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CHRONIC DISEASES AND RISK FACTORS SURVEY IN TURKEY

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CHRONIC DISEASES AND RISK FACTORS SURVEY IN TURKEY

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INTRODUCTION

20th century witnessed extensive health struggle, developed towards communicable diseases worldwide. In the present century, as chronic diseases have become the leading cause of mortality and morbidity in our country and worldwide due to the increase of life expectancy, bringing new approaches in the field of health is brought to agenda. Chronic diseases are defined as “conditions that can not be cured completely and that do not show improvement”. Chronic diseases increase rapidly both in developed and underdeveloped countries; they challenge available health care services and cover a major part of budget, allocated to health. The fight against risk factors, causing chronic diseases, succeeds through developing national policies and long-term strategies.

Prevalence of chronic diseases increases rapidly, rank among the leading causes of mortality and disability worldwide. In 2008, of the 57 million deaths that occurred globally, 36 million – almost two thirds – were due to non-communicable diseases, comprising cardiovascular diseases, cancers, diabetes and chronic lung diseases. Similar to the situation in the world, prevalence of chronic diseases and their risk factors increase gradually in Turkey. Studies, carried out so far, are not inclusive in country level and do not comprise the scale of all chronic diseases and their risk factors. Therefore, it is required to determine the prevalence of chronic diseases and their risk factors

in national level in Turkey and to develop proper responses accordingly.

Chronic Diseases and Risk Factors Survey in Turkey is carried out provide data, required in national level, to present a shared vision and roadmap to prevent and control chronic diseases and to respond to growing threat more strongly.

I would like to express my sincere appreciation to all, contributed to this valuable study, which shall contribute health policies and strategies that shall be performed with the principle of equal, qualified, modern and sustainable health care service to all and wish that successful studies, aiming to provide more healthy, both mentally and physically, and qualified life with the help of this and similar studies.

Mehmet MÜEZZİNOĞLU, MD
Minister of Health

PREFACE

The prevalence of non-communicable diseases and its share among causes of death increase in our country as worldwide. Current information and experiences show that a majority of diseases and deaths can be prevented with effective interventions at the community or individual. For planning and implementing initiatives towards community, feasible and evidence-based policies in compliance with the country's infrastructure with specified targets are required. Epidemiologic data and information are necessary to evaluate the effectiveness of interventions implemented at the community level.

Data on communicable diseases, immunization and maternal and infant health that constituting priority health issues of our country, have been collected for a long period of time in Turkey. In addition, validation of routine data and completing deficient areas continue with cross-sectional survey, carried out in specified intervals. However, studies for effective data collection system for non-communicable diseases are continuing.

Chronic Diseases and Risk Factors Survey in Turkey is a cross-sectional survey, carried out with the aim of collecting continuous data model on non-communicable diseases and their risk factors. It is carried out with a unique design, implemented for the first time in our country. A sample from the population registered in all family physicians in Turkey was selected and data were recorded to Family Medicine Information System by family physicians. The survey includes information about chronic disease and their leading risk factors as well as biochemical analyses in blood and urine, anthropometric measurements and results of pulmonary function tests. In this national survey, data were collected quickly and cost-efficiently since available Family Medicine Information System was used.

With the survey, in addition to determining the prevalence of chronic diseases and their risk factors, it is aimed to determine the framework of surveillance tasks of family physicians in this field and to take a step towards integrating this to their daily routine. In the survey, there are twenty sections in the study, including introduction and method. A section is separated for each disease or risk factor. Findings are presented according to age, gender, 12 NUTS regions and urban/rural settlement.

We wish that the results of the survey are used in planning, implementing and monitoring noncommunicable disease control programs, carried out in Turkey, and shall be helpful in establishing indicators, required in international comparisons and shall form basis in monitoring chronic diseases in primary health care and in preparing prevention programs.

Editors

Prof. Belgin ÜNAL MD, Prof. Gül ERGÖR MD



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ABBREVIATIONS

%	Percent
°C	Celsius
AHA	American Heart Association
AP	Angina Pectoris
BMI	Body-Mass Index
BOLD	Burden of Obstructive Lung Disease
CI	Confidence Interval
CREDİT	Chronic Renal Disease In Turkey
cm	Centimeter
CAD	Coronary Artery Disease
CHD	Coronary Heart Disease
CMR	Crude Mortality Rate
COPD	Chronic Obstructive Pulmonary Disease
CVA	Cerebrovascular Accident
CVD	Cardiovascular Disease
DALY	Disability Adjusted Life Years
DBP	Diastolic Blood Pressure
DHS	Turkey Demographic and Health Survey
DM	Diabetes Mellitus
ECRHS	European Community Respiratory Health Survey
EQ5D	EURO-QoL-5 Dimensions Scale
EUROSTAT	European Community Statistical Office
FPG	Fasting Plasma Glucose
FHC	Family Health Center
FHU	Family Health Units
FP	Family Physician
FPIS	Family Physician Information System
GARD	Global Alliance Against Chronic Respiratory Diseases
GATS	Global Adult Tobacco Survey
GE	Gastroesophageal
HDL	High Density Lipoprotein
ICD-10	International Statistical Classification of Diseases and Related Health Problems
IDF	International Diabetes Federation
IFG	Impaired Fasting Glucose
IGT	Impaired Glucose Tolerance
Kg	Kilogram
LDL	Low Density Lipoprotein
METSAR	Turkey Metabolic Syndrome Study
MS	Metabolic Syndrome
mg/dl	Miligram/Desiliter
mm/Hg	Milimetre/Mercury



mmol/l	Milimol/liter
MONICA	Multinational Monitoring of Trends and Determinants in Cardiovascular Disease
N	Number
NBD-CE	National Burden of Disease and Cost Effectiveness Study
NCD	Noncommunicable Diseases
NH	Non Hodgkin
NUTS	Nomenclature of Units for Territorial Statistics
OGTT	Oral Glucose Tolerance Test
PatenT	Turkish Hypertension Prevalence Study
PLATINO	Proyecto Latinamericano de Investigación en Obstrucción Pulmonar
PFT	Pulmonary Function Test
PTCA	Percutaneous Transluminal Coronary Angioplasty
QALY	Quality Adjusted Life Years
SBP	Systolic Blood Pressure
SD	Standart Deviation
SPSS	Statistical Package for the Social Sciences
STEPS	STEPwise approach to chronic disease risk factor surveillance
TBC	Tuberculosis
TC	Turkish Republic
TEKHARF	Turkish Adult Risk Factor Study
TG	Triglyceride
THINK	Stroke Risk in Hypertansive Patients in Turkey Research
TIA	Transient Ischemic Attack
TNSA	Turkey Population and Health Research
TKrHRF	Turkey Chronic Diseases And Risk Factors Survey
TURDEP	Turkey Diabetes Epidemiology Study
TURKSTAT	Turkish Statistical Institute
UHY-ME	National Disease Burden and Cost Effectiveness
USA	United States of America
VAS	Visual Analogue Scale
WHO	World Health Organization
WHR	Waist to Hip Ratio

1-2

Introduction and Methods





1 Introduction

Professor Gül ERGÖR

Cardiovascular diseases, cancers, chronic respiratory tract diseases and diabetes comprise the major non-communicable diseases that affect all population today. Non-communicable diseases are increasing, in all countries, as a result of the demographic and the epidemiologic transformation. It has been confirmed that chronic diseases, a global health issue, are responsible for the 63% of the 57 million deaths occurred in 2008 (1).

Chronic diseases are no longer the problem of developed countries, as it is supposed to be. It has been stated that more than 80% of the deaths by chronic diseased occur in low and mid-income countries. The projections show that the number of deaths by chronic diseases will be approximately 41 million in 2015 (2).

Mortality and morbidity data show that there is a rising trend of noncommunicable diseases in developing countries. More than 80% of deaths due to cardiovascular diseases and diabetes, more than 90% of deaths due to chronic obstructive pulmonary disease, more than two thirds of cancer deaths occur in developing countries. Noncommunicable diseases can also lead to premature death. Death rate under the age of 60 due to noncommunicable diseases was 29% in developing countries, while was found to be 13% in developed countries (3).

Today, research intended at preventing chronic diseases are conducted specifically in developed countries. The health services in the developing countries are structured to fight against acute infection diseases instead of chronic diseases. Since the chronic diseases are the ones with heavy economic and social burden to the individual and the society, there is a need for health policies and active initiatives for controlling these diseases. If the present scientific knowledge and experiences about the chronic diseases and their risk factors could be made into practice by combining them with the effort of all the countries, the burden of the diseases on the society may be reduced dramatically. It is anticipated that 36 million deaths could be prevented, if the rate of death from chronic diseases could be reduced by 2% every year with active initiative during 2005-2016 (4).

Our country should be prepared for fighting chronic diseases due to the aging population and the changing life-style. TURKSTAT's death statistics show that the rate of heart diseases among all deaths has been increasing gradually. Heart diseases took the first place among all causes of death by 40% in 1989, 45% in 1993 (5), and 40% in 2009 (6).

When other chronic diseases except heart diseases are taken into consideration, it is seen that chronic diseases comprise 75% of all deaths. If the mortality and morbidity is are to be evaluated together, among the first 10 causes of DALY, ischemic heart diseases take the second place and cerebrovascular diseases



the third. Life years lost due to ischemic heart diseases comprise %8 of all deaths, and life years lost due to cerebrovascular diseases 6%. With regard to the basic disease groups, non-communicable diseases comprise the major part of the DALY loss with a rate of 63.9% (7).

Noncommunicable diseases can be prevented with interventions targeting four major risk factors including smoking, physical inactivity, unhealthy diet and alcohol consumption.

Noncommunicable disease control programs need a common approach and coordination in terms of preventive, curative and rehabilitative services in the primary, secondary and tertiary health care settings. With disease control systems how the common care and coordination would be provided in all health services for individuals and the society should be determined.

Reliable and up-to-date epidemiologic data are essential to plan, monitor and evaluate the intervention programs for NCD. However, surveillance systems are quite limited or even do not exist in developing countries. Therefore, surveillance system should be established and strengthened for the noncommunicable diseases. Surveillance system should be configured to allow especially changes in behavioral and metabolic risk factors to monitor changes in disease and death (3).

The goal of “Decreasing prevalence of non-communicable diseases and the rate of deaths by these by reducing the risk factors which cause these diseases to develop” appeared in the 2010-2014 Strategic Plan of the Ministry of Health. Following this, Department of Non-communicable Diseases and Chronic Situations was founded at the Directorate General of Primary Health Services. The study named “Determination Research on Prevalence and Risk Factors of Chronic Diseases in Turkey” conducted by this department is the Pilot Survey for a system that would make a major contribution to develop a surveillance system for chronic diseases and to build a permanent and continuous database for risk factors. The study will also provide for obtaining basic information to be used in planning and developing interventions, providing support for reducing the diseases and their risk factors, and evaluating the efficiency of the interventions. Ministry of Health was reconstituted by the Statutory Decree about the Organisation and Functions of Ministry of Health and Subsidiaries, No 633, date 02 November 2011. Turkey Public Health Institution was reconstituted as “Department of Chronic Diseases, Geriatric Health and Handicapped as subsidiary, and as “Non-communicable diseases, programs and cancer unit” in provincial organisation depending on the size of provinces. This constitution the Department was assigned the duties of protection and improvement of public health, risk factor management, preparation of programs for communicable, non-communicable and chronic diseases and improvement of the health of all individuals in the society by getting them to adopt habits that would improve their life quality.

The diseases covered by the study are the first 20 chronic diseases in the disease burden and cause of death ranking, listed in the Turkey Disease Burden and Cost-Efficiency study completed in 2004. The study is planned as it would cover the major risk factors such as blood pressure, smoking, physical activity deficiency, obesity, healthy/balanced diet and alcohol.

Period prior to the preparation of this study, “Size and Risk Factors of Chronic Diseases in Turkey Study Methods and Questionnaire Development” report was prepared. In this detailed report, a detailed literature review was conducted to create rationale and methods for such a study. The main reviews in the field of chronic diseases mentioned below are discussed in this report.



