 1995. p. 465-78.

Online book or web site

Garrow A, Winhouse G. Anoxic brain injury: assessment and prognosis. In: Up To Date Cardiovascular Medicine [online]. Available at: www.UpToDateInc.com/card. Accessed February 22, 2000.

Acknowledgements

Prepare acknowledgments on a separate page. Upon acceptance, you will be asked to certify that you have listed all persons who have contributed substantially to the work but who do not fulfill authorship criteria and that you have obtained permission for listing them. Also required is disclosure of all financial and material support. If human subjects are involved, you must report approval by an institutional review board. TJPH adheres to the Declaration of Helsinki of the World Medical Association (JAMA 1997; 277: 925-926).

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Health Perception and Risk Behaviours of a Group of Disadvantaged Young Male Workers: A Gender Perspective

N. Ercument Beyhun[a], Hilal Ozcebe[b], T. Gokhan Telatar[c], Sarp Uner[d]

Abstract

Objectives: The aim of the study is to evaluate the determinants and risk estimates of health perception and risk behaviours in a highly disadvantaged group of young male workers.

Materials & Methods: The study was conducted with the participation 200 (convenience sample) young male workers working at wood industry region in Ankara. The GHQ (General Health Questionnaire) was used to determine the health perception of the participants. To determine the risk behaviours, a structured questionnaire was filled by the investigators by face to face interview technique.

Results: Mean age of participants was 21.5 ± 1.9 and 53.0% of them were graduated from primary school. Seventy-three percent and 50.8% of the workers were current smokers and regular alcohol comsumers, respectively. Low educational status of father 1.8 [1.2-2.8], lack of alcohol consumption 1.3 [1.1-1.7], high work duration at current job 1.7 [1.1-2.8] and high ever work duration 1.6 [1.1-2.4] were determined to increase poor health perception ($p<0.05$ for all).

Conclusion: Health education programmes regarding unhealthy risk behaviours should be provided to disadvantaged groups of working young males by taking working conditions and gender into consideration.

Key words: Disadvantaged young male workers, risk behaviours, gender, culture

Introduction

Young boys, like young girls are a heterogeneous population. Some are faring well in their health and development. Other boys face risks and have needs that may not have been considered, or are socialized in ways that lead to violence and discrimination against women. Gender is only one variable affecting development and health. Social class, ethnicity, local context and country settings are all important variables that interact with gender, to influence health and well-being. WHO estimates that 70 percent of premature deaths among adults are due to behavioural patterns that emerge in adolescence, including smoking, violence, and sexual behaviour[1]. Sexual risk taking is widespread among young adults and typically co-occurs with other psychological health problems[2]. Health risk behaviors contribute to the leading causes of morbidity and mortality among adolescents and extended into adulthood[3]. Risk taking behaviors show attempts to escape from suffering to live. They are different for boys and girls; boys throw themselves against the world in provocative, transaggressive behaviors[4].

Social origin is still the most important factor of successful entrance into adulthood. Social exclusion tends to be more widespread among young people from minorities, among those living in inner city or disadvantaged groups and at rural areas[2]. The adolescents who were working with unsafe working conditions were more at risk to gain unhealthy behaviours. These unhealthy behaviors may resist during adulthood and lead to serious health

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problems like myocardial infarctus at early ages, accidents, suicides, sexually transmitted diseases and injuries. Therefore, the transition from adolescence to young adulthood is an important period to diagnose unhealthy behaviours and explore their pathways.

The aim of the study is to evaluate the determinants and risk estimates of health perception and risk behaviours in a highly disadvantaged group of young male workers.

Materials & Methods

Study design and subjects

The study was enrolled with the participation of young male workers aged between 18-24 who were working at different types of wood industry in Siteler Wood Industry Region, Ankara. This place is the biggest wood industry complex in Turkey which includes approximately 15000 workshops of wood industry. Young male workers in Siteler were generally migrated from different parts of Turkey to survive their life. The study group is a highly disadvantaged group of young workers. The number of workers in Siteler is unknown. There is no source of this type of information, thus we could not use any type of sampling method. We aimed to reach 200 adolescents (convenience sample). A single street in the region was chosen randomly and began to collect data from the respondents who were willing to participate. We continued to collect data from participants until we reached the number.

The questionnaire and data collection

We used a questionnaire consisting of three parts: 1) sociodemographic characteristics of the study group (age, marital status, educational status of themselves and parents, monthly income, health security), 2) unhealthy risk behaviours of young males (smoking, alcohol usage, drug abuse, carrying weapon, unsafe sex, impose physical violence on friends) and 3) General Health Questionnaire (GHQ). Some of the questions regarding unhealthy risk behaviours were presented in Box 1. The data were collected by trained field study staff who were 6th grade medical faculty students. The questionnaires were filled by the students with face to face interview technique.

Box 1. Questions regarding unhealthy risk behaviours

Q1. Have you ever smoked cigarette?
- a. Never
- b. Only tried
- c. Smoked for a while but quit
- d. Regularly smoking

Q2. When did you start smoking? ..... (age)

Q3. Do you consume alcohol?
- a. Yes
- b. No

Q4. Have you ever abused drugs that causes dependency?
- a. Yes
- b. No

Q5. Do you carry any kind of weapon on your body?
- a. Yes
- b. No

Q6. If yes what kind of weapons are they?.....

Q7. Have you ever imposed physical violence?
- a. Yes
- b. No

Q8. Have you ever had sex with sex workers?
- a. Yes
- b. No

Q9. Did you use condom during your last sex?
- a. Yes
- b. No

To determine the health perception of the participants the General Health Questionnaire was used. The General Health Questionnaire was found and improved by Goldenberg at 1972. This questionnaire can be analized as a Likert Scale (4 item) or as a dichotomous scale (0, 1). The dichotomous (dual) type of grading was used by Goldenberg and it was found to be valid with the validity study of Goldenberg and Williams, 1988. The Validity of GHQ-12 was studied by Kilic C. et al. in a Turkish primary care sample in 1997[5]. GHQ-12 was found to be valid and could be used in Turkey.

The pre-survey of the study was conducted with 12 young male workers in another industial field of Ankara which is 30 km away from Siteler.

Statistics

The statistical relations between health perception determined by GHQ and determinants were analized by Pearson Chi-square Test and Fisher's Exact Test. P value under 0.05 was accepted as statistically significant.

Ethical Issues

We obtained the acceptance of the owner of the workshops and the verbal consent of all participants.

Results

Subjects and unhealthy risk behaviours

The distribution of sociodemograhic characteristics and unhealthy risk behaviours of the participants were shown in Table 1.

The mean age of the young adults was 21.5 ± 1.9 (Median=22). Fifty-three percent of the participants were graduated from primary school. Those with no education covered 7.5% of the total. Only 10% of them were graduated from high school. Seventeen percent of the young workers were married. Seventy-eight percent of the participants were living with their families. Fourty-one percent of the workers had a monthly income under 300 US$. Monthly average income was 302.7 ± 79.4 USD and 60.5% of the workers had no health insurance.

Only 7 of them (3.5%) had never smoked. Seventy-three percent of the participants were still smokers. The minimum onset age of smoking was 8. Fifty-two point one percent and 39.0% of young male workers began smoking between the age 12-15 and were planning to stop smoking, respectively. The participants who were regular alcohol consumers was %50.8. Nine point one percent of the young adults were drinking more than once a week and 11.2% of them were drinking up to be totally drunk (binge drinking). Five percent of the participants had ever tried any kind of drugs and 46.5% of the young male workers were carrying some kind of weapon on their body. Those who carried a gun within the last year was 3.5%. Other types of weapons carried by the young workers were different types of blades and knives. The percentage of the participants who superimposed physical violence on somebody with in the last one year period was 30.0%.

Seventy-three point two percent of young adults had sexual intercourse with sex workers within the last one year and 39.4% used condoms during their last sex.

Health perception and its determinants (risk estimates)

The percentage of poor health perception and risk estimates of determinants were presented with Table 2.

The participants who stated that their health status was "fine or very fine" and "poor or very poor" was 75.0% and 25.0% respectively. According to GHQ scale 42.0% of the young adults had poor health perception.

The highest "fine" health perception percents were determined for workers who had a monthly income more than 300 USD and who never abused drugs (80.0% for both); but, this was not statistically significant. Low educational status of father (lower than secondary school) 1.8[1.2-2.8], lack of alcohol consumption 1.3[1.1-1.7], high work duration at current job 1.7[1.1-2.8] and high ever work duration 1.6[1.1-2.4] were determined to increase poor health perception ($p<0.05$ for all).

Discussion

This manuscript achieved to perform the GHQ to screen the health perception of highly disadvantaged young male workers. It was determined that the young workers in the study population had several risk behaviors and these behaviors affect their health perception.

When young adults are asked to report their health status, their responses are likely to be influenced in part by gender norms. In most countries, girls are more likely to be attuned to

health problems, whereas boys may be more likely to ignore them; to diminish their importance, not to report them and not to seek health services when they need them[1]. The young male workers in our study had heavy smoking behaviors, unsafe sexual relations, high alcohol consumption, drug use habit, imposed physical violence and carrying different kinds of weapons. These types of risk behaviors are common at young adults and effect their health status[1, 6-11]. Controversial to the determinants mentioned above, the prolonged ever work duration and work duration at current job were found to effect health perception of young male workers in a bad manner. This may be due to unsafe and heavy work conditions and also the lack of health insurance. The preservation of the occupational rights of

Table 1. Sociodemographics and unhealthy risk behaviors of study population

Sociodemographic characteristics		n	%
Age	≥ 21	129	69.5
	< 21	71	30.5
Marital status	Single	127	63.5
	Married	34	17.0
	Engaged	39	19.5
Education	Illiterate	3	1.5
	Literate	12	6.0
	Primary	106	53.0
	Secondary	59	29.5
	High school	20	10.0
Education of mother*	Illiterate	35	17.5
	Literate	69	34.5
	Primary	82	41.0
	Secondary	3	1.5
	High school	1	0.5
Education of father*	Illiterate	5	2.5
	Literate	24	12.0
	Primary	101	50.5
	Secondary	52	26.0
	High school	13	6.5
Health insurance	Yes	79	39.5
	No	121	60.5
Risk Behaviours			
Smoking	Current smokers	146	73.0
	Never smoked or tried	54	27.0
Alcohol Use	Yes	100	50.8
	No	97	49.2
Drug Use	Current user and tried	10	5.0
	Never tried or used	190	95.0
Carrying weapon	Yes	93	46.5
	No	107	53.5
Impose physical violence	Yes	60	30.0
	No	140	70.0
Ever sex with sex workers	Yes	104	73.2
	No	38	26.8
Condom use at last sex	Yes	56	39.4
	No	86	60.6

* 10 and 5 participants did not know the education of his mother and father's educational status, respectively.

Table 2. Determinants and risk estimates of health perception according to GHQ scale

Determinants	% of subjects with poor health perception	Odds Ratio [95% C.I.]	P
Sociodemographic characteristics			
Marital			
Married / Single	40.9 / 47.1	0.8[0.5-1.3]	0.561
Education			
Lower than secondary / secondary and upper	40.7 / 43.1	0.9[0.6-1.3]	0.774
Education of mother			
Lower than secondary / secondary and upper	42.5 / 35.7	0.9[0.6-1.4]	0.781
Education of father			
Lower than secondary / secondary and upper	50.0 / 27.1	1.8[1.2-2.8]	0.003*
Risk Behaviours			
Income (monthly)			
<300 / ≥300 USD	43.2 / 20.0	2.1[0.6-7.5]	0.197
Alcohol Use			
No / Yes	49.5 / 34.7	1.3[1.1-1.7]	0.045*
Work duration at current job			
≥24 months / 0-24	56.4 / 36.6	1.7[1.1-2.8]	0.016*
Ever work duration			
≥36 months / 0-36	55.1 / 33.6	1.6[1.1-2.4]	0.003*
Drug Abuse			
Current user-tried / Never used	43.2 / 20.0	2.1[0.6-7.5]	0.197
Smoking			
Current smoker / Never smoked and tried	39.7 / 48.1	0.8[0.5-1.1]	0.334
Impose physical violence			
Yes / No	34.8 / 45.8	0.7[0.5-1.1]	0.175
Carrying weapon			
Yes / No	35.5 / 47.7	0.7[0.5-1.0]	0.087
Ever sex with sex workers			
Yes / No	35.6 / 44.7	0.7[0.5-1.2]	0.335
Condom use at last sex			
Yes / No	42.9 / 34.9	1.2[0.8-1.8]	0.379

* Statistically significant

young workers including regular salary, health insurance is a highly important issue of public sector and the Ministry of Labour.

As an interesting result, we determined that the workers who were regular alcohol consumers perceived their health better than workers who did not consume alcohol. Alcohol consumption could be accepted as an escape from the problems of real world and poor health perception may increase alcohol consumption. On the other hand it is also possible that alcohol consumption may lead to overestimation of health status.

It should not be forgotten that this study was an exploratory and descriptive study. The statistical relations determined were cross-sectional relations. The limitation of the study design should be kept in mind when considering the results of the study. One of the limitations was the determination of study sample. Because of the lack of registries regarding number of workers and their gender distribution, we had to assess a convenience sample size. These conditions may result a bit of bias in this study.

It is important to keep in mind cultural variations in the concept of youth. There are major cultural

and urban-rural differences in terms of whether the passage from childhood to adulthood is fairly short and direct, or whether it is prolonged (as in many modern, Western societies) and frequently marked by extended formal schooling and conflicting role expectations, among other common characteristics. In spite of cultural and contextual differences, there is a general consensus that adolescence implies, in addition to new reproductive capacities: 1) an increase in cognitive abilities, and as a consequence, concern over future roles and identity; 2) greater social expectations that the young person contribute to household income, maintenance and production; and 3) social expectations of greater economic independence from the family of origin and/or the formation of a new family unit[1].

The educational status of the young adults in this study was very low and most of them had to work and had social expectations to increase their families' income. In the middle-east countries there is always a social expectation from male young adults; to earn money for their families. Unfortunately this occasion affects their health. It was determined that these disadvantaged male young adults also gained several risk behaviors which were found to effect their health next to earn money. Most of them had no health insurance (60.5%) and worked in heavy working environment. They began to smoke at early ages, had unsafe sexual relations and having risk for sexually transmitted diseases like AIDS (alcohol and other substance use often accompany the early (and later) sexual experiences of young men), had drug addiction and joined in physical fights and imposed physical violence.

The transition of unhealthy risk behaviors from adolescence to early adulthood and from early adulthood to all life is an important issue. The screening of risky population like the groups in our study was essential to promote the health status of disadvantaged groups. This study showed that health education and promotion programs should be provided to disadvantaged groups by taking cultural variation, roles of gender into account[12]. High parental support which can be easily available in Turkish families and parental monitoring during adolescence were related to greater self-esteem and lower risk behaviours[13]. The heavy working conditions and occupational rights of young workers should be preserved by governments. Besides these preventive actions, the governments have to perform programmes attempting to take account the gender and diversity - of the different needs and experiences of young men, especially those who belong to disadvantaged groups in their society[14, 15].

Conclusions

This disadvantaged group of young male workers who had to work to survive under heavy conditions had several unhealthy risk behaviors which affected their health perception in a negative manner. Health education programs regarding unhealthy risk behaviors should be provided to disadvantaged groups of working young males, by taking working conditions and gender into account.

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Risk Perception, Knowledge, and Social Distance of Turkish High School Students about HIV/AIDS: A Cross Sectional Study

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Abstract

Objectives: The aim of the study was to evaluate risk perception, knowledge, and social distance of the students about HIV/AIDS.

Methods: In this cross-sectional study, a total of 1410 students were selected from six high schools in two provinces. In 2004, they completed a structured questionnaire about AIDS knowledge, beliefs and social distance.

Results: The overall correct response rate for all items was 59.8.0% while 24.4 % of the students had no idea. They had also misconceptions especially about the transmission routes. Age, grade, type of high school, place of childhood habitat and parent's education were associated with AIDS knowledge score. Nearly all of the students believe that HIV/AIDS is an important problem for Turkey. More than half of the subjects stated that they have no HIV transmission risk. Nearly half of the subjects expressed discomfort at the prospect of contact people with HIV/AIDS. The differences in the social distance by age, grades, place of childhood habitat, province, school type and father's education were statistically significant.

Conclusions: The data suggested that knowledge gaps remained about HIV/AIDS and individual risk perception was low. Negative attitudes towards people with HIV/AIDS were also common. Interventions to reduce social distance should be one of the important parts of educational programs.

Keywords: HIV/AIDS, knowledge, social distance, students

Introduction

The acquired immunodeficiency syndrome (AIDS), in the third decade, is one of the greatest global challenges. Since the earliest days of the epidemic, persons with HIV/AIDS (PWAs) have been subjected to social ostracism, discrimination, and violence[1]. Stigma and discrimination associated with HIV/AIDS are common around the world and have a profound impact on health. First of all, they are important barriers in infection prevention, providing adequate care, support and treatment[1,2]. It also reduces the capacity of communities to overcome the challenges. In addition, PWAs internalise the stigma, which can lead to self-loathing, self-blame, lack of self-worth and self-destructive behaviours[1]. In brief, public health has been negatively affected by stigma and discrimination.

The terms of social distance, stigma, and discrimination are closely related terms. Social distance is described as perceived distance between individuals or groups, and the concept has a long history in social science[3]. Stigma can be defined as all unfavourable attitudes, behaviours, beliefs, and policies directed toward to people and to their social groups. Discrimination refers to the action usually taken as a result of prevailing stigma[1]. Social distance in AIDS may be increased like in many diseases and it is closely related to stigma, discrimination, and social exclusion.

With regard to control of the epidemic, tackling stigma and discrimination are the major issues. However, it requires a comprehensive approach including education of health professionals and community leaders, provision of mental health services, scientific research, legislation, and education

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campaigns for the whole community[4]. Researches are also needed to identify effective methods of tackling stigma and discrimination.

This study reports the data obtained from Turkish high school students in two provinces. The aim was to determine risk perceptions, AIDS knowledge, beliefs, and social distance of the students to PWAs, to explore social distance by some socio-demographic variables such as age, gender, parent education, and residency, and to evaluate the effects of the high school types on social distance.

Although the first AIDS case in Turkey was reported in 1985, little is known about the AIDS related social issues in Turkey. The total number of people with HIV/AIDS was 1712 at the end of 2003[5]. However, the data does not reflect the real number of HIV infected people because of insufficient registration system. On the other hand, it is clear that AIDS related social problems are getting more important in the Turkish population because of the increasing case number and no intervention related to this issue.

Methods

Setting

The data was obtained from two provinces in this study. Erzurum which is in the eastern part of Turkey, is one of the least developed regions. Its total population is 959,000 of which 40.0 % is in villages. Istanbul is the biggest province and is in the western part of Turkey. Its population is 11.6 millions, of which 9.0 % lives in the villages[6].

Sampling

In this cross-sectional study, the data were collected in 2004 and the study sample consisted of 1410 students drawn from 9 state high schools. These schools include general, health, and religious high schools and they were randomly selected from each city centre. There were one religious high school, one health high school, and 10 general high schools in Erzurum. A total of 9 schools were selected accounting for 3 schools in Erzurum, 6 schools in Istanbul. Each school was selected from different district in centre of Istanbul. Three schools were on the Anatolian side (Kadikoy, Uskudar, and Kartal), and three schools were European side (Bakirkoy, and Kagithane). The data was obtained from the selected 6 six schools, and no permission problems occured. In the case of schools being more than one, the school was selected by simple random sample. According to the number of the classes, every third class from each grade (grade 9, 10, and 11) were randomly selected and all of the students in these classes had completed a structured questionnaire under observation. The response rate was 98.0%.

The Questionnaire

The questionnaire consisted of three sections and was applied in advance to 20 students to confirm clarity. Items in the first section were related to descriptive variables; age, gender, school type, grade, parent education, and risk perception. The second section had 25 questions to evaluate AIDS knowledge including general characteristic, transmission routes, and prevention measures. Each item had three choices, and it was pointed as follows; correct answer = 1, incorrect answer or no idea = 0. The points were summed to calculate the total knowledge score with minimum zero point and max 25 points. The Social Distance Scale was used in the last section in order to measure distance between oneself and a person with HIV/AIDS[7]. Each item has a 7-point scale ranging from 1 (no discomfort) to 7 (absolutely discomfort). The item points were summed in order to calculate the total score with minimum 14 points and maximum 98 points. Chronbach's alpha value of the scale was 0.93 in our sample.

Statistical analyses

Statistical procedures were carried out using the Epi Info version 3.3. 2 developed by Centers for Disease Control and Prevention. T-test, pearson correlation and analysis of variance were used for the data analysis. $p < 0.05$ was chosen a as statistically significant.

Legal ethical consent

The students and authorities of the schools were informed about the study, and informed verbal consent was obtained from the participants. Any variable about student identification was not obtained.

Results

A total of 1387 (98%) students completed the questionnaire accounting for 43.6% male, 56.4% female. With regard to gender by the school types, of the students in the health high schools, 98.3% were female, and 1.7% were male. Of the students in the general high schools, 39.4% were female, and 60.6% were male. Of the students in the Islamic religious schools, 54.2% were female, and 45.8% were male. The mean age of the students and the standard deviation (SD) was 16.4 ± 1.1, ranging from 14 to 19 years.

In terms of AIDS risk, 94.5% of the students believed that AIDS is an important problem for the Turkish society. However, 54.4% of the subjects stated that they have no HIV risk in the future. Main sources of knowledge about AIDS were media, lessons, and friends respectively. Of the students, 52.7% stated that PWAs should be publicly announced or somehow marked as HIV+.

The responses to the AIDS knowledge questions include general characteristics, transmission and prevention methods which are presented in Table 1. The overall correct response rate was 59.8%, while 24.3% of the students had no idea.

Although vast majority of the students had correct knowledge about the item that AIDS is a contagious disease, the correct response rate for the

Table 1. The students knowledge about general characteristics, transmission route and prevention (n=1378)

General characteristics	Correct answer (%)	Incorrect answer (%)	No idea (%)
AIDS is a contagious disease	93.7	2.7	3.6
There is no curative treatment	44.8	32.2	23.0
There is a vaccine for AIDS	47.1	23.7	29.2
A person infected with HIV looks healthy	75.6	7.2	17.2
AIDS is seen only in homosexual persons	65.0	7.1	27.9
An infected person with HIV may have lived for years without any symptoms	46.2	23.7	30.1
Diagnosis of the disease needs blood tests	61.8	9.5	28.7
AIDS is a disease that impairs immune system	58.8	6.5	34.7
Chronic diarrhoea, and lesions in mouth are among the first findings	24.2	12.3	63.5
Average percentages	57.5	13.9	28.6
Transmission routes			
Sexual contact with an infected person	97.5	0.5	2.0
Blood transfusion and organ transplantation	87.4	2.8	9.8
An infected pregnant woman is infecting her unborn baby	73.0	6.0	21.0
The breast feeding of an infected person	38.3	24.5	37.2
Holding and shaking hands with an infected person	75.3	7.8	16.9
Sharing razor blade with an infected person	49.3	28.2	22.5
Cheek kissing	66.5	14.2	19.3
Sharing public bath or toilets with an infected person	48.5	25.8	25.7
Sharing needle with an infected person	75.8	6.2	18.1
Sharing the same glass, towel, or fork	44.3	33.2	22.5
Insect and and/or mosquito bite	36.9	31.7	31.3
Sneeze, cough	44.1	29.6	26.3
Average percentages	61.4	17.5	21.1
Prevention methods			
Condom use	66.1	3.9	30.0
Monogamy	72.8	9.7	17.5
Not sharing needle	82.9	3.8	13.3
Physical exercise	32.8	36.0	31.2
Average percentages	63.7	13.3	23.0
Overall	59.8	15.9	24.3

general characteristics of the HIV/AIDS was 57.5%. In addition, 28.6% had no idea about the general characteristics.

In terms of transmission routes, the correct response rate for 12 items was 61.4%. On the other hand, 21.1% students had no idea about transmission routes. The correct response rates were lower than 50% in the items about insect and mosquito bites, breast feeding, sharing razor, public bath and toilets, sneezing, and coughing.

With regard to preventive methods, correct response rate was 63.7% and 23% of the students had no idea. The percentages of students who stated condom as a preventive method, was lower than the percentages of students who stated monogamy and not sharing the needle is a preventive methods.

The AIDS knowledge scores by socio-demographic variable were presented in Table 2. A statistically significant association was found between age, grade, place of childhood habitat, and parent

Table 2. AIDS knowledge scores by socio-demographic variables

Socio-demographic variables	Mean knowledge score, and standard deviation	Statistical value
Age		
14	14.3 ± 2.4	r = 0.12, p < 0.001
15	15.0 ± 2.3	
16	15.3 ± 2.4	
17	15.4 ± 2.6	
18	15.9 ± 2.4	
19	15.5 ± 2.3	
Gender		
Male	15.4 ± 2.5	t = 0.8 p = 0.4
Female	15.3 ± 2.4	
Grade		
1	15.1 ± 2.3	F = 20.9, p < 0.001
2	15.3 ± 2.5	
3	16.0 ± 2.3	
High school type		
Health	15.9 ± 2.0	F = 23.2, p < 0.001
General	15.5 ± 2.5	
Religious	14.7 ± 2.5	
Provinces		
Erzurum	15.3 ± 2.4	t = 0.8, p = 0.4
Istanbul	15.4 ± 2.4	
Childhood habitat		
City	15.5 ± 2.3	F = 10.2, p < 0.001
Town	15.4 ± 2.4	
Village	14.7 ± 2.8	
Mother Education		
Illiterate	15.3 ± 2.7	F = 4.5, p = 0.001
Primary school	15.2 ± 2.4	
Secondary school	15.8 ± 2.4	
High School	15.7 ± 2.7	
University	16.2 ± 2.1	
Father Education		
Illiterate	14.7 ± 2.7	F = 4.1, p < 0.001
Primary school	15.2 ± 2.6	
Secondary school	15.6 ± 2.3	
High School	15.5 ± 2.2	
University	15.6 ± 2.3	
Overall mean	15.4 ± 2.4	

Table 3. Attitudes of the students by the items of the SDS (n=1378)

Some attitudes towards to PWAs	Discomfort %	Absolutely discomfort %	Total %
Sitting side-to-side in a public bus for a short travel	26.2	22.0	48.2
Sitting side-to-side in a public bus for a long travel	30.6	17.6	48.2
Shopping from a shopkeeper with AIDS/HIV	27.4	18.4	45.9
A doorkeeper with AIDS/HIV in your apartment	27.8	17.1	44.8
Your lease holder with AIDS/HIV	26.0	17.4	43.4
Joining a family meeting with a HIV positive person	30.6	15.3	45.9
Playing a game with a HIV positive person	29.1	18.3	47.4
To talk about your country problems with a HIV positive person	26.2	19.3	45.5
To talk about your dairy problems	25.3	19.6	44.9
A close neighbour with AIDS/HIV	30.1	18.8	48.9
Your hairdresser or coiffeur with AIDS/HIV	26.1	25.4	51.5
Sharing a room in your workplace with a person AIDS/HIV	30.3	19.2	49.5
Sharing a workplace but in different rooms	25.2	19.1	44.3
That your sister want to marry with a person AIDS/HIV	14.2	35.9	50.1
Total	**26.8**	**20.2**	**47.0**

education with the AIDS knowledge score ($p< 0.001$). The knowledge scores increased with age and grades. The scores were lower if that childhood habitat was a village rather than the others. A positive relationship was observed between parent education level and the knowledge scores. The differences in the AIDS knowledge score by the school type were also significant ($p<0.001$). The lowest AIDS knowledge score was in the religious high schools while the highest score was in the health high schools (14.7 vs 15.9 respectively). The knowledge scores by gender and cities did not show any significant difference ($p > 0.05$).

Attitudes of the subjects towards PWAs by selected items are presented in Table 3. Nearly half of the students expressed discomfort at the prospect of contact with PWAs. Although the students in the health high school had the highest knowledge score, their social distance scores did not differ from other students ($p>0.05$).

The social distance scores by socio-demographic variables are shown in Table 4. The social distance was increasing with age. Differences in the mean scores by grades and place of childhood habitat were significant ($p < 0.001$). The lowest score was in the first grades while the highest score was in the third grades. In terms of childhood habitat, the lowest score was in the city while the highest score was in the village. The social distance towards PWAs was significantly lower in Istanbul than in Erzurum ($p < 0.001$). The differences in the social distance by school type was also significant ($p<0.001$). Social distance among students of health high schools was higher than the others. Controlling for gender, the students of the health high schools had still the highest social distance score. The differences in the social distance by gender were not significant ($p > 0.05$). With regard to parent education, difference in social distance by mother education was not significant while it was significant by father education ($p < 0.05$). Social distance scores were higher in the students whose fathers were illiterate and had university education, than the others.

When we wanted to see association between knowledge and attitude; we have seen that there was no significant correlation between knowledge score and social distance score ($r = 0.04$, $p > 0.05$). However, a slightly negative correlation was found between knowledge score and social distance score of the students in general high schools ($r= -0.1$, $p = 0.010$). This relation was not observed for the other students (data was not shown).

Table 4. Social Distance Scores (SDS) by socio-demographic variables

Socio-demographic variables	Mean SDS and SD	Statistical value
Age		
14	57.3 ± 17.8	r = 0.14, p < 0.001
15	53.9 ± 20.9	
16	57.6 ± 21.5	
17	61.6 ± 20.2	
18	62.0 ± 20.0	
19	62.2 ± 20.2	
Gender		
Male	59.6 ± 21.0	t = 1.4 p = 0.16
Female	58.0 ± 20.9	
Grade		
1	55.7 ± 21.5	F = 12.8, p < 0.001
2	60.0 ± 20.3	
3	62.9 ± 19.8	
High school type		
Health	62.1 ± 18.7	F = 6.9 p = 0.001
General	58.7 ± 24.4	
Islamic religious	56.2 ± 20.9	
Provinces		
Erzurum	65.1 ± 18.9	t = 12.0 p < 0.001
Istanbul	52.2 ± 20.9	
Childhood habitat		
City	57.0 ± 21.4	F = 6.0, p = 0.002
Town	59.7 ± 20.4	
Village	62.3 ± 20.0	
Mother education		
Illiterate	60.6 ± 17.8	F = 1.9, p = 0.1
Primary school	57.4 ± 21.3	
Secondary school	61.1 ± 21.1	
High School	58.2 ± 22.4	
University	60.8 ± 21.7	
Father education		
Illiterate	62.6 ± 18.7	F = 2.5, p = 0.04
Primary school	57.9 ± 21.0	
Secondary school	57.7 ± 19.8	
High School	57.7 ± 21.6	
University	62.2 ± 22.0	
Overall	**58.7 ± 20.9**	

Discussion

This study evaluated risk perception, AIDS knowledge, and social distance to PWAs among Turkish high school students. Nearly, all of the students stated that AIDS is an important problem for the Turkish society. In a similar study which was done 11 years ago in Turkey; this percentage was found as 86%.[8]. The difference may be due to the increasing number of cases both in Turkey and in the world. In a recent study in Iran, 93.0% of the students reported that AIDS was an important problem for their community[9]. In Greece, 90 % of the students considered AIDS to be a big threat for the society[10]. The current percentages are very close in the neighbour countries[9,10]. Nearly all of the students thought that AIDS was a big threat for their society.

On the other hand, more than half of the students do not believe that they are likely to become infected with HIV in the future. In Austria, 65 % of the students said they were worried about the possibility of being infected[11]. In Greece, one out of three students were worried about already being HIV infected[10]. The risk perception of Turkish students is lower and it may encourage students about risky behaviours. In the education programs, more attention should be given on individual risk perception related to HIV/AIDS.