During the study, the required data and method of the research have been determined by conducting a meta-analysis on the internationally accepted literature on Chronic Diseases and Risk Factors, related to evidence-based public health studies, and evaluating the international organizations conducting research in this field [such as Centers for Disease Control-CDC (Behavioural Risk Factor Surveillance System-BRFSS), WHO (Countrywide Integrated Noncommunicable Diseases Intervention-CINDI, Multinational MONItoring of trends and determinants in Cardiovascular disease MONICA, Global Adult Tobacco Survey-GATS, Stepwise Surveillance-STEPS, European Commission Statistics Unit-EUROSTAT), Northern Karelian Project, INTERHEART Study, FRAMINGHAM Study] and national studies (Ministry of Health, Household People Research 2003, TURKSTAT Turkey Health Survey 2008, TEKHARF-Turkish Adult Risk Factor Study, TURDEP-Turkey Diabetes Epidemiology Research, TNSA- Turkey Population and Health Research, THINK-Stroke Risk in Hypertensive Patients in Turkey Research, Prevalence of Hypertension in Turkey study, METSAR-Turkey Metabolic Syndrome Study, Turkey Mental Health Profiling Study).

The STEPS approach of the WHO, which covers all non-communicable diseases and risk factors and which can be applied in primary health care, is an approach that aims at gathering all the basic data pertaining to risk factors. This basic data should be collected in order to start and maintain the chronic disease surveillance. The approach comprises of three steps as survey form, physical examination and biochemical analyses. By using standard procedures it is both possible to maintain national surveillance in all countries, and to make a comparison between countries (8). It is seen fit to add some questions for determining the prevalences of some important non-communicable diseases in addition to the survey form mentioned above.

Turkey Chronic Diseases and Risk Factors Prevalence study has been started by Ministry of Health, Directorate General of Primary Health Care, Non-communicable Diseases and Chronic Situations Department, later on it has been conducted by Turkey Public Health Institution Department of Chronic Diseases, Geriatric Health and Disabled. This report comprises the tools and methods pertaining to the planning, conduct and analysis of Turkey Chronic Diseases and Risk Factors Prevalence Study. The research conducted in this study and the documents prepared are presented in this report.

Aims

This study aims at determining the prevalence related to the chronic diseases, chronic situations and their risk factors in Turkey, and presenting their distribution with regard to age, sex, and regions.

Long- term aims of the study;

- To establish a cohort and panel data in order to follow-up chronic diseases and risk factors
- To develop surveillance system for NCDs and their risk factors
- To help in establishment of diagnosis, treatment and management services for NCDs in primary care level
- To provide data on NCDs and risk factors that can be used for planning, implementing and evaluating the effectiveness of the interventions for NCD control



2 Methods

Professor Gül ERGÖR

2.1 Sample and Sampling Methods

Since the Family Practice application had started in 2010 in 81 provinces in Turkey, all population of Turkey were registered to family physicians and in this process the demographic data was updated in cooperation with TURKSTAT. Also, the presence of a database in the Family Physician Information System (FPIS) used by FP, and all populations' being registered in this database provided for implementing a sampling method that is to be used for the first time in Turkey.

The sample size was calculated to determine 1% prevalence (p) with a 0.15% deviation (d). In this case, the smallest sample size was determined as 16,622. It was decided that the 20,044 family physicians who were on duty at the date of sample determination to interview 2 individuals from their list. Although it was sufficient for the FPs to interview only one patient with regard to the calculated sample size, sampling size were doubled considering the possible failures to reach the interviewees, to avoid replacement.

The list comprising the sample population includes 73.7 million individuals. The population registered to a family physician comprises of approximately 3500 individuals. After determining the population over 15 years of age registered in the FPIS, this list was delivered online to TURKSTAT by the Ministry of Health Information Technology Coordination Office. To this database, the information about the ratio of the population over 15 years of age registered to a family physician to the total population registered to the same FP and the residence information were added. The individuals in the list were sorted according to the 20,044 FP they were registered to. TURKSTAT determined the two individuals from each FP list by random sample method. In addition to the list of individuals selected with regard to the addresses of the FP's, the 1st degree (12 regions) and 2nd degree (26 regions) NUTS regional codes were added. This database was delivered to the Ministry of Health Information Technologies Coordination Office. The individuals in the sample were reported to the FPs via web using the FPIS.

2.2 Variables

- Descriptive variables (age, sex, marital status, income status, family type, place of residence, number of people in the household, employment status, house-ownership, house type, childbearing history)
- Risk Factors (Smoking, alcohol consumption, some nutritional habits, physical activity)
- Family History
- Personal Medical History (Symptom history, Disease history)



- Chronic Health Issues (Angina pectoris, infarction, congestive heart failure, hypertension, diabetes, hyperlipidemia, chronic kidney failure, asthma, COPD, depression, CVA/Stroke, transient ischemic attack, epilepsy, migraine, dementia/Alzheimer's disease, Parkinson's disease, allergic diseases, gastroesophageal reflux, tuberculosis, cancer and accidents)
- Quality of life
- Depression, somatization, panic attack
- Physical Examination/Findings
- Measurements and Examinations (Height, body weight, waist circumference, hip circumference, pulse, blood pressure, blood glucose, blood lipids, complete urinalysis, spirometry)

2.3 Data Collection Method

The study was conducted with the help of the family physicians as part of the duty, power and responsibilities defined in Article 4 (conducts periodical health examination, conducts monitoring and screening for age, sex and disease groups of the registered individuals – cancer, chronic diseases, adult and elderly health, etc.-, gives protective health services and primary diagnosis, treatment, rehabilitation and consultation services to the individuals registered who are handicapped, old or bedridden, during performing domiciliary or mobile/on-site care); and with the help of family health staff's part of the duty, power and responsibilities defined in Article 5 (measures and records the vital signs of the individuals, and takes samples for required examinations. Family Physicians (FP) invited two individuals selected to the Family Health Centre (FHC). These individuals were made to read a form (Appendix 1 Consent Form) which explains the study to be conducted, and informs the individual that the data will be confidential and after getting his/her oral or written consent the survey form was applied in electronic form and the required physical examinations and laboratory measurements were conducted. The measurements and sample collection for the laboratory examinations were performed by the midwives and the nurses at the FHCs.

Family physicians conducted the survey in electronic form, and performed the required physical examinations and laboratory measurements by inviting the two individuals selected from among their population to the FHC. The data were collected after getting the informed consent of the individual. This method is important for not only obtaining information about the present conditions but also for building up a database and provide support for the FPs' studies on monitoring chronic diseases and their risk factors.

The senior official for the research in the provinces were the Deputy Provincial Health Directors and they were responsible for the field study of the research together with the Community Health Care Department. They also worked in coordination with the supervisors in Provincial Department of Training and Provincial Department of Non-communicable Diseases and Chronic Conditions (Appendix 2).

The purpose and method to be followed in the provincial level are described to participants who were responsible for chronic diseases in each province in a one-day meeting held in Ankara on 11 May 2011.

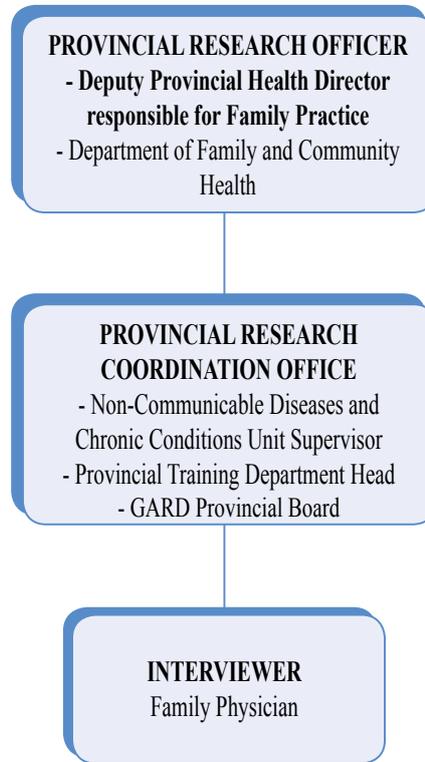


Figure 2.1 The organization scheme of the survey at the province level

2.3.1 Data Collection Tools

As the first stage of the study, the measurement, the Survey form for assessment of the prevalence and risk factors of chronic diseases in Turkey were devised in order to develop measurements, survey forms and methods to be used in the Chronic Diseases and Risk Factors Research in the provinces with the Family Practice application between January and March 2009. This study also aimed at detecting the deficiencies, and developing suggestions to them, by investigating whether the FPIS could provide the required indicators which are important in the surveillance of chronic diseases and their respective risk factors.

The survey form was revised considering the planning of the research, its priorities and the practical issues in its application. Later, the opinions of the Scientific Committee, established for this study, were received. In accordance with these suggestions the survey form was finalised and the survey form guideline was prepared. (Appendix 3 Questionnaire Form)

A status determination form comprising of 11 sections will be used as a data collection tool in the study. Questions related to the topics below were included in the survey form:

1. Household Information
2. Descriptive Information



3. Risk Factors
4. Family History
5. Personal Medical History
6. Chronic Health Issues
7. Life Quality
8. K1SA Health Survey
9. Physical Examination/Findings
10. Measurements and Examinations (Height, body weight, waist circumference, hip circumference, pulse, blood pressure, blood glucose, blood lipids, complete urinalysis, spirometry)
11. Management of Chronic Diseases at Primary Level

Notwithstanding that the data will be directly entered to the software, the form is prepared suitable for printing out for patients who would not be able to come to the FHC.

Physical examination, laboratory analyses and spirometry measurements will be used as data collection tools in the study in addition to the survey form. All definitions and references pertaining to the variables used in this study, and the measurement and analysis procedures are presented in detail in the findings section.

2.3.2 Data Entry Software

A software program that is compatible with the FPIS was written by the Information Technologies Coordination Office. The software is designed as to include the proceeding and guiding commands which eases the use of the survey form. Including the related sections of the survey form guideline into the database enabled the input to be correct and complete. The individuals selected for the sample were reported to the FPs via internet.

2.3.3 Pilot Survey

The survey form was revised with regard to the suggestions by the members of the Scientific Committee and was used in a preliminary test on healthy subjects by the FPs. It was seen that the survey form was generally understandable, and was applied without any problems; some corrections were made in the items for coding and options.

The pilot survey was completed on 26.05.2011 in a region registered to 38 FPs in Manisa province. The group established in Manisa Provincial Directorate of Health, headed by the Director of Health, executed the study by performing the sample selection and making the necessary official correspondence.

It was decided that 38 (10%) of the 378 FPs in the province participated in the pilot survey. Family Health Units (FHU) were categorized as urban and rural; and the FHU numbers were determined as urban (25 FHUs) and rural (13 FHUs) from the 13 districts other than 3 districts with integrated hospitals. In selection of FPs, the FHUs were determined with the systematic random sample method using the urban and rural FP list. Next, age group and sex features of an individual selected from the population over 15



years of age were listed for 38 FHUs (It was aimed that at least one individual from age groups divided in terms of 10 years was selected for the sample). Using the FPIS, random selection was made among the individuals who met the age and sex criteria and the Identification no, name-surname and address information of these were determined.

The Pulmonary Function Test devices at the district public hospitals were confirmed for the PFT which is among the examinations in the survey form. The list of the interviewees to be examined for PFT was officially delivered to the hospitals which had PFT devices.

The information for the family physicians, for the interviewees and the hospitals for PFT examinations were associated in one single list. Family physicians and Primary Health Care Centres were informed about the research over FPIS.

The preliminary test was required to be completed in 24-25 May 2011, and the survey form was required to be submitted to the Manisa Provincial Directorate of Health until 26.05.2011. Table 1 presents the FHC and FHU numbers according to urban and rural residence, and the number of FHUs participating in the Pilot Survey.