AIDS Knowledge

In term of AIDS knowledge, more than half of the students had correct information about general characteristics of the disease. Although most of the students stated main transmission routes correctly, data indicated misconceptions about the transmission routes such as sneeze, cough, towel, glass and fork, insect bites, and using public baths and toilets. Rate of the hand shaking and kissing as a transmission route was relatively less than the other misconceptions mentioned above. The rates of misconceptions in this study are similar to the results of a study carried out in Iran[9]. However, the misconceptions are more common than in general populations of the United States[12]. This result indicated that the misconceptions should be one of the main components of AIDS education.

With regard to prevention, that the percentage of the students who stated 'condom use' was lower than the percentage of the students who stated 'not sharing needle' and 'monogamy' is a notable finding. The AIDS education campaigns which stressed monogamy in Turkey may play a role in this result. Despite to an increased number of the students who stated 'condom use', this finding suggested that more effort has to be given on this issue.

The data supported that AIDS knowledge increased with age, and grades. Village, as a place of childhood habitat, low level of parent education have negative effect on the knowledge scores. Similar results were also reported in previous studies[13,14]. In term of school type, students in the health high schools have more knowledge as an expected result. On the other hand, there is no significant difference of AIDS knowledge by gender. Results of the studies on this issue were inconsistent; male were more knowledgeable in some studies[15,16] while female were more knowledgeable in other studies about reproductive health issues[14,17].

Despite the high AIDS knowledge scores of the students in health high schools, their attitudes were not more positive than the other students.

As an expected result, the AIDS knowledge of the students coming from cities was higher than that of the others. Students those childhood habitat were city or town had more knowledge than the other students those childhood habitat was village

Social Distance

Nearly, half of the students expressed discomfort at the prospect of personal contact with PWAs. Savaser reported that half of the Turkish students believed that PWAs should be able to attend school and should not have to stop working[13]. Similar results were also reported among the students in Iran[9]. In Greece, it was reported that one-fourth felt uncomfortable having contact with PWAs[12]. All of the studies indicated that stigmatising responses and discrimination against PWAs were common.

Despite the laws, more than half of the students thought that people with AIDS should be made public. This percentage is 16.3% in general population in the United States[12]. Of the students in Austria, 90 % said they would accept someone with AIDS in their class[11]. This finding supported that patient and human rights had to be among the main issues. One may be use a slogan like this; 'Our enemy is HIV/AIDS, not PWAs'.

Increasing of the social distance with age and grades is a notable finding. This is also consistent with a previous study from the United States[18]. Although the social distance in male and female were similar in our study, it was reported that girls were more compassionate to AIDS patients than boys in two other studies[6,19].

The students in Istanbul have lower social distance score than the students in Erzurum. This is most likely related to socio economic and cultural factors of the cities. Istanbul is a more developed city than Erzurum.

With regard to the childhood habitat, the highest score was in the students from villages while the lowest score was in the students from cities. Similarly, Lal reported that students in urban areas demonstrated more favourable attitudes towards AIDS[20]. Our study indicated that students from rural areas are having lower knowledge about AIDS-HIV and more social distance.

The differences in social distance by mother education were not significant ($p > 0.05$), while it was significant in the knowledge score. This finding suggested that mother education has positive effects on AIDS knowledge but no effects on social distance. A notable finding is that social distance scores in the students whose fathers were illiterate or had university education is very close to each other. And these two groups had higher scores than the others. It seems that the association between father education and social distance was not linear.

With regard to school type, it is an interesting finding that the social distance score in the religious schools is lower than that of the others. Despite their highest knowledge score, the students in the health high schools have more social distance. This finding suggests that knowledge is not enough in order to gain positive attitudes. On the contrary, the knowledge may have negative effects on social distance towards people with AIDS. In other words, lack of psycho-social approach to the education in the health schools may contribute to this result. Curriculum of the health schools should be focused on positive attitudes as well as knowledge. In another study carried out on a health high school and social science schools in Turkey, any significant difference of prejudice by the school type was reported[21]. Sachdev, in this study, asserted that social work students were likely to be more positive in their attitudes toward AIDS victims than those in nursing or humanities[22]. Our data asserted that current education methods in health high schools did not reduce social distance to PWAs.

Although many variables are associated with social distance, no association was found between AIDS knowledge and social distance. Previous studies were inconsistent about relation between knowledge and attitude in terms of reproductive health: There is no association of knowledge scores with attitude and practice scores among out of school youth in Ethiopia[23]. In another study, it was reported that knowledge did not increase the use of safe sex, but limited sexual behaviour[24]. Similarly, no significant correlation was found between knowledge score and attitude score while a significant correlation was found between fear scores and attitude scores in a study carried out in South Africa[15]. In the study population, the data did not support that knowledge has positive effects on social distance between students and PWAs. However, Sachdev suggested that knowledge was positively related to attitudes and perception of risk[22]. Similar result was also reported that students with high AIDS knowledge level have less negative attitudes among the German nursing students[25]. Valimaki indicated that education might have different effects in different groups and that teaching methods were extremely important[18]. It seems that knowledge is not always enough to change attitudes alone[26,27]. Method and content of the education, and feature of the groups are important factors on changing attitudes.

Conclusion

It was concluded that the high school students had knowledge gap about HIV/AIDS and misconceptions were common. AIDS knowledge level was associated with age, grade, school type, place of childhood habitat, and parent education. Individual risk perception is very low while all of the students stated that HIV/AIDS is an important problem for Turkey. Nearly half of the students expressed discomfort at the prospect of contact with PWAs. Social distance was also associated with age, grade, school type, province, and place of childhood habitat. Intervention programs to reduce social distance should be one of the priority issues in Turkey.

Curriculum of the health schools should be reconsidered in terms of positive attitudes and behaviours towards people with AIDS or other diseases.

Author Contribitions

ET planned the design of the study, collected and analysed the data. She also drafted the manuscript. YI participated in the planning of the study, in the collecting of the data, and helped to draft the manuscript. TI participated in the planning of the study and helped to draft the manuscript. All authors read and approved the final manuscript.

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Sources of Contraception Knowledge of Adolescents Attending Different Types of High Schools, Ankara, Turkey

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Abstract

Objective: To determine the sources of knowledge on contraception for high school students attending schools of various types.

Methods: A cross-sectional study was carried out in June 2000. 344 students out of 370 (92.97%) attending their last year of various high schools in a town of Ankara were included in the study. Researchers developed a questionnaire and it was conducted under observation.

Results: There was a significant difference between schools as to the source of contraception knowledge ($p<0.05$). Students attending normal high schools (NHS) tended to use the press more to get this knowledge, compared to students of other schools. Almost none of the students of religious high schools (RHS), industrial vocational high schools (IVHS) and female vocational high schools (FVHS) knew the definition of contraception. There was a significant difference between schools as to knowing at least one modern method. A higher percentage of health vocational school (HVHS) students knew at least one effective method. Female RHS students were less likely to think that the teaching of family planning as a course at school was appropriate, compared to female students of other schools ($p<0.05$).

Conclusion: Discussion of reproductive health information is taboo among those receiving religious education and those in closed high school environments where NHS male students attend. Turkey needs to promote education of students on reproductive health systematically and to ensure that the press, the main source of information, publishes reproductive health articles that are correct, clear and easy to understand.

Key Words: adolescents, contraception, knowledge, source, school

Introduction

ICPD (International Conference on Population and Development) recommended that family planning services should be everybody's right, married or unmarried, young or old, male or female[1]. It was emphasized that before they were sexually active, males and females needed to be educated to go through a healthy sexual and reproductive phase. It is therefore necessary to present reproductive health information that includes contraception details for adolescents[2].

Sexuality is a taboo subject in Turkey and sexual relations outside marriage are generally not accepted for females. They usually experience their first sexual intercourse when they get married. The median age of girls for first marriage is 20[3]. Sexual relation before marriage is considered normal for males and the average age for their first sexual relation is 19.2[4]. Inadequate or incorrect information and the conflicting messages received on reproductive health from the mass media devices is a serious problem for young people. The traditional information-supplying role of family and friends has now become less important; but systematical education inside and outside of the school has not been able to take its place[5].

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Contraception and sexual information is presented in the 9th class (first year of high school, when students are 14-15 years old) within the health information course in all high schools. This course is two hours per week and 64 hours per year. High schools have various programs according to the Main Law of National Education. Examples are Technical Schools, Female Vocational Schools and Religious Schools[6]. These names are given according to their core curriculum. Children who are attending these schools, which have different structures to one another, also have families of different sociocultural and financial structure. Taking into consideration the teachers' and students' approach to life and the differences between schools, one should expect that children could receive a variety of information from various sources, on the subject of reproductive health.

We have aimed to determine and compare the knowledge levels on contraception in final year high school students from schools of different structures.

Methods

This study was carried out with students attending the final year of high school (11^{th} grade) in the Elmadag town of Ankara in June 2000. Elmadag is located at a distance of 41 km from Ankara[7], and has a population of 43 374[8]. The town has five high schools of different structures [Normal high school (NHS), Religious high school (RHS), Health vocational high school (HVHS), Industrial vocational high school (IVHS) and Female vocational high school (FVHS)]. All high schools in this town were recruited in the study. These high schools consist of the 9^{th}, 10^{th} and 11^{th} and/or 12^{th} (according to the type of school) grades. The total number of final year students in these high schools was 370, and 344 (92.97%) of them participated in this study. The remaining students were absent at the time of the study application. A written consent from the school administration and a verbal consent from the students were taken.

Researchers developed a 27-item questionnaire which was conducted under observation. Seven questions addressed were on sociodemographic information, eleven on contraception knowledge, four on contraception beliefs and five on source of knowledge. When the responses to the question "What is the definition of contraception?" were being evaluated, the following four criteria that should have been included in the definition were taken into consideration:

1. To protect myself from sexually transmitted disease
2. To have children when desired
3. To have the desired number of children
3. To have the number of children that one can take care of in every way[9]

The response was evaluated as 'knows' if it contained two of these criteria, and as 'does not know' if one criterion was included or if there was no response or if the student replied that he/she did not know the answer.

Statistical analysis of the data was carried out using the chi square test on the Epi Info software, version 6.0. A p value <0.05 was considered to be statistically significant.

Results

This study included 344 (92.97%) adolescent students. The median age and number of siblings were 17.0 (15-19), 3.0 (1-5) respectively. Among the students from all schools, 8.6-10.8% had an illiterate mother and 1.1-3.2% had illiterate fathers. Almost all the mothers were housewives and 2.1-6.5% of the fathers were unemployed. Some sociodemographical characteristics of the students according to their schools are presented in Table 1.

The first sources of information were press (43.4%), friends (40.1%), teachers (50.1%), press (23.4%), and family (37.5%) for schools NHS, RHS, HVHS, IVHS and FVHS respectively. When all students were considered without taking sex into consideration, there was a difference as to the contraception information source between schools ($p<0.05$) and this difference was due to NHS students. NHS students used the press more than other school students to obtain this information. There were significant differences between schools for males and females ($p<0.05$) according to their information sources and these differences were due to the HVHS. Among RHS students, 62.5% of the males received their information from the press while 50.1% of the girls obtained the information from their friends and there was a significant difference between the sexes ($p<0.05$) (Table 2).

Table 1. Sociodemographical characteristics of the students by school, 2000, Ankara, Turkey

Characteristics n=344	Schools				
	Normal High School (n=140)	Religious High School (n=31)	Health Vocational High School (n=62)	Industrial Vocational High School (n=95)	Female Vocational High School (n=16)
Sex	%	%	%	%	%
Male	40.0	25.8	38.7	100.0	—
Female	60.0	74.2	61.3	—	100.0
Mother's education					
Illiterate or less than 5 years	18.6	22.6	19.4	20.0	31.3
Graduate of primary school	46.4	61.3	61.3	63.2	50.0
Graduate of secondary school	14.3	9.6	14.5	10.5	12.5
Graduate of high school	17.1	6.5	4.8	4.2	6.3
Graduate of university	3.6	—	—	2.1	—
Father's education					
Illiterate or less than 5 years	4.3	3.2	3.2	2.2	—
Graduate of primary school	25.0	32.3	38.7	40.0	31.3
Graduate of secondary school	16.4	35.5	29.0	23.2	37.5
Graduate of high school	39.3	25.8	24.2	30.5	25.0
Graduate of university	15.0	3.2	4.8	4.2	6.3
Mother's occupation					
Housewife	91.4	100.0	98.4	95.8	100.0
Manual worker	2.1	—	1.6	2.1	—
State servant	3.6	—	—	2.1	—
Other	2.9	—	—	—	—
Father's occupation					
Unemployed	2.1	3.2	6.5	5.3	—
Manual worker	35.0	48.5	32.3	35.2	62.6
Farmer	3.6	8.4	14.5	8.4	6.2
State servant	31.5	16.1	29.0	26.3	6.2
Self-employed	10.7	16.1	1.6	7.4	—
Other	17.1	9.7	16.1	7.4	25.0

% Column percentage

Table 2. Sources of Information about contraception by sex and school 2000, Ankara, Turkey

Source of Information	Schools (%)										
	Normal High School*			Religious High School**			Health Vocational High School***			Industrial Vocational High School	Female Vocational High School
	Male#	Female§	Total†	Male#	Female§	Total†	Male#	Female§	Total†	Male#	Female§
	(n=56)	(n=84)	(n=140)	(n=8)	(n=23)	(n=31)	(n=24)	(n=38)	(n=62)	(n=95)	(n=16)
Teacher	11.3	4.8	7.4	12.5	13.6	13.3	45.8	52.6	50.1	16.7	12.5
Friend	17.0	18.1	17.6	12.5	50.1	40.1	12.4	—	4.8	14.4	18.8
Family	15.1	20.5	18.4	—	18.2	13.3	—	2.6	1.6	11.1	37.5
Health Staff	7.6	8.4	8.1	—	4.5	3.3	33.4	18.5	24.2	17.8	6.2
Press	47.2	41.0	43.4	62.5	9.1	23.4	4.2	26.3	17.7	23.4	25.0
Other	1.8	7.2	5.1	12.5	4.5	6.6	4.2	—	1.6	6.6	—

% Column percentage

* Between male and female students of Normal High School, p>0.05

** Between male and female students of Religious High School, p=0.0066

*** Between male and female students of Health Vocational High School , p>0.05

\# Between male students of all high schools, p=0.0001

§ Between female students of all high schools, p=0.0072

† Between students of all high schools, p=0.0342

There were no differences between the schools, and between the sexes for schools other than HVHS, as to the percentage knowing the definition of contraception (p>0.05). However there was a difference between schools when girls and boys were evaluated within themselves (p<0.05). Almost none of the RHS, IVHS and FVHS students knew the definition of contraception (Table 3).

There was a significant difference between the sexes as to knowing at least one modern contraception method in NHS and RHS (p<0.05). When male and female students were evaluated within themselves there was a difference between schools (p<0.05). This difference was due to HVHS for the females, because of higher correct answer rate than others and NHS and HVHS for the males. When all students were evaluated together there was again a difference between schools for knowing at least one modern method (p<0.05) and this difference was due to HVHS. A higher percentage of HVHS students answered the question correctly (Table 3).

Girls in RHS were being taught appropriately of contraception at school as a course at significantly lower rate, and boys in HVHS were oppositely at significantly higher rate (p<0.05) (Table 3).

Table 3. Distribution of correct answers given to selected questions by sex and school, 2000, Ankara, Turkey

		Schools				
Questions	Sex	Normal High School*	Religious High School**	Health Vocational High School***	Industrial Vocational High School	Female Vocational High School
Definition of contraception	M#	30.4	0.0	54.2	5.3	—
	F§	44.0	13.0	81.6	—	18.8
	T†	38.6	9.7	71.0	5.3	18.8
Name of at least one effective contraceptive method	M#	60.7	12.5	95.8	12.6	—
	F§	77.4	82.6	100.0	—	56.3
	T†	70.7	64.5	98.4	12.6	56.3
Positive attitude towards teaching contraception at school as a course	M#	89.3	62.5	95.8	68.4	—
	F§	89.3	52.2	100.0	—	93.8
	T†	89.3	54.8	98.4	68.4	93.8

% the percentage of correct answer by sex and by total

For the first question

*** Between male and female students of Health Vocational High School, p=0.0205

Between male students of all high schools, p=0.0001

§ Between female students of all high schools, p=0.0001

† Between students of all high schools, p=0.00001

For the second question

* Between male and female students of Normal High School, p=0.0337

** Between male and female students of Religious High School, p=0.0007

Between male students of all high schools, p=0.0001

§ Between female students of all high schools, p=0.0010

† Between students of all high schools, p=0.0001

For the third question

Between male students of all high schools, p=0.0019

§ Between female students of all high schools, p=0.0001

† Between students of all high schools, p=0.0001

Discussion

Adolescents make up an important percentage of our population (19.7%) and need information on contraception and its methods. They also state that they want to receive this information[10,11]. Studies from various countries have also reported that adolescents need information on reproductive health subjects such as family planning and sexual health[12-15].

In our study the main information source for contraception was the press for male students in all schools except HVHS, while the source varied for female students. The source of information was the teacher for both male and female HVHS students. For schools other than HVHS, the teachers from NHS made up 4.8-16.7% of the information sources. This revealed that the health information course on the subject of reproductive health at schools was not as effective as desired. Contraception is a part of reproductive health and is one of its main subjects. Reproductive health and contraception are learned from similar sources. Studies in our country have reported the information source for reproductive health and family planning as media devices such as the television, radio, newspapers and magazines[16-19].

Studies from various countries have also pointed to the press as the sexual information source for 32-70% of adolescents[13,20-22]. One of the action plans suggested at the Cairo Conference was to ensure that the reproductive health programs of the countries met adolescents' requirements[1]. Although services are provided for adolescents at primary healthcare institutions in our country, contraception is still learned from the press.

It is important that female students, the mothers of the future, know the definition of contraception better than the male students but this is not sufficient for either sex. Although there is a health information course during the first year of all high schools, the fact that almost none of the RHS, IVHS and FVHS students knew the definition of contraception made the efficacy of the course doubtful. The students of these schools defined their contraception information source as their friends and family, which meant that it was not possible to correct, possibly misguided information, with the health information course. In a study from India, on the level of knowledge on fertility control, girls whose mothers were working and had a higher level of education had more information than girls whose mothers were housewives and had a lower level of education[23]. The fact that all the mothers of RHS students and almost all the mothers of the students of other schools were housewives and that the mothers of the FVHS, RHS and IVHS students had not attended school at all or had attended for less than five years, support the study from India with similar results.

When female students, male students and all students were evaluated for knowing at least one effective contraception method, there was a statistically significant difference in all three groups ($p<0.05$) and this difference was due to the HVHS students in all three groups. The reason for this is, probably better contraception of the HVHS students as they receive education relevant to their future occupation. A study on high school students has reported that 75.7% are aware of at least one effective contraception method[24].

Teachers made up NHS students' 4.8 to 16.7% of the information sources, providing contraception information, one of the main subjects of reproductive health, for schools other than HVHS. This means that the health information courses at schools do not achieve the desired results for reproductive health subjects.

Although the knowledge of students on reproductive health was very limited, the percentage of those thinking that 'teaching contraception at schools as a course was appropriate' was 90% at NHS, HVHS and FVHS but lower at RHS where religious education is present, and IVHS where NHS male students attend (62.5% and 68.4% respectively) and NHS 52.2% among females attending RHS. This result shows that discussion of reproductive health information is taboo between those receiving religious education and closed communities. As RHS students are being educated to become religious leaders and will be influencing large masses after they graduate, it is important that they have to have more reproductive health knowledge than other students their age.

According to our study results mandatory sex education is not working well. Turkey, who has signature under action plans and has participated in international conferences and congress needs to promote education of students on reproductive health, systematically. It also has to be ensured that the press as one of the main sources of information, publishes reproductive health articles that are correct, clear and easy to understand.

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Outdoor noise levels of primary schools in Isparta

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Abstract

Objectives: Noise, an ubiquitous environmental pollutant, around educational centers can negatively affect the health and performance of the children. This study aims to determine the noise levels of outdoor environment of primary schools; to investigate the relation between the characteristics of school environment and the outdoor noise levels.

Methods: The sound levels have been measured with a precision sound level-meter in the outdoor areas of primary schools. The characteristics of the environment of the primary schools have been determined. Descriptive statistics, Pearson's correlation and Spearman's correlation and multiple regression analysis were carried out for statistical analyses.

Results: The forty nine percent of primary schools having outdoor sound level over 55 dBA were determined. The number of all vehicle, the number of heavy vehicle, the percentage of heavy vehicle and other present noise sources were determined, that were positively correlated with outdoor noise levels. The percentage of heavy vehicle was associated with outdoor noise levels in multiple regression model.

Conclusion: As a result of this study, it has been determined that 48.8% of the schools are chronically exposed to noise level over 55 dBA. Schools in the study region are exposed to noise levels lower than those in big cities in Turkey. The noise level is related to the percentage of heavy vehicles passing on the road near the school. Precautions concerning busy car traffic, particularly at school hours, should be taken.

Key words: noise level; children; primary school

Introduction

Every child has the right to grow up in a healthy environment - to live, learn and play in healthy places. Children are the most vulnerable population group to unhealthy environments that contribute to about one third of the total burden of diseases among children per year, worldwide[1]. Many various factors are considered as the major environmental health problems affecting children[2]. Noise, an ubiquitous environmental pollutant, is a public-health issue because it leads to annoyance, reduces environmental quality, and might affect health and cognition in children[3,4].

The problem with noise is not only that it is unwanted, but also that it negatively affects human health and well-being[5]. Harmful effects of noise on human consist of auditory and non-auditory effects[6]. Auditory effects are physical effects of noise, like hearing loss related noise, hearing impairment, threshold shift or tinnitus. Non-auditory effects of noise are physiological effects (startle and defense reaction leading to potential increase of blood pressure), interference with speech communication, sleep disturbance (difficulty in falling asleep, alterations in sleep rhythm and being woken up), psychological effects (headaches, fatigue and irritability), performance effects (task performance,

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distraction and productivity), annoyance (feeling of displeasure, tolerances vary enormously and noise impulses more annoying than a steady noise)[7]. In children, the adverse effects of noise are similar to those with adults, but noise can negatively affect children's learning and language development, it can disturb children's motivation and concentration and can result in reduced memory and in reduced ability to carry out more or less complex tasks[6]. Noise may provoke a stress response in children that includes increased heart rate and increased hormone response, and noise may disrupt sleep and hinder needed restoration of the body and brain[6]. There have been many studies,[3,4,6,8-14] which provide evidence about noise affecting children. In these studies which examine the effects of chronic high levels of environmental noise on schoolchildren's cognitive performance and health, it has been found that noise exposure leads to decrease in school performance, memory deficit, noise annoyance and impaired well-being. For this reason, noise is important for school health. It is seen that the noise level inside the schools and classes are mostly evaluated in the literature[15-17] and the effects of inner environment noise level on students' learning and psychological health are researched. The students are exposed to inner environmental noise in the school. However, during the breaks, students are exposed to outer noise in outdoor environments. Also, when the kids are playing during the breaks, they may not be aware of the negative effects. Moreover, if the structural properties of the building are not adequate, outer environment noise can affect increase of inner environment noise level, and create an inadequate learning environment[18]. Thus, the outer environment noise level and the factors increasing it are as important as the classroom noise level.

The sound pressure level of the noise from external sources should not exceed 55 dBA (as LAeq) according to guideline values recommended by World Health Organization (WHO)[19] for the outdoor playgrounds of schools. In most countries, noise regulations suggest that the maximum outdoor noise level for educational buildings should be 55 dBA (LAeq). This means that an outdoor noise level above 55 dBA (LAeq), at the facade of educational buildings, will cause a decrease in educational efficiency[20]. According to the previous regulation of noise control in Turkey[21] from 1985 to 2005 the sound pressure level of the noise from external sources of school should not exceed 55 dBA. However, according to the current regulation of noise control in Turkey[22] the sound pressure level of the noise from external sources should not exceed 65 dBA (as LAeq) during daylight and 55 dBA (as LAeq) during night.

There are Turkish standards related to environmental regulations on school health (TS 12014-1995 and TS 9518-2000)[23-24]. According to these standards, it is pointed out that educational buildings should not be on the main road and measures should be taken to prevent the outdoor noise from penetrating the school. However, any limitation value is not given in these standards regarding noise.

Many sources can be taken responsible for the formation of noise; such as road traffic, jet planes, jet skis, garbage trucks, construction equipment, manufacturing processes, lawn mowers, leaf blowers, and boom boxes[5]. Traffic noise is one of the significant sources of the noise in cities compared to the other sources[7,25,26]. The predominant external noise source of school, particularly in urban areas, is likely to be the road traffic[27], although both aircraft noise and railway noise can affect schools in specific locations. In addition, manufacturing processes being near the school may increase the outdoor sound levels. Putting forward the effects of these sources on the level of schools' outer environment, noise level can lead to arrangements about basic noise sources near the schools. For example, special arrangements can be made about traffic flow or construction works near the schools. Determining outer noise levels and sources near the schools, examining the effects of noise sources on noise levels will contribute to creating a more secure environment for children.

The aims of this study are to determine the outdoor noise levels of primary school buildings and to investigate the relation between the characteristics of school environment and the outdoor noise levels.

Material and methods

Isparta City, which is located in the Mediterranean region of Turkey, is situated on many transit highways which connect the Aegean, Central Anatolia regions to the Mediterranean region. Some of these roads pass through the city center of Isparta. There are many primary schools near these roads.

In this study, the measurements were recorded in a total of 43 primary school buildings to determine the outdoor noise levels of primary schools to evaluate of environmental characteristics.

The survey was conducted for a period of 18 days. The period consists the days between February 20th-March 10th, 2006. In primary schools in Isparta, there is one daily education period from 8:30 am. to 15:30 pm. The measurements in a day were made in the time interval as: 09.00-11.00 a.m. By this way, it was tried to standardize the noise level fluctuations during whole day. One minute sample measurement was taken three times for each school and median levels recorded. The measurement period was chosen to be during teaching hours in a typical school day. Rush hours, the times when children were arriving at or being collected from school, and times when children were outside in the school playground were avoided.

The A-weighted acoustic parameters recorded are defined below.

L_{Aeq}: Continuous Equivalent Noise Level in dBA of a time varying noise is a single figure noise level which, over the period of time under consideration contains the same amount of A-weighted sound energy as the time varying noise over the same period of time.

L_{Amax}: Maximum root mean square A- weighted sound pressure level occurring within the specified period of time.

L_{Amin}: Minimum root mean square A- weighted sound pressure level occurring within the specified period of time.

During the study period, daily meteorological parameters were observed from the web site of The State Meteorological Works Department in Isparta[28] and all the measurements were performed almost under the similar local meteorological conditions with no precipitation such as wind velocity and temperature.

A calibrated hand sound level meter (Software for the CASELLA CEL -440, United Kingdom) was used in all measurements. According to the measurement standard[21] a measurement point must be at least 1 meter above the reflective surface to prevent interference of sound waves. Therefore, while we were measuring the noise level on a point close to a reflective building or material, a distance of at least 1 meter from those points was kept. The sound level-meter microphone was placed at a height of 1.5m above local ground level. The school building-road distance was measured by a hand meter and recorded.

In addition to measuring noise levels, the noise sources such as the number of vehicles crossing the road, number of heavy vehicles, weather status (cloudy or sunny), feeling wind velocity (none, mild or moderate) and being other noise sources (passerby or construction) which occurred during the measurement period were noted. The number and type of the vehicles (heavy vehicle or not) passing by the road near the school were calculated simultaneously with noise level measurements by a researcher for 10 minutes. 'Percentage of heavy vehicle' was calculated by dividing the number of heavy vehicle to total number of vehicle, and assessed as low if the percentage of heavy vehicle was lower than ten, as medium 10%-25% and as high over 25%.

The schools are accepted as inappropriate environment on account of noise, if the sound value of outdoor areas is over 55 dBA.

Descriptive statistics, Pearson's and Spearman's correlation tests were carried out using the Statistical Package for the Social Sciences (SPSS), with two tailed P-value of 0.05 used as a threshold for significance. Multiple regression analysis were performed to examine the relationships between the outdoor noise levels (dependent variables; L_{Aeq}, L_{Amin} and L_{Amax}) and the environment characteristics of primary schools (independent variables).

Results

Mean (SD) of the school building-road distance was 31.2 (20.8) m. Twelve of the schools (27.9%) were situated on the main road. The school buildings on the main (SD) road were 36.8 (28.3)m far away from the road. Mean (SD) of the number of vehicle cross from the road for ten minutes was 27.3(37.8) and mean (SD) of the number of heavy vehicle was 5.4 (10.2). Fiftyone point two percent of the 'percentage of heavy vehicle' of roads was low (<10%). Characteristics of the environment of primary schools during the measurement period were presented in Table 1, and characteristics of the sound levels measured distance of one meter from the building walls of the primary schools were presented in Table 2.

Table 1. Characteristics of the environment of primary schools during the measurement period (Isparta, 2006)

Characteristics	
School building-road distance (m) (mean[SD])	31.2 (20.8)
Total number of vehicles (mean[SD])	27.3 (37.8)
Number of heavy vehicles (mean[SD])	5.4 (10.2)
Percentage of heavy vehicles (n[%])	**n (%)**
Low (<10%)	22 (51.2)
Medium (25%-10%)	13 (30.2)
High (>25%)	8 (18.6)
Weather	
Sunny	29 (67.4)
Cloudy	14 (32.6)
Wind	
None	28 (65.1)
Mild	11 (25.6)
Moderate	4 (9.3)
Other noise sources	
None	28 (65.1)
Passerby	12 (27.9)
Construction	3 (7.0)

Table 2. Characteristics of the sound levels measured, distance of one meter from the building walls of the primary schools (Isparta, 2006)

Measurements (n=47)	min	max	median	mean	SD
LAmax (dBA)	49.7	80.9	67.7	66.1	6.7
LAmin (dBA)	34.9	57.6	43.5	44.5	5.4
LAeq (dBA)	38.7	66.0	53.9	53.7	6.3

At the end of the measurements, it was determined that the outdoor sound level (as LAeq) was over 65 dBA in one primary school (2.3%) and over 55 dBA in 21 primary schools (48.8%). All of the schools situated on the main road (n:12) had a noise level above 55 dBA.

The number of all vehicle, the number of heavy vehicle, the 'percentage of heavy vehicle' and being other noise sources were determined, that were positively correlated with outdoor noise levels (LAeq, LAmin, LAmax) (Table 3).

Table 3. Correlations between the outdoor noise levels and the characteristics of school environment during the measurement period (Isparta, 2006)

	Outdoor noise levels (dBA)		
	LAeq	LAmin	LAmax
School building-road distance (r)	0.132	0.138	0.036
Number of all vehicle (r)	0.632***	0.762***	0.325*
Number of heavy vehicle (r)	0.819***	0.784***	0.593***
Percentage of heavy vehicle (low:0; medium:1; high:2) (rho)	0.829***	0.814***	0.673***
Weather (sunny:0; cloudy:1) (rho)	0.196	0.114	0.060
Wind (none:0; mild:1; moderate:2) (rho)	0.143	0.157	0.094
Other noise sources (none:0; passerby or construction:1) (rho)	0.594***	0.613***	0.557***

*P<0.05; **P<0.01; ***P<0.0

Table 4. Multiple regression analysis on the environmental characteristics of primary schools (independent variables) and the outdoor noise levels (dependent variables) (Isparta, 2006)

	Outdoor noise levels (dBA)					
	L_{Aeq}		L_{Amin}		L_{Amax}	
	ß	95% CI	ß	95% CI	ß	95% CI
Number of all vehicle	0.01	-0.08-0.08	0.06*	0.01-0.13	-0.06	-0.17-0.05
Number of heavy vehicle	0.02	-0.27-0.32	-0.06	-0.30-0.17	0.04	-0.38-0.46
Percentage of heavy vehicle (low:0; medium:1; high:2)	5.62*	3.27-7.98	3.05**	1.16-4.94	5.59**	2.02-8.75
Other noise sources (none:0; passerby or construction:1)	2.12	-0.87-5.12	2.23	-0.17-4.64	4.44	0.17-8.72
Adjusted R square	0.66***	0.69***	0.38***			

ß: partial standardized regression coefficient. CI: Confidence Interval. *P<0.05, **P<0.01, ***P<0.001

The independent variables (the number of all the vehicles, the number of heavy vehicles and the percentage of heavy vehicles, the other noise sources) related to outdoor noise levels were entered in multiple regression models. Multiple regression analysis indicated that the level of 'percentage of heavy vehicle' were associated with LAeq, LAmin, LAmax (Table 4).