Table 2.1 Number of the FHC and FHU's according to urban and rural settlement in Manisa province.

DISTRICTS	Number of FHC		Number of FHU		Number of FHU in the sample		
	Urban	Rural	Urban	Rural	Urban	Rural	Total
Center	16	9	80	12	5	4	9
Ahmetli	1	1	4	1			0
Akhisar	9	12	34	14	3	2	5
Alaşehir	4	8	15	13	2	1	3
Demirci	2	7	6	8	1	0	1
Gölmarmara	1	0	5	0			0
Gördes	1	4	5	5	1	0	1
Kırkağaç	2	3	6	5	1	0	1
Köprübaşı	1	0	3	0			0
Kula	3	3	10	4	1	0	1
Salihli	9	9	30	15	3	2	5
Sarıgöl	2	5	6	5	1	0	1
Saruhanlı	2	9	5	12	1	2	3
Selendi	1	3	4	3	1	0	1
Soma	6	3	24	5	2	1	3
Turgutlu	12	6	32	7	3	1	4
Total	72	82	269	109	25	13	38



2.3.4 Pilot Survey Results

The pilot survey had been conducted in Manisa between 23 and 27 May 2011. The delivery of the survey form from the Provincial Directorates of Health to the FHC, their application, the returning of the forms to the Directorates of Health had been completed within this time-frame. The completion ratio for the surveys in such a short time was 76.3%. Completing the survey and performing the physical examinations took approximately 30-45 minutes.

There was not any important issue in asking the questions and marking the answers in general. Since the household population age and sex data should be complete in order to calculate the crude morbidity rate, it was determined that these data areas should be obligatory to be entered as electronic input. Although the questions pertaining to daily activities were mostly answered, 60% of the participants did not answer the question “Have the physical activities you do in your leisure time changed in the last 6 months?” A more detailed explanation was given in survey instructions. The reply rate for questions pertaining to by-pass operation, balloon angioplasty, heart crisis, sudden death, and stroke-paralysis seems high. However, despite the question “Does anybody in your family have diabetes?” was replied with a high rate, the question about the number of family members with diabetes was answered only by 10 participants. The options of this question were later changed and options about which members of the family had diabetes and other diseases were inserted into the question.

The response rate for diagnosed diseases was quite high. However, interestingly, the question which required the participant to declare the date of diagnosis, for all diseases, was not answered or answered at a low rate. It was thought the correct this situation by implementing appropriate linking in the electronic medium. KISA health survey questions were answered at a high rate, and family physicians made diagnoses over these questions at a rate over 80%. Anthropometric measurements were conducted at a rate over 80%, biochemical analyses were completed at a rate over 60%. Spirometry is the measurement with the lowest rate. Spirometry could be conducted on 14 participants (46.7%) in Manisa conditions.

It is seen that body height, systolic and diastolic blood pressure measurements, among other measurements and laboratory analyses, were conducted at 93%, and blood glucose, cholesterol and triglyceride measurements at 63%. However, the rate for recording the references of these measurements was even lower. Since this is an important criterion for evaluating the results, it is thought that the situation could be corrected by preventing the advance to the next question in the electronic medium.

Also, some problems were seen in recording the results of spirometry and laboratory measurements. These could be corrected by some annexation to the instructions and the e-survey. The main reason for the sketchiness in conducting the examinations is the limited duration. The results could not be recorded into the survey although blood samples had been taken.

As a result, it was seen that the pilot survey had been conducted successfully on the field. The correctness of the addresses registered in the provincial database and the serious and disciplined work of the coordination group at the Provincial directorate of health played an important role. As for family physicians, they fulfilled the duty responsibly. It could be understood from this rapid results that the FPs had full control on their population.



After the pilot survey, it was thought that if the provincial research coordination office gave the necessary support to the FPs, and in return if the FPs showed necessary effort to reach the interviewees in the sample and filled out the survey database in full and correctly, the research would be completed successfully.

2.3.5 Data Collection Stage

In June 2011, the database was set up and some test inputs were done by the staff and supervisors at the Non-communicable diseases and Chronic Situations Department. The issues encountered were reported to the Information Technologies Coordination Office, and the required revisions were made. The data collection by the FPs started on 4 July 2011. Due to reasons such as vacations on summer, the reappointment of FPs, and inability to reach the interviewee, the data collection period was extended until the end of September. In the instructions aimed at the province level application of the study, the FPs were requested to visit the participants who were not in a condition to visit the FHCs, and complete the study.

The interviewees were asked to the FHCs, they were taken into physical examination after filling out the survey form, and then their blood samples were taken. The blood samples were sent by the FP to the laboratory working with the FHC. The results were also taken by the FP and registered into the database. In addition, the spirometry appointments were organized by getting in touch with the closest hospital or with the coordination group at the provincial directorate; the interviewees were sent to these hospitals. The results for the PFT were entered into the database by FP.

The transformation of the raw data into a data structure, suitable for analysis, was completed by the Information technologies coordination office until 10 October 2011. The first analyses on the data were conducted and the results were presented at a meeting, in which the Ministry officials, WHO and World Bank representatives participated, on 26 October 2011.

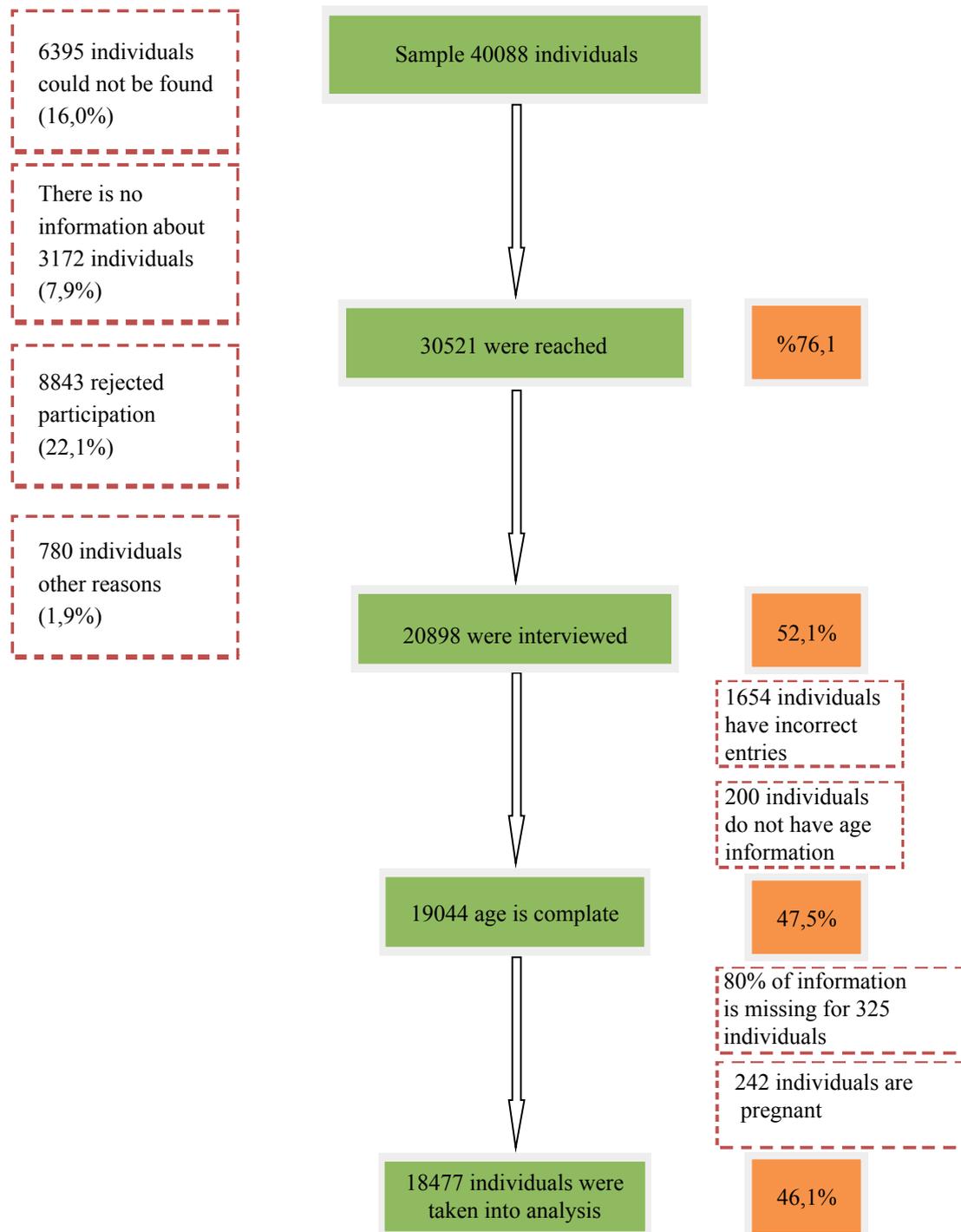


Figure 2.2 Study sample and response rates at different levels.

2.4 Survey Response Rates

Response rates and the reasons for non-response are presented in Figure 2.2. When the distribution of completed interviews to the NUTS regions, Western Marmara, Aegean, Eastern Marmara, Mediterranean, Central Anatolia and Western Black Sea regions are over the ratios they represent; and İstanbul, Western Anatolia, Middle Eastern Anatolia and South-eastern Anatolia are below the ratios they represent (Table 2.2).



Table 2.2 The proportion of interviews taken into analysis in the population over 15 years of age according to NUTS1 regions, Turkey 2011.

	Population over 15 years of age	%	Completed Interviews	%
İstanbul	10.090.565	18,40	2635	14,26
Western Marmara	2.568.252	4,68	970	5,25
Aegean	7.680.977	14,01	3107	16,82
Eastern Marmara	5.294.497	9,65	1964	10,63
Western Anatolia	5.354.490	9,76	1376	7,45
Mediterranean	6.928.770	12,63	2641	14,29
Central Anatolia	2.853.869	5,20	1172	6,34
Western Black Sea	3.528.523	6,43	1435	7,77
Eastern Black Sea	1.957.329	3,57	712	3,85
North Eastern Anatolia	1.490.995	2,72	525	2,84
Middle Eastern Anatolia	2.405.930	4,39	577	3,12
South Eastern Anatolia	4.690.209	8,55	1363	7,38
Total	54.844.406	100,00	18477	100,00

When the completion rates by provinces were considered, it is seen that the average is 45.7%, but there is a great variation between provinces (2%-81%). 11 of 12 provinces with the lowest completion rate is in South-eastern Anatolia region. The most successful results are in the Western provinces and provinces in the West with a population below one million with FP numbers between 50 and 250. The completion rate is over 60% in 27 provinces. The result “person not found” was stated as 37% highest and 6% lowest (average 16%). “Denied” was recorded as 42% highest and 4% lowest with an average of 24%. “No data entered” is 68% highest and 0% lowest with an average of 11%. According to these results, while the FPs interest, his control on his population, and workload play a role in the differences in the application of the survey between provinces, the management skills of the province coordination unit is an important determinant in increasing success.



Table 2.3 The proportion of interviews taken into analysis in the population over 15 years of age according to the provinces, Turkey 2011.