Discussion

Adults are responsible for providing good living, playing and learning environment for children. The necessity of providing students with appropriate learning atmosphere is incontrovertible. Certainly, atmospheric noise levels are important criteria for assessment of appropriate learning environment. Noise levels for various areas are identified according to the use of the area. U.S. Environmental Protection Agency suggests; the levels of 45 decibels are associated with indoor residential areas, hospitals and schools, whereas 55 decibels is identified for certain outdoor areas where human activity takes place[29]. Selected guideline values recommended by WHO for the environment to day-care settings and other situations in which children are frequently exposed to noise were 35 dB for school classrooms and preschool indoors and 55 dB for school playground outdoors (during play)[19] This figure is also mentioned in the new Building Bulletin[30] 93 as a 55 dB LAeq to encourage teachers to practice outdoor teaching within acceptable conditions for speech communication. In our country, according to current regulation of noise control[22] guideline values recommended were 35 dB for classroom and laboratories and, 65 dB for school outdoors. In Isparta, 48.8% of the schools under investigation have outdoor noise levels above 55 dBA and 2.3% of the school's outdoor environment receives noise that is above 65 dBA. In the study, Vilatarsana[31] evaluated the environmental noise exposure of schools around Heathrow. These frequencies were determined as 91% and 60% respectively. In Avsar and et al.[32] it was reported that the outdoor noise levels of 15% of primary schools in Istanbul pass over 65 dBA. Noise levels in Isparta were less than they are in the literature. Istanbul is the biggest and the most crowded city in Turkey. On the contrary, Isparta is a middle size city and not crowded as the big cities. This result may indicate that there is no problem in the research area in terms of outer noise level around the schools and this is the problem of bigger cities. However, when the recommended maximum limit of WHO (55 dBA) is considered[19], it is seen that almost half of the schools have unacceptable outer noise levels. This situation presents that the outer noise levels are a problem in the schools in the research area, and necessary measures must be taken.

One out of four schools, measured in the research, were situated on the main road in contrast to the regulations of Turkish standards[23,24]. All of these schools on the main road had a noise level above 55dBA. In the research area, it was seen that it was not conformed to the suggested standards concerning the emplacement of the schools. Presence of the schools on the main road brings about health risks such as exposure to exhaust fumes and traffic accidents as well as noise. More sensitivity should be shown to this subject during the choice of school location.

The distance of the road from the school is not correlated with the sound level in current study. On the contrary, in Avsar et al[20], the association between building-road distance and sound level is determined and they suggested as the safe distance between roadway and school building that the minimum required distances for two and three lanes for two-sided roads were about 111 and 175 m, respectively, without noise abatement barriers. In the same research, Avsar et al.[20] mentioned about coating material cost of the road near the school, its effect on the noise level, absorbing and reflecting effects of barriers near the school like trees, gardens and walls. In this research, there were barriers like trees, gardens and walls surrounding the schools that can absorbe or reflect the noise. The coatings of the roads near the schools were different. However, these properties were not evaluated or recorded during the study in definite standards. Thus, we can not be sure about the noise levels and their relations in this study. However, these barriers (which we have not recorded) may have blocked or neutralized the relation of distance and noise.

The first principle for preventing noise in children's settings is reducing or eliminating noise at the source.[6] The typical sources of noise reported in primary school outdoor environment are people's noise (talking, chatting, shouting, running etc. especially while playing or during sport or exercise) and transport noise of vehicles, wind noise[6]. Transportation noise is the main source of environmental noise pollution, including road traffic, rail traffic and air traffic. As a general rule, larger and heavier

vehicles emit more noise than smaller and lighter vehicles[33]. In this research, unvaried statistical analysis was used to determine the increase in measured outdoor noise levels (LAeq, LAmin, LAmax) in the presence of other noise sources, as the number of total vehicles passing near the school and percentage of heavy vehicles increased. However, it was determined that only the percentage of heavy vehicles was in correlation with all three variables in multiple analysis. In other words, the only parameter related to outer environment noise source is the proportion of heavy vehicles passing from the road, to the total number of vehicles passing from the road. This result shows the need for regulations about heavy vehicles, passing from the road, when considering regulations for the noise levels around schools.

Limitations

It should be noted that schools in which we carried out our study and evaluated our results were in a medium and developing city, in a rural area of Turkey. It had differences in terms of related environment, such as vehicle numbers and traffic crowd, when compared to urban and large cities. Therefore, it can be suggested that our results may show a more weightless tendency than big cities.

Level of perception of the sound emitted from outdoor noise sources is effected by construction materials used in the building, exterior and interior upholstery, presence of insulation on the ceiling and roof. The necessity of insulation and application of eligible materials is indubitable so as to lower the noise levels estimated or present at a distance of 1m. of exterior walls to the levels allowed indoors. Another limitation in this study is that, measurements and analysis of mere outdoor noise levels have been made and traffic intensity regarded as the source of this noise. The correlation of the sound perceived indoors to the outdoor noise or to the construction materials has not been investigated. In the forthcoming studies, factors concerning outdoor and indoor noise levels should be investigated.

Another limitation in this research is that the duration allowed either for measurement of noise or determination of vehicle number was short. However, the duration was cut short in order to make measurements at the same/similar climate conditions and during the same period (morning) of the day in a good many of the schools. The need for researchs, in which measurements are made in longer durations or continuously, is clear.

Conclusion

The analysis of the results has shown that schools in Isparta are chronically exposed to high noise levels. Noise levels exceed WHO recommendation of 55 dBA (LAeqt) in school playground, in 48.8% of the schools investigated. Furthermore 2.3% of the schools are exposed to noise events that regularly exceed 65 dBA. Schools in Isparta are exposed to noise levels lower than in big cities in Turkey. The noise level is related to the 'percentage of heavy vehicles' passing by the road near the school.

A decreased social behavior and quality of life in children exposed to noise (aircraft or road traffic noise) in schoolchildren were reported in literature[8,9,34]. These children are given education in the schools which have undesirable outdoor sound levels. This was determined in our study, face the risk of decrease in quality of life, due to the noise they are exposed to.

Even though researches about sound level sensed indoors and present outdoor noise level were made during the construction of the schools, their outdoor noise levels may alter and reach undesirable results due to the number of vehicles increasing each day and sometimes the nearby streets' getting busier, owing to the changes made in the traffic flow. That is why noise level in the environment of the school should be measured at certain intervals, to exercise necessary precautions.

In this respect, first of all, regulations such as diverting traffic to other roads during the opening hours of the school and not letting trucks, busses, and other heavy vehicles, that can produce excessive noise during these hours, should be made. Also, the measurements aimed at reducing the numbers of heavy vehicle passing by the school road, therefore reducing the source of sound, should be taken.

Due to the effect of noise especially on learning and memory as well as its possible well known effects on human, selection of an appropriate location is important during the construction of a school. Moreover, around the present schools, precautions concerning busy car traffic, particularly at school hours, should be taken to reduce the noise level to the least.

Competing interests

There were neither financial nor non-financial competing interests in the current study.

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Influence of Functional Food Products on Urinary Tract Infection

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Abstract

Objectives: Food products rich in pre- and/or probiotics may affect the frequency of urinary tract infection (UTI) by altering gastrointestinal tract (GIT) flora, because ascent of bacteria in stool constitute major etiological factors in UTI. The aim of this study was to assess the influence of consumption of functional food products rich in pre- or probiotics on the frequency of UTI in children.

Methods: This study was conducted on 96 children aged between 6 and 191 months who had UTI and 98 children aged between 7 and 192 months who presented with complaints other than UTI. Demographic characteristics were recorded and a questionnaire that included information about the frequency and amount of consumption of functional foods rich in pre- or probiotics was completed by the mothers of all children. Additionally frequency and amount of consumption of soft drinks, fruit juices, caffeinated beverages were recorded.

Results: Yoghurt was consumed more than three times a week by 59.2% and 54.6% of the control and disease groups respectively (p = 0.04). Consumption of sweets made from milk was significantly more frequent in the control group (consumption more than three times a week 22.4% vs 11.5%; p=0.03) whereas consumption of cacao was significantly more common in the UTI group (no consumption 73.2% vs 80.6%; p= 0.03).

Conclusion: As a result, consumption of functional food products rich in pre- or probiotics may have an influence on the development of urinary tract infection during childhood by altering GIT flora.

Key words: Functional foods, prebiotics, probiotics, urinary tract infection

Introduction

Microorganisms in gastrointestinal tract (GIT) constitute an important portion of the etiological agents of urinary tract infection (UTI) during childhood[1]. Since ascent of bacteria in stool have a major role in pathophysiology, dietary factors, especially food products rich in prebiotics like inulin, fructooligosaccharides, and galactooligosaccharides; or probiotics may affect the frequency of UTI by altering the GIT flora[2]. The term "functional foods" is defined as bacterial strains and plant and animal products that contain physiologically active compounds beneficial for human health.

Prebiotics are non-digestible food ingredients that beneficially affect the host by selectively stimulating the growth and/or activity of one or a limited number of bacteria in the colon. Probiotics are defined as live microorganisms which, when administered in adequate amounts, confer a health benefit on the host[3]. Functional food products rich in inulin and fructooligosaccharides include bananas, asparagus, garlic, leek, onion, artichoke and wheat [4]. Additionally, milk and milk products like yoghurt, cheese and sweets made from milk are rich in galactooligosaccharides[5,6]. Fermented milk products such as yoghurt and cheese are foods which also include probiotics.

Therefore, determination of the effect of consumption of these functional foods on UTI risk may contribute to the development of strategies of UTI management and prophylaxis. This kind of research has demonstrated that breastfeeding has a

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protective role against UTI during infancy due to many ingredients; some of them are prebiotics and probiotics[7-9]. The aim of this study was to assess the influence of consumption of functional food products rich in pre- or probiotics on the frequency of UTI in children.

Materials and Methods

The study group consisted of 96 children aged between 6 and 191 months (mean age ± standard deviation (SD), 76.4 ± 50.4 months) who presented to Celal Bayar University Department of Pediatric Nephrology between April 2004 and April 2005 with urinary tract complaints. Dysuria, frequency, loin pain and fever were diagnosed as having UTI upon physical examination and urinary culture results, of more than 105 colonies of a single microorganism[10]. Physical examination and evaluation of urinary culture results were performed by the same physician. Control group was composed of 98 children age and sex matched (aged 7 and 192 months, mean age ± SD, 71.6 ± 56.8 months) who presented to Pediatrics outpatient clinic of the same hospital with complaints other than urinary tract infection like upper viral respiratory tract infection. Patients in the control group had not received antibiotherapy during the last month and their ages and socioeconomic level was similar to the study group.

Parents were informed about the nature of the study and informed consent was obtained. Demographic characteristics of the children like age and sex were recorded and a questionnaire was completed by the mothers of all children. The questionnaire included information about the frequency and amount of consumption of functional foods rich in prebiotics like fructooligosaccharides and inulin like artichoke, celery, leek, onion, garlic as well as fruits like banana, strawberry, apple, pear, plums and orange. Similarly consumption of functional food products rich in galactooligosaccharides including milk, yoghurt (regular yoghurt without probiotic supplementation), cheese and sweets made from milk were also recorded. Additionally frequency and amount of consumption of soft drinks, fruit juices, and cacao were recorded. Coke, fanta and similar drinks were included in the soft drinks.

Frequency of consumption was classified as never, less than or equal to once a week, 1-3 times a week and more frequent than 3 times a week. Amount of consumption was recorded in terms of number of glasses for drinks, number of spoons of vegetables, number and size for fruits and number of slices for bread.

Statistical analysis was performed via SPSS 11.0 software (Chicago, IL). Frequency of consumption of various functional food products of the UTI and control groups was compared by the Pearson's chi square test. Age means of the two groups were compared by student's t test.

Results

Evaluation of the influence of all the food products questioned in this study on the frequency of UTI development revealed that, significant difference was present only between the consumption of yoghurt, sweets made from milk and cacao. Yoghurt was consumed more than three times a week by 59.2% and 54.6% of the control and disease groups respectively. The difference was statistically significant (p=0.04). Consumption of sweets made from milk was significantly more frequent in the control group when compared to the patient group (consumption more than three times a week 22.4% vs 11.5% respectively; p=0.03) whereas consumption of cacao was significantly more common in the UTI group (no consumption 73.2% vs 80.6% respectively; p=0.03) (Table 1). There was no significant difference in the consumption of other dietary elements (Table 2).

Table 1. Frequency of consumption of milk products and drinks in UTI and control groups

	UTI GROUP (n=96)				CONTROL GROUP (n=98)				
	Frequency of consumption				Frequency of consumption				
Food product	never	≤1 /week	1-3 /week	>3 /week	never	≤1 /week	1-3 /week	>3 /week	p
Milk	27.8	6.2	13.4	52.6	25.5	6.1	12.2	56.2	0.85
Yoghurt	17.5	8.3	19.6	54.6	17.3	-	23.5	59.2	0.04
Cheese	19.6	5.2	7.2	68	17.3	3.1	10.2	69.4	0.77
Sweet made of milk	29.1	37.5	21.9	11.5	16.3	36.8	24.5	22.4	0.03
Fresh fruit juice	64.9	10.3	13.4	11.4	68.4	7.1	9.2	15.3	0.64
Bottled fruit juice	28.1	19.8	18.8	33.3	34.7	15.3	17.3	32.7	0.85
Soft drinks	35.1	21.7	23.6	19.6	41.8	14.3	17.4	26.5	0.33
Tea	42.2	2.1	6.2	49.5	41.8	4.1	3.1	51	0.64
Cacao	73.2	10.3	6.2	10.3	80.6	-	8.2	11.2	0.03
Bran rich bread	80.2	4.2	2.1	13.5	86	7.6	3.2	3.2	0.54

*Percentage of the rows in UTI and control groups.

Table 2. Frequency of consumption of vegetables and fruits in UTI and control groups

	UTI GROUP (n=96)				CONTROL GROUP (n=98)				
	Frequency of consumption				Frequency of consumption				
Food product	never	≤1 /week	1-3 /week	>3 /week	never	≤1 /week	1-3 /week	>3 /week	p
Banana	20.6	30.9	22.7	25.8	19.4	24.5	24.5	31.6	0.70
Orange	20.6	9.3	14.4	55.7	32.6	6.1	8.2	53.1	0.22
Apple	11.3	9.3	17.5	61.9	13.3	6.1	14.3	66.3	0.46
Pear	48.5	14.4	17.5	19.6	41.8	9.2	19.4	29.6	0.39
Plumbs	36.2	14.4	24.7	24.7	36.7	14.3	28.6	20.4	0.97
Strawberries	23.7	22.7	24.7	28.9	24.7	22.6	36.2	16.5	0.17
Leek	62.9	35.0	2.1	-	64.4	33.6	1.0	1.0	0.66
Artichoke	80.5	17.5	1.0	1.0	88.8	10.2	1.0	-	0.5
Celery	78.4	19.5	-	2.1	68.4	28.6	1.0	2.0	0.48
Garlic	42.9	12.2	12.2	32.7	37.1	16.5	12.4	34	0.48
Onion	16.5	7.3	5.1	71.1	25.5	6.1	4.1	64.3	0.61

* Percentage of the rows in UTI and control groups.