	Population (over 15)	%	Completed Interviews	%	Correction Factor
Adana	1.518.934	2,77	571	3,09	0,90
Adıyaman	402.470	0,73	140	0,76	0,97
Afyonkarahisar	524.636	0,96	233	1,26	0,76
Ağrı	320.886	0,59	96	0,52	1,13
Amasya	265.162	0,48	134	0,73	0,67
Ankara	3.707.558	6,76	712	3,85	1,75
Antalya	1.508.335	2,75	522	2,83	0,97
Artvin	132.092	0,24	56	0,30	0,79
Aydın	783.718	1,43	365	1,98	0,72
Balıkesir	936.917	1,71	389	2,11	0,81
Bilecik	184.930	0,34	66	0,36	0,94
Bingöl	175.877	0,32	28	0,15	2,12
Bitlis	200.231	0,37	83	0,45	0,81
Bolu	217.396	0,40	102	0,55	0,72
Burdur	208.888	0,38	111	0,60	0,63
Bursa	2.013.116	3,67	686	3,71	0,99
Çanakkale	408.662	0,75	170	0,92	0,81
Çankırı	141.919	0,26	52	0,28	0,92
Çorum	413.106	0,75	193	1,04	0,72
Denizli	723.690	1,32	363	1,96	0,67
Diyarbakır	963.572	1,76	253	1,37	1,28
Edirne	323.943	0,59	113	0,61	0,97
Elazığ	411.124	0,75	187	1,01	0,74
Erzincan	175.781	0,32	66	0,36	0,90
Erzurum	534.732	0,97	199	1,08	0,91
Eskişehir	620.229	1,13	241	1,30	0,87
Gaziantep	1.104.490	2,01	371	2,01	1,00
Giresun	332.477	0,61	156	0,84	0,72
Gümüşhane	99.356	0,18	45	0,24	0,74
Hakkari	152.827	0,28	19	0,10	2,71
Hatay	1.045.392	1,91	432	2,34	0,82
Isparta	362.611	0,66	124	0,67	0,99
Mersin	1.228.061	2,24	512	2,77	0,81
İstanbul	10.090.565	18,40	2635	14,26	1,29
İzmir	3.167.802	5,78	1042	5,64	1,02
Kars	205.624	0,37	75	0,41	0,92
Kastamonu	292.013	0,53	100	0,54	0,98
Kayseri	902.355	1,65	397	2,15	0,77
Kırklareli	274.474	0,50	103	0,56	0,90
Kırşehir	172.217	0,31	87	0,47	0,67
Kocaeli	1.176.256	2,14	380	2,06	1,04



	Population (over 15)	%	Completed Interviews	%	Correction Factor
Konya	1.473.616	2,69	575	3,11	0,86
Kütahya	477.474	0,87	234	1,27	0,69
Malatya	546.168	1,00	94	0,51	1,96
Manisa	1.088.580	1,98	417	2,26	0,88
Kahramanmaraş	718.421	1,31	274	1,48	0,88
Mardin	456.502	0,83	114	0,62	1,35
Muğla	649.155	1,18	334	1,81	0,65
Muş	242.024	0,44	96	0,52	0,85
Nevşehir	212.368	0,39	89	0,48	0,80
Niğde	243.503	0,44	118	0,64	0,70
Ordu	551.709	1,01	158	0,86	1,18
Rize	248.776	0,45	95	0,51	0,88
Sakarya	663.975	1,21	293	1,59	0,76
Samsun	956.978	1,74	394	2,13	0,82
Siirt	175.894	0,32	33	0,18	1,80
Sinop	162.204	0,30	42	0,23	1,30
Sivas	485.191	0,88	124	0,67	1,32
Tekirdağ	624.256	1,14	195	1,06	1,08
Tokat	470.763	0,86	211	1,14	0,75
Trabzon	592.919	1,08	202	1,09	0,99
Tunceli	63.349	0,12	3	0,02	7,11
Şanlıurfa	962.180	1,75	210	1,14	1,54
Uşak	265.922	0,48	119	0,64	0,75
Van	614.330	1,12	67	0,36	3,09
Yozgat	353.058	0,64	175	0,95	0,68
Zonguldak	491.095	0,90	147	0,80	1,13
Aksaray	271.033	0,49	102	0,55	0,90
Bayburt	55.239	0,10	19	0,10	0,98
Karaman	173.316	0,32	89	0,48	0,66
Kırıkkale	214.144	0,39	80	0,43	0,90
Batman	303.978	0,55	91	0,49	1,13
Şırnak	237.112	0,43	98	0,53	0,82
Bartın	150.514	0,27	79	0,43	0,64
Ardahan	77.583	0,14	22	0,12	1,19
Iğdır	121.150	0,22	48	0,26	0,85
Yalova	161.217	0,29	81	0,44	0,67
Karabük	184.769	0,34	83	0,45	0,75
Kilis	84.011	0,15	53	0,29	0,53
Osmaniye	338.128	0,62	95	0,51	1,20
Düzce	257.378	0,47	115	0,62	0,75
Total	54.844.406	100,00	18477	100,00	1,00



2.5 Database Clean-Up

A database clean up procedure was conducted after receiving the database. In order to detect the extreme values for database clean up, first the minimum, maximum and descriptive statistics were investigated for each variable. In order to detect incorrect coding the frequencies of variables with subcategories were taken. Additionally, some cross check were performed for various variables. It was seen that entries with negative values were entered into the database for many variables, suggestive of incorrect entry. These data were omitted from the database (1654 individuals). Since the age variable is one of the major variables for the analysis, 200 individuals without age information were omitted also. For some of the entries for which the dates of birth were entered as the dates of the interviews, the real information was obtained from the Information Technologies Coordination Office. When the frequencies were taken and the cross check was performed in this data set, it was seen that more than 80% of the information for 325 individuals were missing, and these data were omitted also. Lastly, the database was made ready by removing the data for 242 pregnant individuals.

2.6 Data Analysis

The prevalence of the variables investigated in the study are presented in separate tables for males and females with regard to age, place of residence (urban/rural), regions and NUTS1 regions. When the data were presented according to age groups, NUTS regions and area of residence, row percentages and number in each category were given. The total numbers are varied due to missing answers or data entry errors which were omitted during analysis. In the crosstables where more than one variable were used the total numbers at the end of the tables are according to gender.

The data for the 18477 individuals included in the research are presented in tables according to the NUTS regions and provinces. The weights were calculated using the distribution rates of provinces to the total population and the distribution rates of individuals to the provinces. Therefore, different reply rates between provinces were corrected according to distribution over Turkey. Correction Factor is the opposite of the value below:

$R = \text{Completed interview} / \text{The number of individuals to be interviewed}$

When the correction factor is used the figures are rounded which may result in ± 1 difference in the row totals. For the results to be comparable with other results in national and international literature age grouping were done as 10 year segments, starting from 15-24 age group up to 75 years. In the research, regions with a population below 20,000 were accepted as rural areas; and regions over 20,000 were accepted as urban areas. NUTS1 (Nomenclature of Units for Territorial Statistics) started to be applied as of the Cabinet Decree no 2002/4720 dated 28.08.2002. According to this, Turkey was divided into 12 regions (Table 2.4).



Table 2.4 Nomenclature of units for territorial statistics, 2005

KODLAR	NUTS-I (12 BÖLGE)
TR1	İstanbul
TR2	Western Marmara
TR3	Aegean
TR4	Eastern Marmara
TR5	Western Anatolia
TR6	Mediterranean
TR7	Central Anatolia
TR8	Western Black Sea
TR9	Eastern Black Sea
TRA	North Eastern Anatolia
TRB	Middle Eastern Anatolia
TRC	South Eastern Anatolia

The continuous variables such as age, lipid levels, serum creatinine levels were presented with their averages and standard deviations. The 95% confidence interval for prevalence was calculated with the Wald normal approximation formula. The formula below was used to calculate the confidence intervals:

$$p \pm 1.96 \times \text{Standard error (p)}$$

$$\text{Standard error (p)} = \sqrt{(p^2(1-p)/n)}$$

For the total prevalence to be calculated for males and females, a standardization was conducted with regard to the age and sex distribution of Turkey in 2011. The data collected for the research was analysed using SPSS 15.0 software package.

2.7 Limitations and Strengths of the Study

The Prevalence of Chronic Diseases and Risk Factors in Turkey Survey has a method which is used for the first time in our country. It was planned to be conducted in the given conditions of the Family Practice System. In addition to determine the prevalence of chronic diseases and their risk factors, it was aimed at taking a step towards determining the framework for surveillance functions in this field and the integration of this function to daily practices. On this account, it was decided to include all family physicians instead of working with a sample.

As it was foreseen there are some strengths and limitations going along with this method. Due to being the first application over FHIS, some issues such as computer software mismatches, inadequacy of some FPs in computer use, lack of internet infrastructure in some provinces, workload of Information Technologies Department and late reply to the issues were confronted. These issues delayed the completion of the study and decreased the participation rate. Apart from this, data collection periods coinciding with summer vacation and Ramadan period influenced participation negatively. Spirometry application within the



study caused some executive issues in provinces, and the solutions for these issues were expected from the central organisation, and this delayed or hindered the interviews with some participants.

In some provinces, some issues such as the novelty of the transition to family practice, provincial directorate's lack of control over the field, frequent replacement of FPs emerged as important obstacles before the study. Depending on all these factors the participation rate was lower than expected (47.5%). Denial rate in the population selected for the study is 22%. However, the participation rates in the studies in developed countries have been gradually decreasing. The median participation rate for a similar study, BRFSS, in the USA, was 71% in 1993, 49% in 2000, and 51% in 2005 (9). Collection of the data by a number FPs over 20000 could be seen as a problem in terms of standardization. However, there is an advantage of being a physician in evaluating the diseases and their symptoms. Some technical difficulties were also experienced during data input. In order to prevent this, computer software should be revised and training should be provided for the staff.

The method used in the study also provided some advantages. The method allowed a fast and economic data collection for the survey. Conducting a study nation-wide without needing any logistics, transportation and accommodation provided convenience both in preparation period and application period and reduced the costs to minimum. It is necessary to make use of FHIS, a surveillance system which covers all the country, and to evaluate the performance of the system; this study came useful in this respect, also. It would be easier to conduct similar studies or a follow-up study with the experiences gained from this study and by making necessary corrections and recovering the failures.

2.8 Recommendations and Comments

In regard of the age structure of the population, health care needs and burden of disease, chronic diseases are of crucial priority. Although the Ministry of Health has started various programs for preventing and control of chronic diseases, there is no routine surveillance in this area. This study is a first step for the chronic disease surveillance in Turkey setting the framework and content. If whole population will be targeted for surveillance the content can be downsized or more detailed data can be collected if there will be sampling. In any case the data base within the FPIS should be revised to minimize data entry errors in light of the experience gained in this study. In addition, FP needs to have good communication and acceptance in the community in order to raise the response levels. Monitoring and evaluation of the FPs should be done at the local level rather than the central administration. During these processes, the chronic disease units at the province will conduct continuing education thus raise the knowledge and awareness of the FP. As a result the problems in the implementation of the survey will be solved more easily and the data quality and coverage will increase.



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3

Descriptive Characteristics of Survey Respondents





3 Descriptive Characteristics of Survey Respondents

Professor Sibel KALAÇA

Key Findings

- This chapter presents the data on the age and sex of the household population; and the defining characteristics of the individuals above 15 years of age who participated in the study with complete data about sex and age.
- Household population is 63.202, with a 55% of female proportion. The average household size is 3.42.
- 17% of the household population is younger than 15 years of age; 76% is in working age (15-64 age group) and 7% is in 65-and-above age group.
- There are 18.477 individuals who participated in the interviews with complete age and sex information. 47% of the respondents are males.
- 69% of the participants are married and 71% of them live in an urban area.
- 18% of the participants live in İstanbul, followed by the most developed regions of the country with a 14% in the Aegean region, 13% in the Mediterranean region, 10% in Eastern Marmara region.
- In total 11% of the participants are illiterate. More than half of the participants (55%) have primary education levels.
- Both males and females living in urban areas are more educated than the ones living in rural areas.
- The education inequality between sexes is obvious in terms of place of residence as it is in age groups. The percentage of uneducated females is three times higher than uneducated males in rural areas.
- South-eastern Anatolia Region has the highest rate for uneducated males and females. Females are disadvantageous in terms of education.
- The unemployment rate is 9%.
- Eleven percent of males are not covered by any health insurance; this is 6% for females.
- “Yeşil kart” ownership in rural areas is approximately three times higher than the ones living in urban areas.
- The median age for first marriage for females is 19; the median is 17 in uneducated females.