Discussion

Immunonutriton or use of prebiotics and probiotics in the content of food products to support immune functions in different ways had been used since the early ages. This was applied in a more primitive way, in other words, as learned from older generations. However, lately, by the introduction of the concept of prebiotics and probiotics in functional foods, it has acquired a more scientific approach[11]. Many publications have reported that probiotics like lactobacilli compete with uropathogens from the rectum and perineum to inhibit their attachment and growth[12-15]. Recently, Kontiokari et al investigated the influence of dietary factors on UTI in adult women. They reported that consumption of fermented milk products containing probiotic bacteria ≥ 3 times/wk were associated with a decreased risk of recurrence of UTI[2]. Therefore, functional foods rich in prebiotics, which enhance growth of these nonpathogenic microorganisms and/or probiotics, may decrease the frequency of UTI. On the other hand, frequent or careless use of antibiotics may even increase the frequency of UTI due to their detrimental effect on the nonpathogenic microorganisms[16]. Functional food products may be used in preventative strategies in UTI because they are natural, safe agents without side effects.

In this study, frequency of consumption of yoghurt was significantly higher in the control group when compared to the UTI group. Yoghurt is a milk product that results from fermentation of lactic acid in milk by lactobacillus and its beneficial

effects are thought to be due to the changes it causes in GIT microflora. Moreover, yoghurt has immunostimulatory effects like increasing cytokine production, phagocytic activity, antibody production, T cell function, and natural killer activity[17]. It is rich in B vitamins, lactose, protein, lipid and minerals. B vitamins are essential for growth of lactobacilli that acts as a factor preventing growth and colonization of pathogenic strains of other bacteria. Higher concentration of conjugated linoleic acid, which has immunostimulatory effects, is also thought to be a factor[18]. It was first the Russian scientist Metchnikov who determined through his studies in 1907 that yoghurt is bacteriostatic[19]. As a conclusion yoghurt has a direct effect in favor of reduction of UTI frequency. Yoghurt was found to have a significant effect on reduction of UTI risk in an adults study by Kontiokari et al, too[2]. This effect of yoghurt may be attributed to its prebiotic and probiotic effects. In our study, except yoghurt, the only milk products that were found to be consumed significantly less frequently in the UTI group were sweets made from milk rich in galactooligosaccharides. Since this kind of a significant influence was not detected with most other milk products, we thought that the effect of yoghurt might be due to the prebiotic and also probiotic effects.

Although cacao and caffeinated beverages were reported not to have an influence on UTI frequency in adult females, consumption of cacao was found to be significantly more common in the UTI group, in our study[2]. Caffeinated beverages may lead to bladder instability so increase the frequency of UTI[20].

In our study, we failed to detect a significant influence of functional foods rich in fructooligosaccharides, on reduction of UTI frequency. One of the reasons for this difference of results in different studies may be related to the general consumption of vegetables and fruits in different populations. Vegetables like leek, artichoke, asparagus are not consumed daily in every meal by the Turkish population, therefore it may be difficult to determine its influence on the frequency of infection.

In our country, yoghurt has always been a traditional food item. However, with the changing eating-habits as a result of modern life style, the extent and amount of yoghurt consumption is not well known based on available data. The data presented in this study show one of the preventive effects of yoghurt toward infectious diseases. As such, it is crucial for public health that frequent and regular consumption of this important food item continues in our society. For this purpose, educational programs focusing nutrition for all the ages should focus on the benefits of yoghurt.

In conclusion, consumption of functional food products rich in prebiotics like galactooligosaccharides and probiotics may have an influence on the development of urinary tract infection during childhood. These food products may enhance growth of GIT flora and therefore inhibit growth and colonization of pathogenic microorganisms.

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Cancer Incidence in Izmir, Turkey, 1996-2000

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Introduction

The province of Izmir is in the extreme west of the Turkey, on the Aegean Sea. The population is 3.37 million (2000), making it the third largest city in Turkey; 81% of the population lives in urban areas, with the remaining 19% in rural areas. The area of the province is 11 530 km^2 and is divided into 28 districts (Refer to the Appendix: Population pyramid of Izmir for the years 1996-2000)

The Izmir Cancer Registry (ICR) is the first population-based cancer registry of Turkey. It was founded in May 1992 by the Ministry of Health, in collaboration with Ege University and the Turkish-American Collaboration for Health Research and Programming, University of Massachusetts. Currently, ICR is functioning as a subdivision of the Izmir Provincial Health Directorate and a body of support by the Turkish Ministry of Health, Department of Cancer Control. ICR has the duties of collecting, abstracting, coding, processing, analyzing and reporting of the cancer data in the Izmir province; organizing regular cancer registrar certification courses; and, supervising/auditing of the other recently founded cancer registries in Turkey. Organizational structure of the ICR and other details can be seen on the web sites[1,2,3]. First results from the Izmir Cancer Registry, Cancer Incidence in Izmir in the years 1993-94, has published as the first cancer incidence rates from Turkey in the year 2001[4].

Data Collection

The İzmir Cancer Registry (ICR) actively collects data on all new cases of cancer inhabiting in Izmir province from all the facilities in the city, including university hospitals (n = 3), state hospitals (metropolitan hospitals (n = 6), hospitals in the counties (n = 9), former SSK (Social Security Fund) hospitals (n = 4), municipality hospital (n = 1), other government run hospitals (n = 3), private hospitals (n = 9), private cancer centers (n = 6), and private pathology laboratories (n = 10). Data collection is done by 25-30 full time cancer registrars who have medical background and trained as cancer registrars through certification courses and on going in-service trainings. In total, nine hospitals have hospital-based cancer registries, from which the ICR receives data, directly. The staff of the hospital-based registries apply the same rules with ICR while collecting, abstracting and coding the data and are supervised by ICR. For all other sources, data collection is done actively, by full-time visits of medically certified/qualified registrars, who collect cancer data from medical records of the 15 hospitals, plus 12 clinics and laboratories, by using specially designed data abstraction forms. Registrars use various sources for data of cancer cases, including patient files from all clinics, clinical reports, patient lists and all electronic data. They take advice from clinicians when they need to and most of the centers collect data both on hardcopy and computers.

The ICR also receives data from 10 private pathology laboratories and 6 oncology centers; however, since most of these data have insufficient socio-demographic information (i.e., missing age, address...), they can not be included in the main database directly and instead they are used for the purpose of enhancing the accuracy and quality of available data.

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Rules

Cancer cases diagnosed by all methods are identified, and recorded. The cases registered include both invasive and in situ lesions, in all anatomical sites, including non-melanoma skin cancers and benign tumors of the brain. ICR collects information about all mandatory items[5,6]. The rules applied are derived from international standards for these items and details can be reached at http://mecc.cancer.gov/other/meccmanual-tur.pdf [7,8]. For the multiple primaries ICR accepted the recommendations of International Agency for Research or Cancer (IARC)/International Association of Cancer Registries (IACR) and European Networks of Cancer Registries (ENCR)[9,10,11].

Classification and Coding

The site, morphology and behavior of the tumors are coded using the Turkish translated form of International Classification of Diseases: Oncology, third edition (ICD-O-3) of the World Health Organization (WHO)[12].

Computer database management

All data collected are computerized using a customized version of the CANREG-4 software. CANREG-4 is the routinely used software developed especially for cancer registration by a division of World Health Organization: International Agency for Cancer Research (IACR). Turkish version of this software was developed and is updated regularly by ICR with close contacts to IARC. Canreg versions have the ability to internal consistency checks, checking database periodically, managing duplicate or multiple primary cases as it was mentioned in the quality control title below. Canreg 4 also has analytic capability for the basic operations for cancer registries such as performing incidence rates[13,14].

Linking up with death certificates

Similar to Turkey in general, mortality data in Izmir are incomplete, e.g. crude death rates are 5.2, 5.5, 5.3 and 5.1 respectively for 1997, 1998, 1999 and 2000[15] and notifications are possible solely for urban areas, with a problem of accuracy in regard to underlying cause of death. Although ICR collects data of death certificates referred to cancer obtained from Provincial Health Directorate records, these certificates are poor in quality and lack of information even for socio-demographic data and addresses. Matching these data with ICR database is quite difficult. Despite all these realities, ICR began to match death certificates with records of incident cases in a routine manner and has been processing them since 2005.

Quality control

The routine quality control processes, i.e. internal consistency checks, checking database periodically, managing duplicate cases are continuous tasks of ICR. Completeness and accuracy of the data have been evaluated continuously by the various methods for quality control in cancer registration by ICR itself[16]. Besides, the operation procedures and the data quality are supervised by the international bodies, i.e. IACR (International Agency for Research on Cancer), ENCR (European Network of Cancer Registries), MECC_(Middle East Cancer Consortium) for which ICR has a memberships.

Calculation of Rates

Cases

ICR collects data on all cases, including the data of non residents, which are diagnosed or treated in most of the data sources, needless to say that non residents are excluded during the incidence analysis. Only cancer cases who are inhabitants of Izmir province and who have incidence dates within the defined period consist the nominator of the incidence calculation. Crude, Age Standardized (using standard world population), age specific cancer incidence rates are routinely calculated by ICR with site and/or gender specific rates[17]. Izmir is a metropolitan attraction center of the Aegean Region of Turkey, with its advanced cancer diagnosis and treatment facilities. For this reason, quite few cases go to other provinces or abroad without any application to the institutions in Izmir and these cases can be neglected during incidence calculations.

Population of Izmir

For the calculation of the rates, as denominator (i.e. the population of İzmir), the mean of the 1996-2000 ETF (household based annual registration of the covered population routinely done by Primary Health Centers) results were used, as obtained from the Provincial Health Directorate, İzmir.

Results

Here, we present 1996-2000 results in four tables: Table 1 and 2 contain number of cases and relative frequencies for male and female; Table 3 and 4 contain age-specific, crude and age standardized (world standard population) incidence rates for male and female.

Appendix

Population Pyramid, IZMIR, 1996-2000

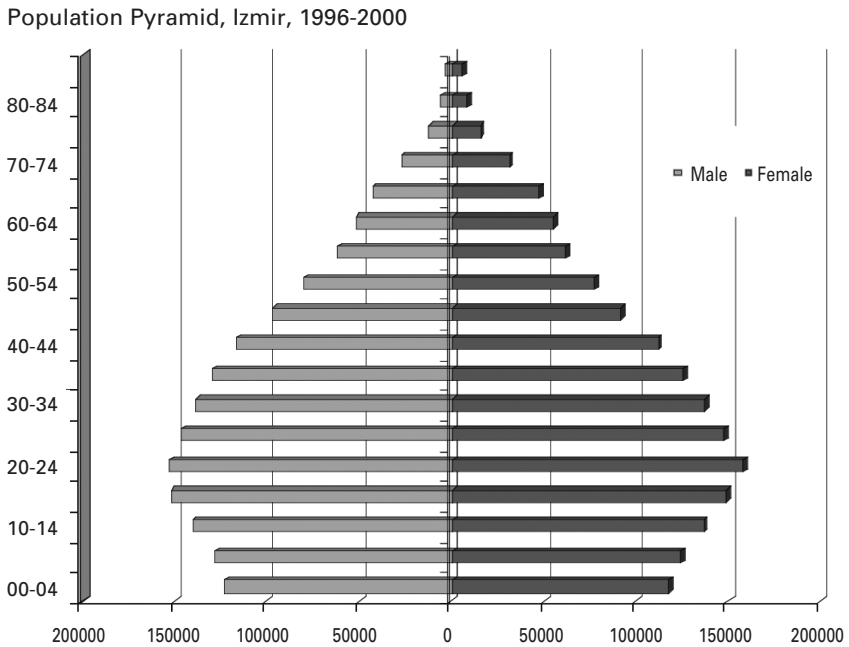

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Table 1. Number of Cases, IZMIR, 1996-2000, MALE

Site (Cont.)	All Ages	Age Unk.	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	% of Total	ICD (10th)
Lip	98	0	0	0	0	0	0	0	1	2	3	4	9	9	19	21	15	4	7	4	0.7%	C00
Tongue	60	0	0	0	0	1	0	3	1	3	3	5	7	11	7	5	10	1	2	1	0.4%	C01-C02
Mouth	51	0	0	1	0	0	0	1	0	1	3	3	8	5	10	6	9	3	0	1	0.4%	C03-C06
Salivary glands	39	0	0	0	0	0	1	3	1	2	2	4	5	5	4	5	1	4	1	1	0.3%	C07-C08
Tonsil	23	0	0	0	0	0	0	0	0	0	0	4	5	4	0	2	6	1	1	0	0.2%	C09
Other Oropharynx	11	0	0	0	0	0	0	0	1	1	0	2	1	2	1	0	3	0	0	0	0.1%	C10
Nasopharynx	90	0	0	2	4	3	3	6	2	5	6	11	13	11	5	5	9	4	1	0	0.6%	C11
Hypopharynx	53	0	0	0	0	0	1	0	1	1	3	8	10	4	8	7	7	2	1	0	0.4%	C12-C13
Pharynx unspec.	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0.0%	C14
Oesophagus	144	0	0	0	0	1	1	0	2	5	10	10	16	15	25	23	25	7	3	1	1.0%	C15
Stomach	748	2	0	0	0	0	2	2	16	16	58	51	85	86	106	153	99	54	13	5	5.2%	C16
Small intestine	27	0	1	0	0	0	0	0	0	0	1	5	1	4	7	4	3	0	1	0	0.2%	C17
Colon	487	0	0	0	0	0	2	6	12	19	28	42	45	65	53	81	77	35	13	9	3.4%	C18
Rectum	422	1	0	0	0	2	4	3	9	16	29	26	43	51	53	60	76	25	15	9	2.9%	C19-C20
Anus	23	0	0	0	0	0	1	0	1	2	2	3	1	1	4	5	0	1	2	0	0.2%	C21
Liver	215	1	3	0	0	0	1	3	6	5	12	13	22	39	31	42	24	10	2	1	1.5%	C22
Gallbladder etc.	104	1	0	0	0	0	1	2	1	1	4	11	4	15	14	22	14	9	2	3	0.7%	C23-C24
Pancreas	263	1	0	0	0	0	0	0	3	6	13	19	28	33	48	36	35	25	12	4	1.8%	C25
Nose, sinuses etc.	35	0	0	0	0	0	3	1	0	0	2	1	7	3	8	5	1	4	0	0	0.2%	C30-C31
Larynx	815	1	0	0	0	0	0	0	5	27	46	89	106	138	133	125	98	39	3	5	5.7%	C32
Trachea,Bronchus,Lung	5292	10	0	0	1	2	2	6	32	88	233	410	596	762	937	1039	787	283	73	31	36.8%	C33-C34
Other Thoracic organs	49	0	1	0	1	0	3	2	2	3	1	4	7	6	5	6	6	2	0	0	0.3%	C37-C38
Bone	77	0	0	2	8	17	9	5	6	8	2	6	6	3	2	1	2	0	0	0	0.5%	C40-C41
Melanoma of Skin	79	0	0	0	1	0	2	5	6	4	5	7	11	7	5	13	8	3	1	1	0.5%	C43
Other Skin	718	2	0	0	2	2	2	1	5	16	26	43	47	65	94	144	129	73	34	33	5.0%	C44
Mesothelioma	56	0	0	0	0	1	0	0	0	2	6	8	3	8	6	10	10	0	0	2	0.4%	C45
Kaposi sarcoma	10	0	0	0	0	0	0	1	0	0	0	0	0	0	3	4	0	2	0	0	0.1%	C46
Connective,Soft tissue	132	0	17	3	3	6	4	4	6	8	12	13	12	9	12	8	12	1	2	0	0.9%	C47;C49
Breast	61	0	0	0	0	0	0	0	0	3	5	8	7	5	10	14	5	2	2	0	0.4%	C50
Penis	2	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0.0%	C60
Prostate	749	0	0	0	0	0	0	0	0	2	1	4	27	50	122	185	195	106	37	20	5.2%	C61
Testis	197	2	3	0	2	11	24	42	33	37	13	14	6	4	3	0	2	0	0	1	1.4%	C62