3.1 Introduction

This section presents the age and sex distribution of the household population selected for the Ministry of Health Chronic Diseases Prevalence and Risk Factors Determination Survey, and the characteristics of the study respondents who were above 15 years of age. The data presented in this section will be relevant for the evaluation of the chronic diseases and risk factors discussed in the following sections. Also, data related to the household population could be used as a means in calculating the mortality rates and evaluating the representativeness of the sample.

3.2 Methods and Definitions

While interviewing the individuals selected for the sample, first all individuals living in the same household were listed; all data pertaining to household was obtained from here.

In the second section of the data collection form the defining characteristics of the respondents were evaluated. In this section information about age, sex, education status, marital status, age of first marriage for the ones with marriage history, employment in a wage-earning job in the last month, and existence of health insurance coverage were questioned. The employment definitions questioning the employment in a wage-earning job were adopted from Boratav's classification (1). Unemployment definition covers male participants who declared that they have been unemployed for the last month that are looking for a job, and female participants who are housewives and looking for a job (2). For female, the age for first marriage and menopause status were evaluated.

3.3 Findings

This section of the report presents the size of the household population, distribution by age, sex and descriptive characteristics of the interviewees, namely the study group.

3.3.1 Household Population

Table 3.1 and Figure 3.1. present the distribution of household population to age groups (in fives) and sex. Household population is 63.202 with a rate of 55% for females and 45% for males. Average household size is 3.42. Starting from 30-34 age group, proportion of females is higher than males in each age group.



Table 3.1 Household population by age and sex, Turkey 2011.

Age	Male		Female		Total	
	n	%	n	%	n	%
<5	1386	2,2	1410	2,2	2796	4,4
5-9	1671	2,6	1689	2,7	3360	5,3
10-14	2245	3,5	2083	3,3	4328	6,8
15-19	3645	5,7	3384	5,4	7029	11,1
20-24	3308	5,2	3304	5,2	6612	10,5
25-29	2830	4,5	2958	4,7	5788	9,2
30-34	2235	3,5	2888	4,6	5123	8,1
35-39	1841	2,9	3004	4,7	4845	7,7
40-44	1740	2,7	2911	4,6	4651	7,4
45-49	1831	2,9	3094	4,9	4925	7,8
50-54	1519	2,4	2288	3,6	3807	6,0
55-59	1336	2,1	1900	3,0	3236	5,1
60-64	883	1,4	1349	2,1	2232	3,5
65-69	663	1,0	905	1,4	1568	2,5
70-74	442	0,7	709	1,1	1151	1,8
75-79	376	0,6	528	0,8	904	1,4
80+	304	0,5	507	0,8	811	1,3
Unknown-Not answered	19	0,03	17	0,03	36	0,05
Total	28274	44,7	34928	55,3	63202	100,0

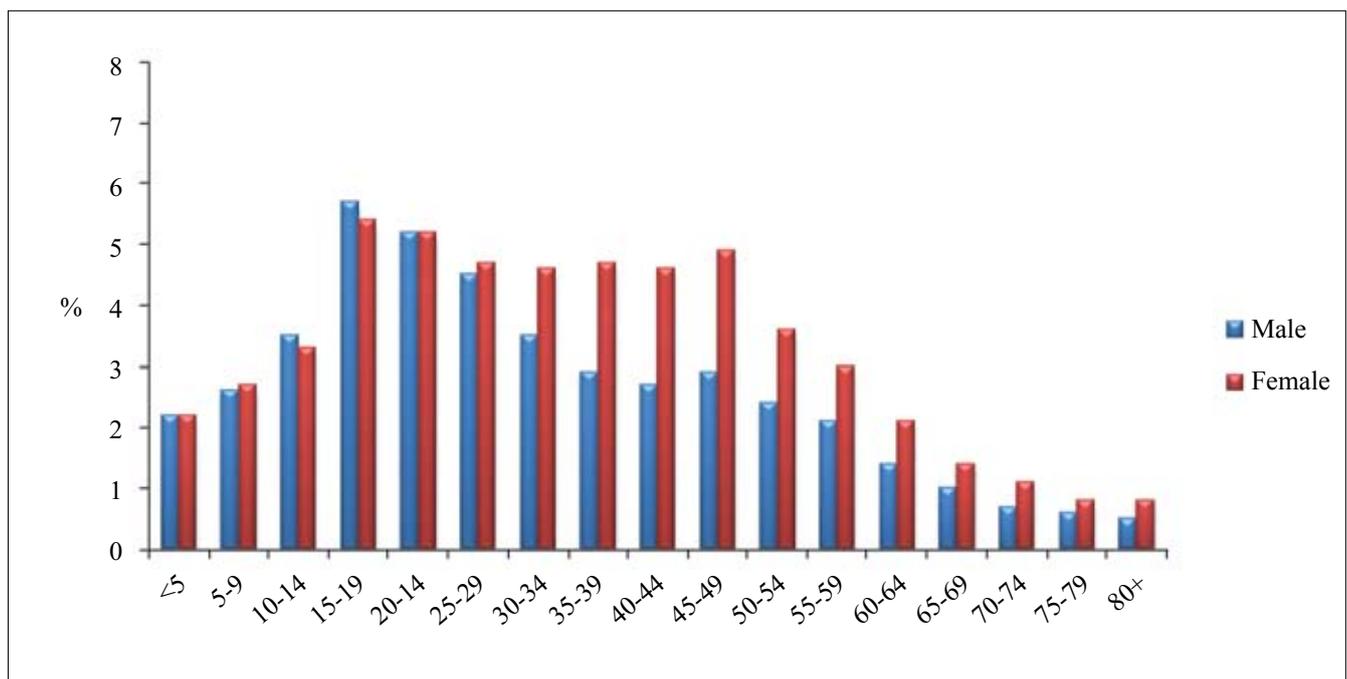


Figure 3.1 Household population by age groups and sex, Turkey 2011.



Table 3.2 and Figure 3.2. compares the distribution of household population to age groups with Turkish Statistical Institute (TURKSTAT) 2010 population data (3). 17% of the population is below 15 years of age. Proportion of the working age population (15-64 age group) is 76%; and the rate of 65-and-above population is 7%.

Table 3.2 Comparison of survey household population by age groups with TURKSTAT 2010 data, Turkey 2011.

Age Groups	Survey Household Population, %			TURKSTAT 2010, %
	Male	Female	Total	Total
0-14	8,4	8,2	16,6	25,6
15-64	33,5	42,9	76,4	67,2
65+	2,8	4,2	7,0	7,2
Total	100,0	100,0	100,0	100,0

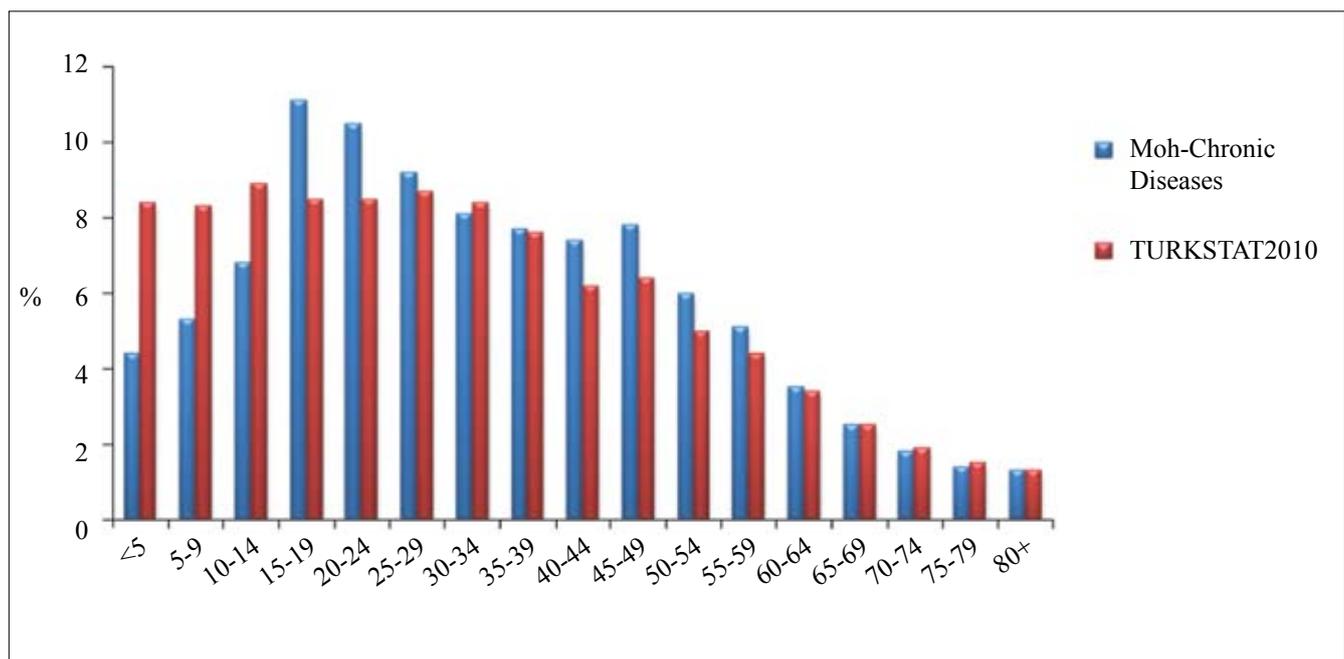


Figure 3.2 Comparison of survey household population by age groups with TURKSTAT 2010 data, Turkey 2011.



3.3.2 Characteristics of Survey Respondents

This section presents the characteristics of survey respondents who are above 15 years of age.

Age, Sex and Marital Status

There are 18.477 individuals who participated in the survey with complete age and sex information. 47% the respondents are males; average age in males is 40.9 ± 17.0 and 41.3 ± 17.2 in females. Young population (15-24 age group) comprises 19% of the group; the rate for the ones in 25-64 age group is 70%, and the rate for the population over 65 years of age is 11%. The distribution of males and females in age groups is similar (Figure 3.3).

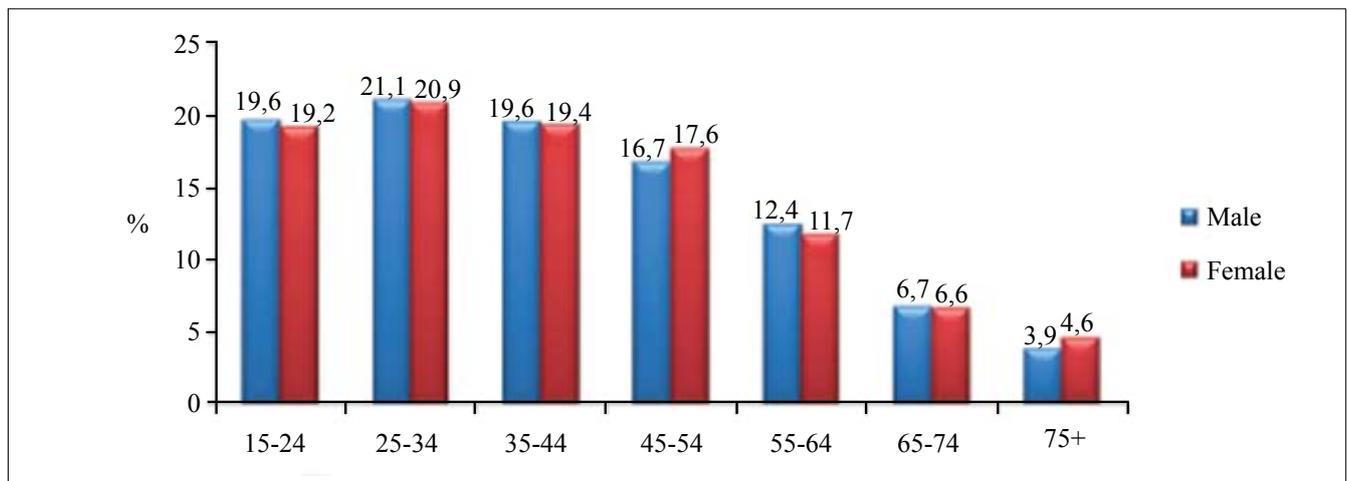


Figure 3.3 Survey respondents by age groups and sex, Turkey 2011.