Site (Cont.)	All Ages	Age Unk.	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	% of Total	ICD (10th)
Other male genital	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0.0%	C63
Kidney	204	0	9	1	0	0	0	1	3	6	13	16	22	31	35	33	29	5	0	0	1.4%	C64
Renal Pelvis	20	0	0	0	0	0	0	0	0	0	2	3	2	0	2	6	3	2	0	0	0.1%	C65
Ureter	7	0	0	0	0	0	0	0	0	1	0	0	0	1	3	1	0	0	0	1	0.0%	C66
Bladder	1064	1	0	0	0	1	4	2	10	14	25	59	92	134	183	190	180	104	47	18	7.4%	C67
Other Urinary organs	5	1	0	0	0	0	0	0	0	1	0	0	0	1	0	2	0	0	0	0	0.0%	C68
Eye	18	0	4	1	0	0	0	1	0	1	1	0	0	2	1	5	1	1	0	0	0.1%	C69
Brain, Nervous system	370	1	17	24	7	17	12	15	22	32	31	32	25	35	42	34	16	6	1	1	2.6%	C70-C72
Thyroid	75	0	0	0	2	0	2	4	4	5	7	5	6	7	12	11	4	4	2	0	0.5%	C73
Adrenal gland	19	0	8	1	0	1	0	1	0	1	1	1	1	2	0	1	1	0	0	0	0.1%	C74
Other Endocrine	4	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1	1	0	0	0	0.0%	C75
Hodgkin disease	103	0	3	4	10	7	6	5	9	12	11	6	7	6	7	6	3	1	0	0	0.7%	C81
Non-Hodgkin lymphoma	371	3	6	12	14	10	13	17	13	18	27	39	33	45	41	37	27	11	2	3	2.6%	C82-C85;C96
Immunoproliferative dis.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%	C88
Multiple Myeloma	122	0	0	0	0	0	0	1	1	3	8	4	22	22	20	19	15	6	0	1	0.8%	C90
Lymphoid Leukaemia	178	0	29	15	13	15	4	5	5	4	6	7	7	5	14	16	12	11	5	5	1.2%	C91
Myeloid Leukaemia	166	0	6	6	2	3	6	5	13	9	11	12	14	15	21	17	16	7	2	1	1.2%	C92-C94
Leukaemia unspec.	11	0	0	0	0	0	0	0	0	1	1	1	2	0	1	1	4	0	0	0	0.1%	C95
Other & unspecified	524	2	4	0	1	4	0	3	4	10	24	43	53	61	98	95	77	25	13	7	3.6%	Other
All sites Total	14394	29	111	72	71	105	113	157	237	401	697	1057	1424	1788	2216	2506	2058	883	300	169	100.0%	All
All sites but C44	13676	27	111	72	69	103	111	156	232	385	671	1014	1377	1723	2122	2362	1929	810	266	136	95.0%	Not C44

Table 2. Number of Cases, Izmir, 1996-2000, FEMALE

Site	All Ages	Age Unk.	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	% of Total	ICD (10^{th})
Lip	16	0	0	0	0	0	0	0	0	1	0	1	0	1	2	2	3	3	1	2	0.2%	C00
Tongue	41	0	0	0	0	0	0	0	2	5	1	2	4	3	8	7	3	4	0	2	0.5%	C01-C02
Mouth	46	0	0	0	0	0	1	0	0	2	2	3	4	2	9	12	6	3	0	2	0.5%	C03-C06
Salivary glands	21	0	0	0	0	0	0	1	0	2	1	3	3	2	2	2	5	0	0	0	0.2%	C07-C08
Tonsil	4	0	0	0	0	0	0	0	0	0	1	0	0	1	2	0	0	0	0	0	0.0%	C09
Other Oropharynx	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0.0%	C10
Nasopharynx	32	0	0	0	3	1	3	0	3	0	3	3	3	3	5	2	1	2	0	0	0.4%	C11
Hypopharynx	19	0	0	0	0	0	0	0	2	2	1	2	4	5	2	1	0	0	0	0	0.2%	C12-C13
Pharynx unspec.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%	C14
Oesophagus	81	0	0	0	0	0	0	1	1	2	8	5	8	15	10	13	13	5	0	0	0.9%	C15
Stomach	372	1	0	0	0	0	2	5	7	23	27	27	30	44	55	51	60	25	9	6	4.2%	C16
Small intestine	10	0	0	0	0	0	1	0	1	0	0	1	1	1	1	1	2	1	0	0	0.1%	C17
Colon	339	2	0	0	1	0	1	3	7	11	14	26	34	37	52	50	54	25	18	4	3.8%	C18
Rectum	290	0	0	0	0	1	3	1	9	5	19	25	36	28	41	39	51	17	11	4	3.3%	C19-C20
Anus	19	0	0	0	0	0	0	1	0	2	1	1	0	1	4	1	4	3	1	0	0.2%	C21
Liver	93	0	2	0	0	0	1	0	1	1	3	7	8	16	13	12	13	12	4	0	1.0%	C22
Gallbladder etc.	139	0	0	0	0	0	0	0	0	1	3	7	12	21	22	26	24	11	6	6	1.6%	C23-C24
Pancreas	173	0	0	1	0	1	0	1	1	4	9	8	12	18	30	34	27	17	5	5	1.9%	C25
Nose, sinuses etc.	15	0	0	0	0	0	0	0	0	0	1	1	1	2	1	2	4	2	1	0	0.2%	C30-C31
Larynx	40	0	0	0	0	0	0	1	0	2	2	7	4	4	7	9	3	1	0	0	0.4%	C32
Trachea,Bronchus,Lung	427	2	0	0	1	0	2	1	6	11	24	38	45	42	63	75	67	35	8	7	4.8%	C33-C34
Other Thoracic organs	9	0	0	0	0	0	0	0	0	0	1	3	1	0	1	1	1	1	0	0	0.1%	C37-C38
Bone	54	0	0	1	11	11	3	4	2	3	4	4	0	2	3	4	1	0	0	1	0.6%	C40-C41
Melanoma of Skin	78	0	0	1	0	0	3	2	0	3	10	8	6	9	7	9	12	5	3	0	0.9%	C43
Other Skin	576	0	0	0	0	2	2	7	6	16	14	34	38	43	71	98	119	56	36	34	6.5%	C44
Mesothelioma	31	0	0	0	0	0	0	0	0	1	3	3	5	7	4	6	1	0	0	1	0.3%	C45
Kaposi sarcoma	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	0	0.0%	C46
Connective,Soft tissue	120	0	11	4	2	6	4	9	8	7	12	9	10	9	10	8	6	3	2	0	1.3%	C47;C49
Breast	2606	5	0	0	0	1	7	36	131	240	338	384	359	261	291	241	202	66	28	16	29.3%	C50
Vulva	35	0	0	0	0	0	0	0	1	0	2	2	1	4	9	5	6	2	1	2	0.4%	C51
Vagina	13	0	0	0	0	0	0	0	0	1	2	0	1	4	0	2	2	0	0	1	0.1%	C52
Cervix Uteri	440	1	0	0	0	1	2	2	17	18	66	70	53	64	58	48	28	7	4	1	4.9%	C53

Site	All Ages	Age Unk.	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	% of Total	ICD (10th)
Corpus Uteri	470	0	0	0	0	0	0	1	5	10	26	55	68	64	89	72	47	26	5	2	5.3%	C54
Uterus unspec.	28	0	0	0	0	0	1	1	1	1	1	4	7	1	5	3	1	1	1	0	0.3%	C55
Ovary	397	1	0	2	7	7	5	7	16	19	46	43	52	55	51	47	26	11	1	1	4.5%	C56
Other Female Genital	13	0	0	0	0	0	0	0	1	1	1	3	2	0	2	1	1	1	0	0	0.1%	C57
Placenta	4	0	0	0	0	0	1	0	0	1	1	1	0	0	0	0	0	0	0	0	0.0%	C58
Kidney	112	0	4	2	1	0	2	1	1	4	4	9	16	9	20	16	13	7	2	1	1.3%	C64
Renal Pelvis	7	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	4	0	1	0	0.1%	C65
Ureter	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0.0%	C66
Bladder	99	0	0	0	0	0	0	0	0	3	4	5	4	9	19	14	19	9	10	3	1.1%	C67
Other Urinary organs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%	C68
Eye	28	0	8	1	1	0	0	0	3	1	4	0	3	1	2	2	2	0	0	0	0.3%	C69
Brain, Nervous system	235	1	11	12	12	3	10	13	17	10	16	17	22	20	29	20	13	7	2	0	2.6%	C70-C72
Thyroid	277	1	0	0	2	7	14	17	31	28	29	35	25	27	20	17	17	4	2	1	3.1%	C73
Adrenal gland	18	0	4	0	0	0	1	0	1	2	0	0	5	2	2	1	0	0	0	0	0.2%	C74
Other Endocrine	6	0	0	0	0	0	0	1	0	0	2	2	0	1	0	0	0	0	0	0	0.1%	C75
Hodgkin disease	60	1	0	1	7	9	5	4	3	4	5	5	4	2	2	3	1	4	0	0	0.7%	C81
Non-Hodgkin lymphoma	308	0	1	7	8	7	11	10	9	18	23	16	28	32	39	43	35	13	6	2	3.5%	C82-C85;C96
Immunoproliferative dis.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%	C88
Multiple Myeloma	90	0	0	0	0	0	1	0	1	2	4	4	13	13	12	15	14	7	2	2	1.0%	C90
Lymphoid Leukaemia	132	0	31	12	14	8	2	5	3	2	4	3	9	9	8	11	6	4	0	1	1.5%	C91
Myeloid Leukaemia	143	0	8	8	5	5	7	7	7	7	12	9	9	10	8	13	18	8	0	2	1.6%	C92-C94
Leukaemia unspec.	6	0	0	1	0	0	0	0	0	0	0	1	0	1	1	0	0	1	0	1	0.1%	C95
Other & unspecified	330	1	1	2	0	1	3	3	11	13	13	23	31	33	50	47	48	30	10	10	3.7%	Other
All sites Total	**8909**	**16**	**81**	**55**	**75**	**71**	**98**	**145**	**315**	**489**	**768**	**920**	**981**	**938**	**1143**	**1088**	**984**	**440**	**182**	**120**	**100.0%**	**All**
All sites but C44	**8333**	**16**	**81**	**55**	**75**	**69**	**96**	**138**	**309**	**473**	**754**	**886**	**943**	**895**	**1072**	**990**	**865**	**384**	**146**	**86**	**93.5%**	**Not C44**

Table 3. Incidence Rates, Izmir, 1996-2000, MALE

Site	All Ages	Age Unk.	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	Crude Rate	ASR*	ICD (10^{th})
Lip	98	0	0	0	0	0	0	0	0,1	0,3	0,5	0,8	2,3	2,9	7,3	9,7	10,9	6,2	24,3	22,7	1,2	1,4	C00
Tongue	60	0	0	0	0	0,1	0	0,4	0,1	0,5	0,5	1	1,8	3,5	2,7	2,3	7,2	1,6	7	5,7	0,7	0,8	C01-C02
Mouth	51	0	0	0,2	0	0	0	0,1	0	0,2	0,5	0,6	2	1,6	3,8	2,8	6,5	4,7	0	5,7	0,6	0,7	C03-C06
Salivary glands	39	0	0	0	0	0	0,1	0,4	0,1	0,3	0,3	0,8	1,3	1,6	1,5	2,3	0,7	6,2	3,5	5,7	0,5	0,5	C07-C08
Tonsil	23	0	0	0	0	0	0	0	0	0	0	0,8	1,3	1,3	0	0,9	4,3	1,6	3,5	0	0,3	0,3	C09
Other Oropharynx	11	0	0	0	0	0	0	0	0,1	0,2	0	0,4	0,3	0,6	0,4	0	2,2	0	0	0	0,1	0,1	C10
Nasopharynx	90	0	0	0,3	0,6	0,4	0,4	0,8	0,3	0,8	1	2,3	3,3	3,5	1,9	2,3	6,5	6,2	3,5	0	1,1	1,1	C11
Hypopharynx	53	0	0	0	0	0	0,1	0	0,1	0,2	0,5	1,6	2,5	1,3	3,1	3,2	5,1	3,1	3,5	0	0,7	0,7	C12-C13
Pharynx unspec.	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0,4	0	0	0	0	0	0	0	C14
Oesophagus	144	0	0	0	0	0,1	0,1	0	0,3	0,8	1,7	2,1	4	4,8	9,6	10,6	18,1	10,9	10,4	5,7	1,8	2	C15
Stomach	748	2	0	0	0	0	0,3	0,3	2,3	2,5	9,9	10,5	21	28	41	70,8	71,7	83,8	45,2	28,4	9,3	10,1	C16
Small intestine	27	0	0,2	0	0	0	0	0	0	0	0,2	1	0,3	1,3	2,7	1,9	2,2	0	3,5	0	0,3	0,4	C17
Colon	487	0	0	0	0	0	0,3	0,8	1,7	2,9	4,8	8,6	11	21	20	37,5	55,8	54,3	45,2	51,1	6	6,6	C18
Rectum	422	1	0	0	0	0,3	0,5	0,4	1,3	2,5	5	5,3	11	16	20	27,8	55,1	38,8	52,2	51,1	5,2	5,8	C19-C20
Anus	23	0	0	0	0	0	0,1	0	0,1	0,3	0,3	0,6	0,3	0,3	1,5	2,3	0	1,6	7	0	0,3	0,3	C21
Liver	215	1	0,5	0	0	0	0,1	0,4	0,9	0,8	2,1	2,7	5,5	13	12	19,4	17,4	15,5	7	5,7	2,7	2,9	C22
Gallbladder etc.	104	1	0	0	0	0	0,1	0,3	0,1	0,2	0,7	2,3	1	4,8	5,4	10,2	10,1	14		17	1,3	1,5	C23-C24
Pancreas	263	1	0	0	0	0	0	0	0,4	0,9	2,2	3,9	7	11	18	16,7	25,4	38,8	41,7	22,7	3,3	3,7	C25
Nose, sinuses etc.	35	0	0	0	0	0	0,4	0,1	0	0	0,3	0,2	1,8	1	3,1	2,3	0,7	6,2	0	0	0,4	0,5	C30-C31
Larynx	815	1	0	0	0	0	0	0	0,7	4,2	7,9	18,3	27	44	51	57,9	71	60,5	10,4	28,4	10,1	11	C32
Trachea,Bronchus,Lung	5292	10	0	0	0,1	0,3	0,3	0,8	4,6	14	40	84,3	149	244	359	481	570	439	254	176	65,6	72,7	C33-C34
Other Thoracic organs	49	0	0,2	0	0,1	0	0,4	0,3	0,3	0,5	0,2	0,8	1,8	1,9	1,9	2,8	4,3	3,1	0	0	0,6	0,6	C37-C38
Bone	77	0	0	0,3	1,1	2,2	1,2	0,7	0,9	1,2	0,3	1,2	1,5	1	0,8	0,5	1,4	0	0	0	1	0,9	C40-C41
Melanoma of Skin	79	0	0	0	0,1	0	0,3	0,7	0,9	0,6	0,9	1,4	2,8	2,2	1,9	6	5,8	4,7	3,5	5,7	1	1	C43
Other Skin	718	2	0	0	0,3	0,3	0,3	0,1	0,7	2,5	4,4	8,8	12	21	36	66,7	93,5	113	118	187	8,9	10,5	C44
Mesothelioma	56	0	0	0	0	0,1	0	0	0	0,3	1	1,6	0,8	2,6	2,3	4,6	7,2	0	0	11,3	0,7	0,8	C45
Kaposi sarcoma	10	0	0	0	0	0	0	0,1	0	0	0	0	0	0	1,1	1,9	0	3,1	0	0	0,1	0,1	C46
Connective,Soft tissue	132	0	2,8	0,5	0,4	0,8	0,5	0,5	0,9	1,2	2,1	2,7	3	2,9	4,6	3,7	8,7	1,6	7	0	1,6	1,8	C47;C49
Breast	61	0	0	0	0	0	0	0	0	0,5	0,9	1,6	1,8	1,6	3,8	6,5	3,6	3,1	7	0	0,8	0,8	C50
Penis	2	0	0	0	0	0	0	0	0	0	0	0,2	0	0,3	0	0	0	0	0	0	0	0	C60
Prostate	749	0	0	0	0	0	0	0	0	0,3	0,2	0,8	6,8	16	47	85,6	141	165	129	114	9,3	11,2	C61
Testis	197	2	0,5	0	0,3	1,4	3,1	5,7	4,8	5,7	2,2	2,9	1,5	1,3	1,1	0	1,4	0	0	5,7	2,4	2,1	C62