In total 69% of the participants are married, and 22% of them have never been married. When evaluated in terms of area of residence, 71% of the participants live in urban areas. When evaluated in terms of NUTS1 regions, 18% of the participants live in İstanbul; followed by the most developed regions of the country with a 14% rate in the Aegean region, 13% in the Mediterranean region and 10% in Eastern Marmara region (Table 3.3).



Table 3.3 Descriptive characteristics of the study group, Turkey 2011.

	Weighted percentage	Weighted number	Unweighted number
Sex (n=18477)			
Male	47,4	8761	8748
Female	52,6	9715	9729
Age groups(n=18477)			
15-24	19,4	3585	3563
25-34	21,0	3877	3791
35-44	19,5	3596	3562
45-54	17,2	3180	3191
55-64	12,0	2224	2277
65-74	6,7	1234	1279
75+	4,2	781	814
Marital Status(n=18458)			
Married	69,4	12816	12817
Divorced	2,0	367	366
Widowed	5,9	1089	1132
Married, separated	,7	124	124
Single, never married	22,0	4062	4023
Area of residence (n=18161)			
Rural	29,4	5335	5895
Urban	70,6	12825	12287
NUTS1 regions (n=18477)			
İstanbul	18,4	3399	2635
Western Marmara	4,7	866	970
Aegean	14,0	2581	3107
Eastern Marmara	9,6	1783	1964
Western Anatolia	9,7	1799	1376
Mediterranean	12,6	2337	2641
Central Anatolia	5,2	964	1172
Western Black Sea	6,4	1189	1435
Eastern Black Sea	3,6	660	712
North Eastern Anatolia	2,7	504	525
Middle Eastern Anatolia	4,4	816	577
South Eastern Anatolia	8,5	1579	1363
Education Status (n=18413)			
Illiterate	11,4	2096	2083
Literate	5,2	957	976
Primary school graduate	39,1	7197	7371
Secondary school graduate	16,4	3027	2999
High school graduate	18,7	3442	3351
University graduate	9,2	1693	1639

* For some variables category totals may differ from the total numbers due to weighting



Educational Status

11% of the participants are illiterate; the rate of uneducated participants, with the literate ones, is 17%. More than half of the participants (55%) have primary education levels (primary + secondary) (Table 3.3).

Table 3.4 and 3.5 presents the education status by age groups, area of residence and NUTS1 regions separately for males and females. As it is expected, both in males and females, younger population is more educated compared to the older group. Another important feature about education status is that males are more educated than males in all age groups. 49% of the males in the 75-and-above age group have not completed any education levels; this rate is 83% in females. While the rate for uneducated in 15-24 age group males is 2%, it is 7% in females. 43% of the males and 39% of females in the same age group are high school graduates.

Table 3.4 Educational status of the male survey participants, Turkey 2011.

Basic characteristics	Uneducated	Primary school stage 1	Primary school stage 2	High school and higher	Total	
Age	%	%	%	%	%	Number
15-24	1,9	7,6	47,4	43,1	100,0	1719
25-34	2,0	32,9	16,5	48,6	100,0	1847
35-44	3,2	48,3	14,3	34,2	100,0	1714
45-54	5,3	53,3	13,3	28,2	100,0	1467
55-64	10,3	59,4	9,7	20,6	100,0	1085
65-74	28,0	49,2	8,5	14,3	100,0	591
75+	49,3	39,8	3,9	7,1	100,0	337
Area of residence						
Rural	12,1	49,8	18,8	19,0	100,0	2604
Urban	5,3	34,4	19,8	40,3	100,0	6007
NUTS1 regions						
İstanbul	2,5	38,9	21,8	36,4	100,0	1593
Western Marmara	7,2	46,5	13,7	32,4	100,0	417
Aegean	6,9	45,6	17,6	29,8	100,0	1165
Eastern Marmara	5,2	35,8	19,6	39,4	100,0	854
Western Anatolia	4,0	34,7	21,0	40,0	100,0	805
Mediterranean	6,6	42,4	19,8	30,9	100,0	1131
Central Anatolia	6,7	38,8	21,2	33,0	100,0	451
Western Black Sea	10,3	40,9	17,8	30,8	100,0	562
Eastern BlackSea	8,2	36,0	18,3	37,5	100,0	319
North Eastern Anatolia	14,1	40,0	19,6	25,5	100,0	255
Middle Eastern Anatolia	11,2	27,2	20,6	40,0	100,0	440
South Eastern Anatolia	18,8	33,4	20,2	27,4	100,0	769
Total	7,4	38,9	19,6	33,8	100,0	8761

* Total is calculated based on educational status



Table 3.5 Educational status of the female survey participants, Turkey 2011.

Basic characteristics	Uneducated	Primary school stage 1	Primary school stage 2	High school and higher	Total	
Age	%	%	%	%	n	%
15-24	7,1	12,3	41,9	38,7	1866	100,0
25-34	11,4	46,3	10,5	31,9	2030	100,0
35-44	13,7	56,0	7,7	22,6	1882	100,0
45-54	25,3	53,0	6,9	14,7	1713	100,0
55-64	49,2	39,3	2,9	8,5	1138	100,0
65-74	67,0	26,2	3,0	3,9	643	100,0
75+	82,8	13,1	0,7	3,4	442	100,0
Area of residence						
Rural	38,0	40,6	11,1	10,1	2732	100,0
Urban	19,4	38,5	14,5	27,4	6818	100,0
NUTS1 regions						
İstanbul	17,2	39,2	13,9	29,4	1806	100,0
Western Marmara	18,3	50,3	11,6	19,6	449	100,0
Aegean	20,8	43,5	12,6	22,9	1416	100,0
Eastern Marmara	16,6	43,8	14,0	25,2	929	100,0
Western Anatolia	17,4	41,8	13,5	27,1	995	100,0
Mediterranean	23,9	38,5	14,4	22,8	1206	100,0
Central Anatolia	30,0	39,2	14,2	16,6	513	100,0
Western Black Sea	30,0	42,4	13,1	14,5	627	100,0
Eastern Black Sea	27,9	34,0	12,9	25,2	341	100,0
North Eastern Anatolia	43,5	34,3	8,9	12,9	249	100,0
Middle Eastern Anatolia	44,6	24,4	15,9	15,1	376	100,0
South Eastern Anatolia	48,5	24,9	13,6	13,0	810	100,0
Total	24,8	39,1	13,5	22,4	9715	100,0

* Total is calculated based on educational status

Individuals living in urban areas are more educated than the ones living in rural areas for both males and females. The education inequality between sexes is clear in evaluations in terms of areas of residence as well as in terms of age groups. While the rate for uneducated in rural area males is 12% and urban area males is 5%, it is 38% and 19% for females, respectively. The rate for uneducated females in rural areas is three times higher than males. This difference comes up to four times in urban areas.

Among the NUTS1 regions, South-eastern Anatolia Region has the highest uneducated rate in both males and females. However it is also seen here that females are disadvantageous in terms of education. The rate for uneducated females in South-eastern Anatolia (48%) is approximately three times more than males (19%). The regions with the lowest rates for uneducated are İstanbul (2%) and Western Anatolia (4%) for males, they are Istanbul and Eastern Marmara (17%) for females (Table 3.4, 3.5)(Figure 3.4, 3.5).

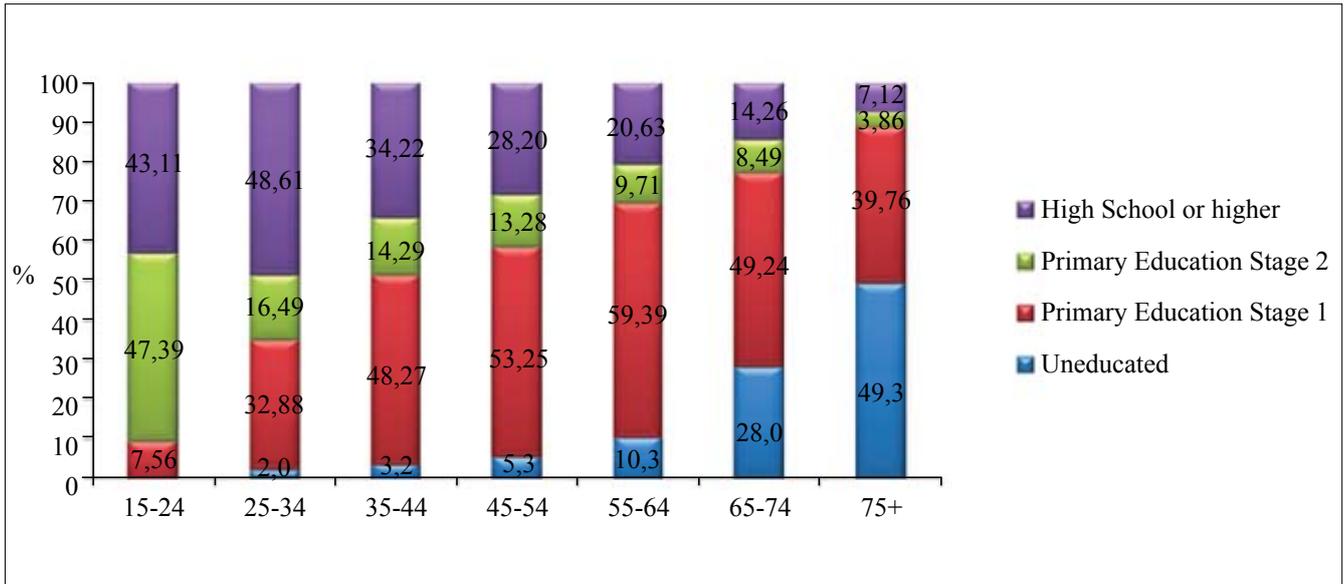


Figure 3.4 Educational status of the males according to age groups, Turkey 2011.

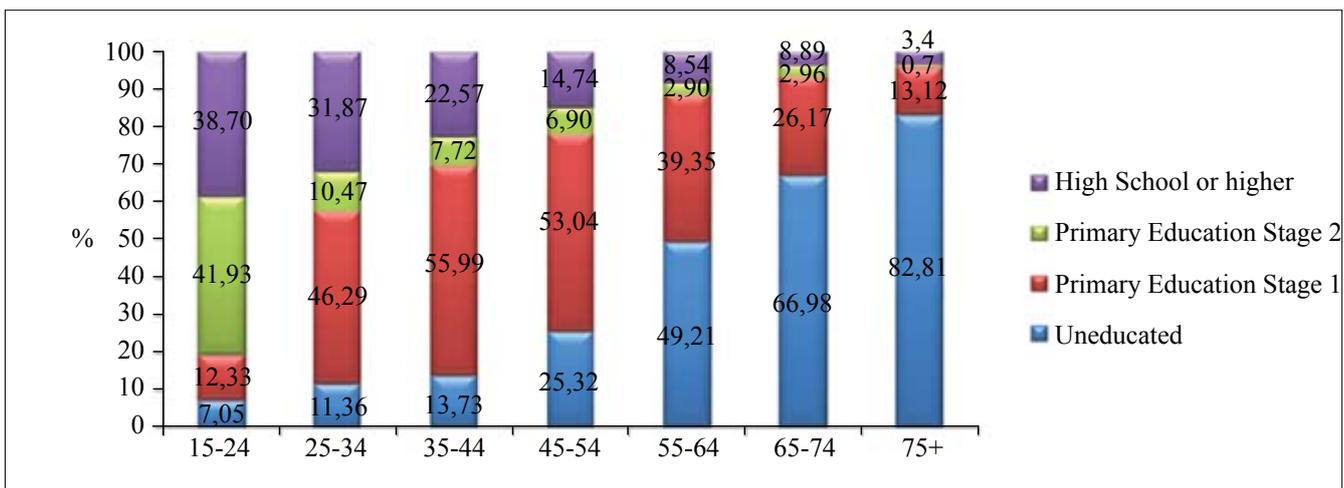


Figure 3.5 Educational status of the females according to age groups, Turkey 2011.

Employment, Labour and Health Insurance

Table 3.6. presents the employment in a wage-earning job in the last month by sex. When the rate of participants who have been unemployed since the last month and who are looking for jobs and the rate of housewives who are looking for jobs are combined, the total rate of unemployment is calculated as 10 %.

When evaluated in terms of NUTS1 regions, unemployment rates vary between 7 % (Istanbul) and 12% (Eastern Central Anatolia, North-Eastern Anatolia and the Mediterranean regions) (Figure 3.6).



Table 3.6 Employment in a wage-earning job in the last month by sex, Turkey 2011

	Male		Female	
	n	%	n	%
Employment in a wage-earning job				
Unemployed, looking for jobs	688	8,5	405	4,5
Unemployed, not looking for jobs	566	7,0	840	9,2
Housewife, looking for jobs	-	-	498	5,5
Housewife, not looking for jobs	-	-	5580	61,4
Industrial worker	1820	22,5	288	3,2
Salesclerk, etc.	502	6,2	180	2,0
Office worker	431	5,3	253	2,8
Doctor, engineer	434	5,4	263	2,9
Employer who employ 3 or more workers	222	2,7	55	,6
Employer who employs less than 3 workers	182	2,2	34	,4
Tradesman or craftsman	450	5,6	53	,6
Working jobs with irregular income	306	3,8	121	1,3
Agricultural labour (wage labourer)	125	1,5	58	,6
Agricultural labour (self employed)	666	8,2	108	1,2
Retired, not working	1441	17,8	322	3,5
Retired, working	256	3,2	27	,3
Total	8089	100,0	9086	100,0

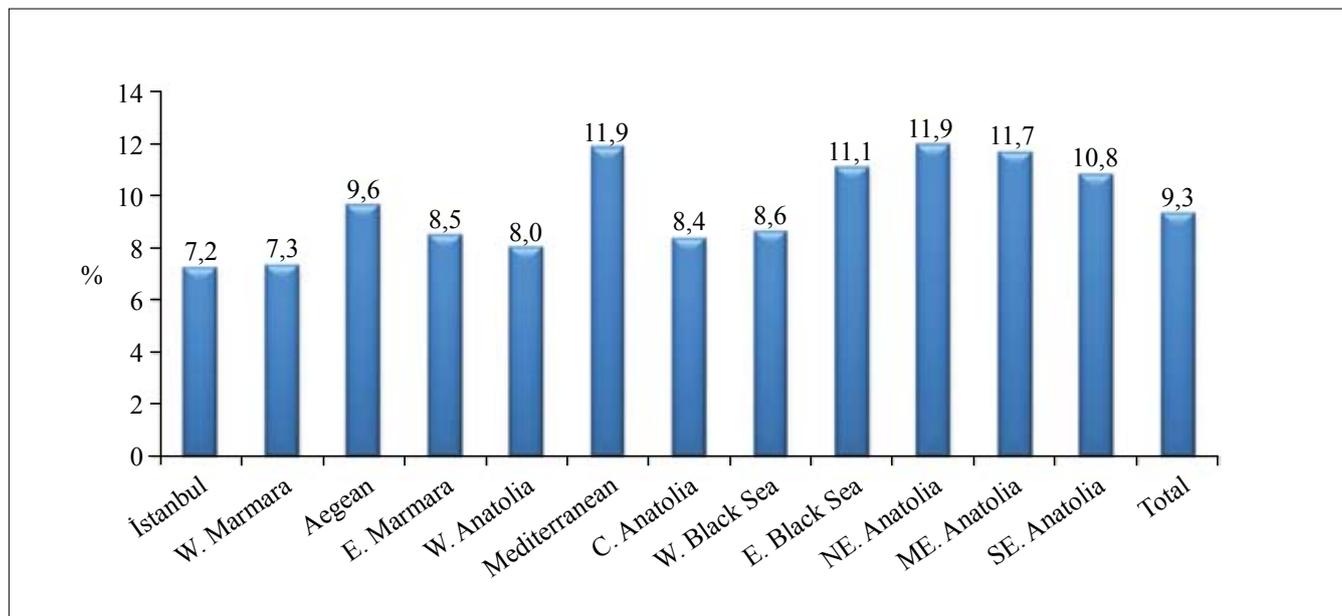


Figure 3.6 Unemployment rates by NUTS1 Regions, Turkey 2011.



Industrial workers comprise the majority of employed males (22%). The rate for agricultural workers (self-employed and paid agricultural worker) is 10%, and the rate for retired participants is 18 %. The rate for housewives is 67% and 5.5% of them stated that they were looking for jobs.

Table 3.7 presents the distribution of health insurance types in terms of some selected features. The rate for males who are not covered by any insurance is 11% and for females it is 7,6%. The rate for females with yeşil kart (is a national program which insures costs of treatment for people who are not covered by any social insurance system) (13%) is slightly higher than males (11%). The biggest group for both sexes is the Social Insurance Institution (SSK) covered one with a 50% rate (Figure 3.7). When evaluated in terms of age groups, 15-34 age group comprises the majority of the participants who are not covered by any health insurance (27%). "Yeşil kart" ownership is the highest in 15-24 age group (16%) and 75-and-above age group (17%). Yeşil kart ownership is the highest among uneducated group (29%); this percentage is 37% among uneducated men, whilst 27% among uneducated female (Table 3.7).



Table 3.7 Percentage distribution of type of health insurance by sex, age, NUTS1 regions and area of residence, Turkey 2011.

	Health Insurance (%)						Total	Number
	Not Covered	Yeşil kart	SSK	Bağkur	Emekli Sandığı	Private		
Sex								
Male	11,2	11,5	48,6	16,8	11,0	0,9	100,0	8706
Female	7,6	12,9	50,9	16,3	11,5	0,8	100,0	9662
Age								
15-24	16,3	15,8	47,4	11,7	8,3	0,6	100,0	3553
25-34	10,9	13,9	54,9	12,4	6,9	1,0	100,0	3851
35-44	9,5	11,6	49,4	17,2	11,4	0,9	100,0	3574
45-54	6,9	9,5	51,8	16,4	14,6	0,8	100,0	3165
55-64	3,6	7,6	50,1	22,2	15,5	1,0	100,0	2220
65-74	3,1	10,8	44,6	26,0	14,5	1,0	100,0	1230
75 +	4,9	16,6	37,2	25,8	14,9	0,5	100,0	776
NUTS1 regions								
İstanbul	10,8	3,1	66,1	11,1	7,0	1,9	100,0	3375
Western Marmara	8,7	5,7	48,8	24,9	11,3	0,5	100,0	858
Aegean	11,0	6,1	51,4	19,6	10,8	1,1	100,0	2571
Eastern Marmara	7,5	4,5	61,3	16,4	9,8	0,6	100,0	1780
Western Anatolia	7,2	5,0	51,9	17,9	17,3	0,7	100,0	1783
Mediterranean	8,9	16,3	42,8	19,7	11,6	0,6	100,0	2327
Central Anatolia	8,6	13,1	42,7	21,8	13,0	0,7	100,0	960
Western Black Sea	7,8	11,5	47,5	19,2	13,6	0,5	100,0	1186
Eastern Black Sea	5,2	12,9	48,9	17,2	15,5	0,3	100,0	657
North Eastern Anatolia	9,4	38,0	29,3	12,9	10,4	-	100,0	498
Middle Eastern Anatolia	8,0	36,0	30,0	10,6	15,2	0,1	100,0	809
South Eastern Anatolia	12,9	35,6	31,0	11,3	8,8	0,4	100,0	1563
Area of residence								
Rural	10,9	22,0	35,7	24,3	6,8	0,3	100,0	5305
Urban	8,7	8,1	55,8	13,3	13,1	1,0	100,0	12751
Educational status								
Uneducated	6,9	29,0	39,4	18,7	5,6	0,4	100,0	3038
Primary School Graduate	9,9	11,4	53,2	19,5	5,5	0,4	100,0	7167
Secondary school graduate	11,8	11,4	52,6	14,4	9,1	0,7	100,0	3004
High school and Higher	8,5	3,7	49,8	12,3	23,9	1,7	100,0	5103
Total	9,3	12,2	49,8	16,5	11,3	0,8	100,0	18368

* Total is calculated based on health insurance

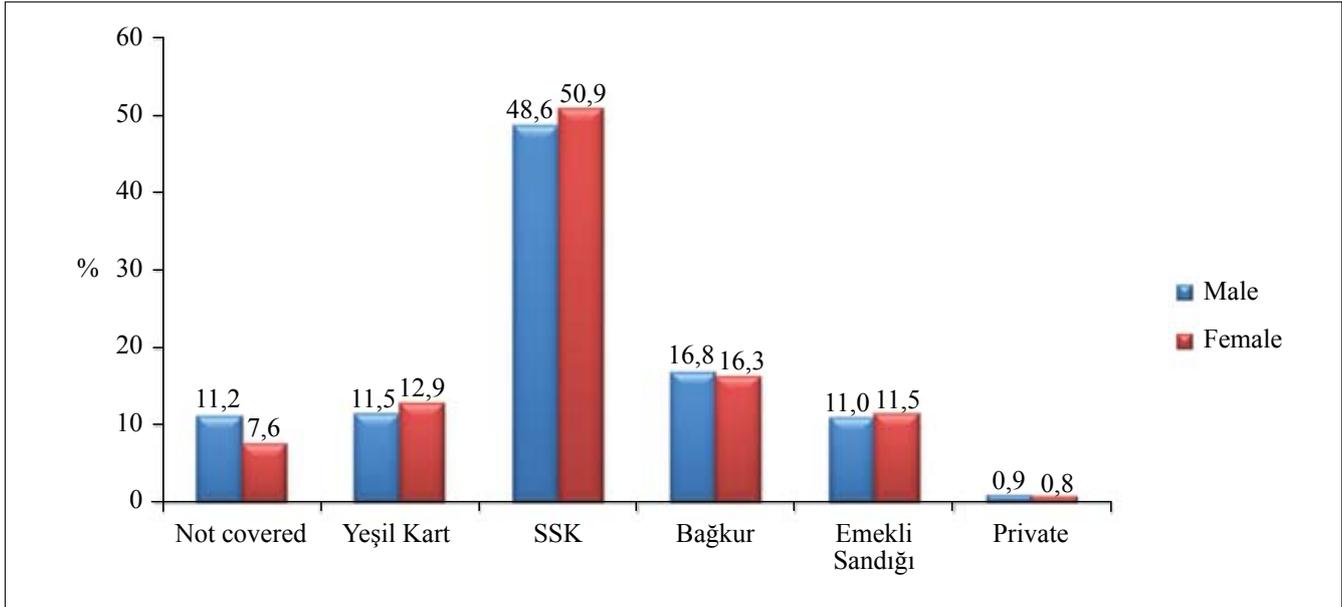


Figure 3.7 Type of health insurance by sex, Turkey 2011.

Bağkur: Social Insurance Institution for the Craftsmale and Artisans and Other Self Employers, Emekli Sandığı: Pension Fund, SSK: Social Insurance Institution Yeşil kart: Green Card program (free of charge healthcare service for those who are unable to afford it or those who have limited ability to afford healthcare with their low income).

When evaluated in terms of area of residence the rate of participants who are not covered by any health insurance in rural areas (11%) is higher than the ones in urban areas (9%). Yeşil kart ownership in rural areas is three times higher than urban areas.

When evaluated in terms of NUTS1 regions, the regions with the highest rate for participants who are not covered by insurance are South-eastern Anatolia (13%), Aegean (11%) and İstanbul (11%). On the other hand, in North-eastern Anatolia, Eastern Central Anatolia and South-eastern Anatolia regions, it is seen that Yeşil kart is the most frequent health insurance type (varying between 36% and 38%) (Figure 3.8).