Site	All Ages	Age Unk.	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	Crude Rate	ASR*	ICD (10^{th})
Other male genital	2	0	0	0	0	0	0	0	0,1	0	0	0	0	0	0	0	0,7	0	0	0	0	0	C63
Kidney	204	0	1,5	0,2	0	0	0	0,1	0,4	0,9	2,2	3,3	5,5	9,9	13	15,3	21	7,8	0	0	2,5	2,8	C64
Renal Pelvis	20	0	0	0	0	0	0	0	0	0	0,3	0,6	0,5	0	0,8	2,8	2,2	3,1	0	0	0,2	0,3	C65
Ureter	7	0	0	0	0	0	0	0	0	0,2	0	0	0	0,3	1,1	0,5	0	0	0	5,7	0,1	0,1	C66
Bladder	1064	1	0	0	0	0,1	0,5	0,3	1,4	2,2	4,3	12,1	23	43	70	88	130	161	163	102	13,2	15,1	C67
Other Urinary organs	5	1	0	0	0	0	0	0	0	0,2	0	0	0	0,3	0	0,9	0	0	0	0	0,1	0,1	C68
Eye	18	0	0,7	0,2	0	0	0	0,1	0	0,2	0,2	0	0	0,6	0,4	2,3	0,7	1,6	0	0	0,2	0,3	C69
Brain, Nervous system	370	1	2,8	3,7	1	2,2	1,6	2	3,2	4,9	5,3	6,6	6,3	11	16	15,7	11,6	9,3	3,5	5,7	4,6	4,7	C70-C72
Thyroid	75	0	0	0	0,3	0	0,3	0,5	0,6	0,8	1,2	1	1,5	2,2	4,6	5,1	2,9	6,2	7	0	0,9	1	C73
Adrenal gland	19	0	1,3	0,2	0	0,1	0	0,1	0	0,2	0,2	0,2	0,3	0,6	0	0,5	0,7	0	0	0	0,2	0,3	C74
Other Endocrine	4	0	0	0	0	0,1	0	0,1	0	0	0	0	0	0	0	0,5	0,7	0	0	0	0	0,1	C75
Hodgkin disease	103	0	0,5	0,6	1,4	0,9	0,8	0,7	1,3	1,8	1,9	1,2	1,8	1,9	2,7	2,8	2,2	1,6	0	0	1,3	1,2	C81
Non-Hodgkin lymphoma	371	3	1	1,9	2	1,3	1,7	2,3	1,9	2,8	4,6	8	8,3	14	16	17,1	19,6	17,1	7	17	4,6	4,8	C82-C85; C96
Immunoproliferative dis.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	C88
Multiple Myeloma	122	0	0	0	0	0	0	0,1	0,1	0,5	1,4	0,8	5,5	7	7,7	8,8	10,9	9,3	0	5,7	1,5	1,6	C90
Lymphoid Leukaemia	178	0	4,7	2,3	1,8	2	0,5	0,7	0,7	0,6	1	1,4	1,8	1,6	5,4	7,4	8,7	17,1	17,4	28,4	2,2	2,6	C91
Myeloid Leukaemia	166	0	1	0,9	0,3	0,4	0,8	0,7	1,9	1,4	1,9	2,5	3,5	4,8	8	7,9	11,6	10,9	7	5,7	2,1	2,2	C92-C94
Leukaemia unspec.	11	0	0	0	0	0	0	0	0	0,2	0,2	0,2	0,5	0	0,4	0,5	2,9	0	0	0	0,1	0,1	C95
Other & unspecified	524	2	0,7	0	0,1	0,5	0	0,4	0,6	1,5	4,1	8,8	13	20	38	44	55,8	38,8	45,2	39,7	6,5	7,3	Other
All sites Total	14394	29	18	11	10	14	15	21	34	62	119	217	356	572	848	1160	1491	1371	1043	959	178,3	197,7	All
All sites but C44	13676	27	18	11	10	14	15	21	33	59	115	208	345	551	812	1093	1398	1257	925	772	169,4	187,2	Not C44

* Age Standardized Incidence Rate, World standard population

Table 4. Incidence Rates, Izmir, 1996-2000, FEMALE

Site	All Ages	Age Unk.	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	Crude Rate	ASR*	ICD (10^{th})
Lip	16	0	0	0	0	0	0	0	0	0,2	0	0,2	0	0,3	0,7	0,9	1,9	3,9	2,6	7,3	0,2	0,2	C00
Tongue	41	0	0	0	0	0	0	0	0,3	0,8	0,2	0,4	1	1	2,9	3	1,9	5,2	0	7,3	0,5	0,5	C01-C02
Mouth	46	0	0	0	0	0	0,1	0	0	0,3	0,4	0,7	1	0,6	3,2	5,1	3,9	3,9	0	7,3	0,6	0,6	C03-C06
Salivary glands	21	0	0	0	0	0	0	0,1	0	0,3	0,2	0,7	0,8	0,6	0,7	0,9	3,2	0	0	0	0,3	0,3	C07-C08
Tonsil	4	0	0	0	0	0	0	0	0	0	0,2	0	0	0,3	0,7	0	0	0	0	0	0,1	0,1	C09
Other Oropharynx	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0,4	0	1,3	0	0	0	0	C10
Nasopharynx	32	0	0	0	0,4	0,1	0,4	0	0,4	0	0,5	0,7	0,8	1	1,8	0,9	0,6	2,6	0	0	0,4	0,4	C11
Hypopharynx	19	0	0	0	0	0	0	0	0,3	0,3	0,2	0,4	1	1,6	0,7	0,4	0	0	0	0	0,2	0,2	C12-C13
Pharynx unspec.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	C14
Oesophagus	81	0	0	0	0	0	0	0,1	0,1	0,3	1,4	1,1	2,1	4,9	3,6	5,6	8,4	6,5	0	0	1	1	C15
Stomach	372	1	0	0	0	0	0,3	0,7	1	3,7	4,8	5,9	7,8	14	20	21,8	38,7	32,4	23,1	22	4,7	4,7	C16
Small intestine	10	0	0	0	0	0	0,1	0	0,1	0	0	0,2	0,3	0,3	0,4	0,4	1,3	1,3	0	0	0,1	0,1	C17
Colon	339	2	0	0	0,1	0	0,1	0,4	1	1,8	2,5	5,7	8,8	12	19	21,3	34,8	32,4	46,2	14,7	4,2	4,4	C18
Rectum	290	0	0	0	0	0,1	0,4	0,1	1,3	0,8	3,4	5,5	9,4	9,1	15	16,7	32,9	22,1	28,2	14,7	3,6	3,7	C19-C20
Anus	19	0	0	0	0	0	0	0,1	0	0,3	0,2	0,2	0	0,3	1,4	0,4	2,6	3,9	2,6	0	0,2	0,2	C21
Liver	93	0	0,3	0	0	0	0,1	0	0,1	0,2	0,5	1,5	2,1	5,2	4,7	5,1	8,4	15,6	10,3	0	1,2	1,2	C22
Gallbladder etc.	139	0	0	0	0	0	0	0	0	0,2	0,5	1,5	3,1	6,8	7,9	11,1	15,5	14,3	15,4	22	1,7	1,9	C23-C24
Pancreas	173	0	0	0,2	0	0,1	0	0,1	0,1	0,6	1,6	1,8	3,1	5,8	11	14,5	17,4	22,1	12,8	18,3	2,2	2,3	C25
Nose, sinuses etc.	15	0	0	0	0	0	0	0	0	0	0,2	0,2	0,3	0,6	0,4	0,9	2,6	2,6	2,6	0	0,2	0,2	C30-C31
Larynx	40	0	0	0	0	0	0	0,1	0	0,3	0,4	1,5	1	1,3	2,5	3,8	1,9	1,3	0	0	0,5	0,5	C32
Trachea,Bronchus,Lung	427	2	0	0	0,1	0	0,3	0,1	0,9	1,8	4,3	8,3	12	14	23	32	43,2	45,4	20,5	25,7	5,3	5,5	C33-C34
Other Thoracic organs	9	0	0	0	0	0	0	0	0	0	0,2	0,7	0,3	0	0,4	0,4	0,6	1,3	0	0	0,1	0,1	C37-C38
Bone	54	0	0	0,2	1,6	1,5	0,4	0,5	0,3	0,5	0,7	0,9	0	0,6	1,1	1,7	0,6	0	0	3,7	0,7	0,7	C40-C41
Melanoma of Skin	78	0	0	0,2	0	0	0,4	0,3	0	0,5	1,8	1,8	1,6	2,9	2,5	3,8	7,7	6,5	7,7	0	1	1	C43
Other Skin	576	0	0	0	0	0,3	0,3	0,9	0,9	2,6	2,5	7,5	9,9	14	26	41,8	76,7	72,7	92,3	125	7,2	7,6	C44
Mesothelioma	31	0	0	0	0	0	0	0	0	0,2	0,5	0,7	1,3	2,3	1,4	2,6	0,6	0	0	3,7	0,4	0,4	C45
Kaposi sarcoma	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0,4	0,6	0	5,1	0	0,1	0,1	C46
Connective,Soft tissue	120	0	1,9	0,6	0,3	0,8	0,5	1,2	1,2	1,1	2,2	2	2,6	2,9	3,6	3,4	3,9	3,9	5,1	0	1,5	1,5	C47;C49
Breast	2606	5	0	0	0	0,1	0,9	4,9	19	38	61	84,2	93	85	105	103	130	85,6	71,8	58,6	32,6	32,1	C50
Vulva	35	0	0	0	0	0	0	0	0,1	0	0,4	0,4	0,3	1,3	3,2	2,1	3,9	2,6	2,6	7,3	0,4	0,5	C51
Vagina	13	0	0	0	0	0	0	0	0	0,2	0,4	0	0,3	1,3	0	0,9	1,3	0	0	3,7	0,2	0,2	C52
Cervix Uteri	440	1	0	0	0	0,1	0,3	0,3	2,5	2,9	12	15,3	14	21	21	20,5	18,1	9,1	10,3	3,7	5,5	5,5	C53

Site	All Ages	Age Unk.	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	Crude Rate	ASR*	ICD (10^{th})
Corpus Uteri	470	0	0	0	0	0	0	0,1	0,7	1,6	4,7	12,1	18	21	32	30,7	30,3	33,7	12,8	7,3	5,9	6,1	C54
Uterus unspec.	28	0	0	0	0	0	0,1	0,1	0,1	0,2	0,2	0,9	1,8	0,3	1,8	1,3	0,6	1,3	2,6	0	0,4	0,4	C55
Ovary	397	1	0	0,3	1	0,9	0,6	0,9	2,3	3	8,3	9,4	14	18	18	20,1	16,8	14,3	2,6	3,7	5	5	C56
Other Female Genital	13	0	0	0	0	0	0	0	0,1	0,2	0,2	0,7	0,5	0	0,7	0,4	0,6	1,3	0	0	0,2	0,2	C57
Placenta	4	0	0	0	0	0	0,1	0	0	0,2	0,2	0,2	0	0	0	0	0	0	0	0	0,1	0	C58
Kidney	112	0	0,7	0,3	0,1	0	0,3	0,1	0,1	0,6	0,7	2	4,2	2,9	7,2	6,8	8,4	9,1	5,1	3,7	1,4	1,5	C64
Renal Pelvis	7	0	0	0	0	0	0	0	0	0	0	0,2	0	0	0,4	0	2,6	0	2,6	0	0,1	0,1	C65
Ureter	1	0	0	0	0	0	0	0	0	0	0,2	0	0	0	0	0	0	0	0	0	0	0	C66
Bladder	99	0	0	0	0	0	0	0	0	0,5	0,7	1,1	1	2,9	6,9	6	12,3	11,7	25,6	11	1,2	1,3	C67
Other Urinary organs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	C68
Eye	28	0	1,4	0,2	0,1	0	0	0	0,4	0,2	0,7	0	0,8	0,3	0,7	0,9	1,3	0	0	0	0,4	0,4	C69
Brain, Nervous system	235	1	1,9	1,9	1,8	0,4	1,3	1,8	2,5	1,6	2,9	3,7	5,7	6,5	11	8,5	8,4	9,1	5,1	0	2,9	3	C70-C72
Thyroid	277	1	0	0	0,3	0,9	1,8	2,3	4,5	4,5	5,2	7,7	6,5	8,8	7,2	7,3	11	5,2	5,1	3,7	3,5	3,3	C73
Adrenal gland	18	0	0,7	0	0	0	0,1	0	0,1	0,3	0	0	1,3	0,6	0,7	0,4	0	0	0	0	0,2	0,3	C74
Other Endocrine	6	0	0	0	0	0	0	0,1	0	0	0,4	0,4	0	0,3	0	0	0	0	0	0	0,1	0,1	C75
Hodgkin disease	60	1	0	0,2	1	1,2	0,6	0,5	0,4	0,6	0,9	1,1	1	0,6	0,7	1,3	0,6	5,2	0	0	0,8	0,7	C81
Non-Hodgkin lymphoma	308	0	0,2	1,1	1,2	0,9	1,4	1,4	1,3	2,9	4,1	3,5	7,3	10	14	18,4	22,6	16,9	15,4	7,3	3,9	3,9	C82-C85; C96
Immunoproliferative dis.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	C88
Multiple Myeloma	90	0	0	0	0	0	0,1	0	0,1	0,3	0,7	0,9	3,4	4,2	4,3	6,4	9	9,1	5,1	7,3	1,1	1,2	C90
Lymphoid Leukaemia	132	0	5,3	1,9	2,1	1,1	0,3	0,7	0,4	0,3	0,7	0,7	2,3	2,9	2,9	4,7	3,9	5,2	0	3,7	1,7	1,9	C91
Myeloid Leukaemia	143	0	1,4	1,3	0,7	0,7	0,9	0,9	1	1,1	2,2	2	2,3	3,2	2,9	5,6	11,6	10,4	0	7,3	1,8	1,8	C92-C94
Leukaemia unspec.	6	0	0	0,2	0	0	0	0	0	0	0	0,2	0	0,3	0,4	0	0	1,3	0	3,7	0,1	0,1	C95
Other & unspecified	330	1	0,2	0,3	0	0,1	0,4	0,4	1,6	2,1	2,3	5	8,1	11	18	20,1	31	38,9	25,6	36,7	4,1	4,3	Other
All sites Total	8909	16	14	9	11	10	12	20	46	78	138	202	255	305	413	465	634	571	467	440	111.6	113.3	All
All sites but C44	8333	16	14	9	11	9	12	19	45	75	135	194	245	291	387	423	558	498	374	315	104.4	105.7	Not C44

* Age Standardized Incidence Rate, World standard population

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Global Health Council- World Vaccine Congress	08-10 October 2007	Lyon	France	julie.phillips@terrapinn.com
2007 LEADERSHİP SEMİNAR (American College of Nurse-Midwives)	13-14 October 2007	Washington	Seattle	rmcclain-fields@acnm.org
Global Forum for Health Research Equitable Access: Research challenges for health in developing countries	29 October-2 November 2007	Beijing	China	info@globalforumhealth.org
International Education for Peace Conference	14-17 November 2007	Vancouver	Canada	http://www.efpinternational.org/conference2007/
Making Connections: A Canadian Cancer Research Conference Celebrating NCIC's 60th Anniversary	15-17 November 2007	Toronto	Canada	http://www.ncic.cancer.ca/ncic/internet/standard/0,3621,84658243_1483513437__langId-en,00.html
The 5th World Melioidosis Congress	21-23 November	Khon Kaen	Thailand	http://www.wmc2007.org/
Global Forum For Health Research Equitable Access: Research Challenges For Health İn Developing Countries	29 October-2 November	Beijing	China	info@globalforumhealth.org
Indian Society for Medical Statistics Silver Jubilee National Conference	30 November 2007 to 2 December 2007	Manipal	India	http://www.manipal.edu/ISMSConference-2007/
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