The rate of Yeşil kart owners is the highest in the uneducated population (29%); this rate is 37% in males and 27% in females. The lowest rate for not being covered by insurance is seen in the high school and higher education group.

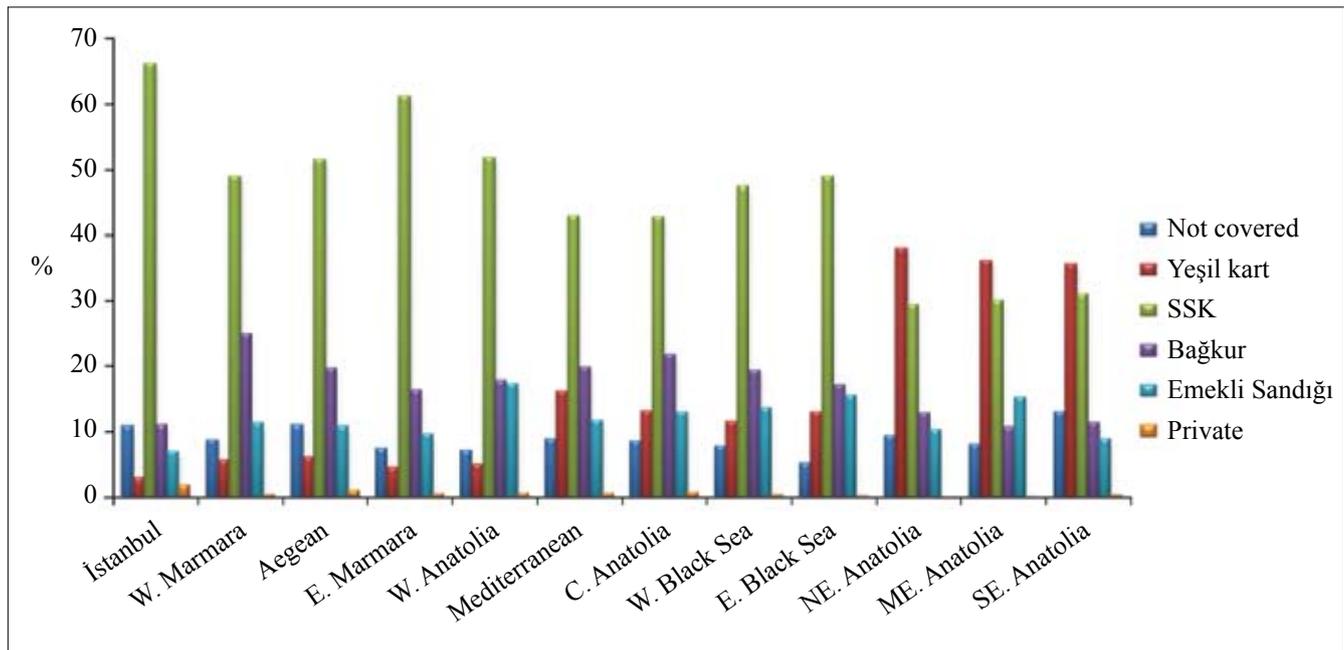


Figure 3.8 Type of health insurance by NUTS1 Regions, Turkey 2011.

Age of First Marriage and Fertility In Females

The mean age of first marriage in females is 19 years; this age is higher in females with high school or higher education (22 years) than females with lower education levels; higher in females living in urban areas (19 years) than the ones living in rural areas (18 years). The median age of first marriage is 17 years for uneducated females. When evaluated in terms of NUTS1 regions, the oldest age of first marriage belongs to females living in İstanbul (20 years) (Table 3.8).



Table 3.8 Age of first marriage in female according to educational status, NUTS1 regions and area of residence, Turkey 2011.

	Age of first marriage			
	n	Mean±sd	95% CI	Median
Educational status				
Uneducated	2408	17,9±3,3	17,8-18,0	17
Primary School Graduate	3797	19,5±3,5	19,4-19,6	19
Secondary school graduate	1309	19,7±4,0	19,4-20,1	19
High school and Higher	2178	22,8±4,3	22,6-23,1	22
NUTS1 regions				
İstanbul	1406	20,5±4,4	20,2-20,7	20,0
Western Marmara	371	20,0±3,9	19,6-20,4	19,0
Aegean	1166	19,7±3,8	19,4-19,9	19,0
Eastern Marmara	735	19,9±3,9	19,6-20,2	19,0
Western Anatolia	815	19,2±3,6	19,0-19,5	19,0
Mediterranean	955	20,0±4,6	19,7-20,3	19,0
Central Anatolia	416	18,4±3,4	18,1-18,8	18,0
Western Black Sea	523	19,0±3,6	18,7-19,3	18,0
Eastern Black Sea	271	19,5±3,8	19,1-20,0	19,0
North Eastern Anatolia	200	19,1±3,5	18,7-19,6	18,0
Middle Eastern Anatolia	272	19,1±3,6	18,7-19,6	19,0
South Eastern Anatolia	566	18,7±3,7	18,4-19,0	18,0
Area of residence				
Rural	2224	18,9±3,6	18,7-19,0	18
Urban	5351	19,9±4,1	19,8-20,0	19
Total*	7698	19,6±4,0	19,5-19,7	19,0

* Included female with age of first marriage data

Some characteristics pertaining to fertility are presented in Table 3.9. Accordingly, 67% of females stated that they have still menstruated; the rate for the ones who stated that they had gone through menopause is 33%.



Table 3.9 Fertility related characteristics, Turkey 2011.

Fertility characteristics	n	%
Still menstruating	6375	67,4
In menopause	3081	32,6
Total	9456	100,0
Reasons for going through menopause		
Natural menopause	2227	72,9
Surgery	373	12,2
Hormones	100	3,3
Unknown	355	11,6
Total	3055	100,0

3.4 Discussion

The average household size is 3.42. Females comprise 55% of the household population. Mean household size was reported as 3.9 in DHS 2008 Survey (4). When the distribution of household population by age groups is compared to the TURKSTAT 2010 population data, it is seen that population below 15 years of age is lower, and working age population (15-64 age group) is higher; the rates for 65-and-above population are similar (3). When the distribution with regard to area of residence is considered, 71% of the participants live in urban areas. When NUTS1 regions are evaluated, it is seen that 18% of the interviewees live in İstanbul. According to TURKSTAT 2010 data 76.8% of the population live in province and town centres, 23.2% live in village and countries; again according to TURKSTAT data, 18.2% of the population live in İstanbul (3).

In this survey 11% of the participants are illiterate. According to UN-UNESCO 2005-2008 statistics adult (15 and above) literacy rate in Turkey is 89% (5). In accordance with the present data about Turkey, males are more educated than females, in all age groups. The education inequality between sexes is seen clearly in the evaluations done with regard to area of residence and NUTS1 regions as well as age groups. 16% of the females in 15-49 age group are uneducated; according to the results of DHS 2008, the rate for uneducated females in this age group is 18% (4). Again in accordance with the present data, individuals living in urban areas are more educated than the ones living in rural areas.

When the data on jobs and employment are considered, the total unemployment rate, comprised of the participants who have been unemployed for the last month and who are looking for jobs and housewives looking for jobs, is 9%. According to TURKSTAT data, the unemployment rate for the period in which the survey data was collected is also 9%; however, it should be considered that there may be differences in the definition of unemployment (3).

Another defining characteristic for the participants is the type of health insurance. According to the results of the study 9% of the population above 15 years of age are not covered by insurance; the rate of Yesil kart owners is 12%. It is reported that 85% of the population is covered by health insurance by



2003, and this rate increased up to 94% by 2008 (6). According to DHS-2008 data, 16% of the females in 15-49 age group are not covered by any of the health insurance systems; the rate for Yesil kart owner females is 14%. The rate for the females who are not covered by health insurance is 9% in this study; the rate for yesil kart ownership is the same (14%).

In conclusion, this section presents the data about the age and sex characteristics of the household population and the data on some defining characteristics of 18.477 study respondents, with complete age and sex data, who are above 15 years of age, in order to enable the evaluation of the chronic diseases and risk factors to be discussed in the following sections.



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4

Smoking





4 Smoking

Professor Gül ERGÖR

Key Findings

- 43% of males and 17% of females smoke cigarettes in 2011.
- Smoking prevalence varies by age groups; the highest smoking prevalence is in 25-44 age group.
- The highest rate for quitting smoking is in 55-and-above ages in males and 45-and-above ages in females.
- While males smoke an average of 17.2 cigarettes a day, females smoke 11.0 cigarettes.
- Smoking is more prevalent in urban areas than rural areas (31% and 25% respectively).
- The rate for the individuals who have quit smoking is 9%, and 57% of them tried to quit smoking.
- The use of other tobacco products such as hookah, cigars and pipe, is 3%.
- In 37% of houses and 23% of workplaces smoking is permitted.



4.1 Introduction

Smoking is one of the primary avoidable causes of death. According to WHO, 5 millions of deaths occur in the world due to smoking every year and this number is expected to reach 8 million by 2030(1). Since Turkey is a tobacco producing country tobacco consumption is quite high in Turkey. Turkey is the tenth among the countries in which tobacco is consumed the most.

Smoking control activities have been continued for a long time in Turkey. Smoking in closed public areas was banned by the adoption of the Law no 4207 in 1996 (2).

In 2003, a public health convention was published by WHO, for the first time. Turkey, signed the “Framework Convention on Tobacco Control” and adopted it in 2004 (3). In the following period, the scope of the law was expanded in 2008, and it has been totally applied since 2009 (4). The reflections of these practices have started to be seen in the prevalence of smoking and quitting smoking.

In the first studies conducted nation-wide, tobacco use was reported as 44% in 1988 (63% for males and 24% for females). In the Household Survey within the National Disease Burden – Cost Effectiveness study in 2003, the rate of smoking was determined as 51% males and 19% in females, and 33% in total (5). In TURDEP II study, conducted for determining the prevalence of diabetes, smoking prevalence was reported as 17% (6). Lastly, according to the findings of Global Adult Tobacco Survey (GATS), the prevalence was found 48% for males, 15% for females and 31% in total (7).

4.2 Methods and Definitions

Smoking is classified as regular (one cigarette per day), occasional, smoked but quit, not smoking. The age for starting regular smoking was asked. Smokers were asked whether they had thought quitting, the ones who had tried quitting were asked whether they thought trying again, and the ones who had not tried were asked whether they thought trying. Also, questions about smoking in the house and in the workplace were placed in the survey form. When the denominators of percentages in the tables were less than 50 the percentages were given in parenthesis.

4.3 Findings

In total 62% of the participants are non- smoker, 24% of them are regular smokers, 6% are occasional smokers and 9% of them past smoker. While 37% of males smoke regularly, 12% of females are regular smokers. With the occasional smokers, smoking rate is 43% for males and 17% for females (Fig. 4.1). While the highest smoking rates are seen in 25-44 age group, the highest quitting rates are in 55-and above ages (Table 4.1).

Table 4.1 Smoking status by age groups and in male and female, Turkey 2011.

	Non-smoker	Regular Smoker	Occasional Smoker	Past smoker	Total
Male	%	%	%	%	Number
15-24	58,7	29,7	8,6	3,0	1713
25-34	38,3	48,4	8,0	5,3	1841
35-44	39,2	44,7	5,4	10,8	1711
45-54	35,3	38,4	6,6	19,7	1460
55-64	36,5	31,0	(3,9)	28,7	1082
65-74	42,6	20,4	(5,3)	31,7	589
75+	54,5	(9,5)	(1,5)	34,5	336
Total	42,7	36,8	6,4	14,1	8732
(% 95 CI)	(41,6- 43,7)	(35,8-37,8)	(5,9-6,9)	(13,4-14,9)	
St. Prevalence*	43,35	37,26	6,67	12,76	
Female					
15-24	87,9	6,9	4,4	(0,8)	1858
25-34	73,4	17,0	7,0	2,6	2021
35-44	71,4	18,6	6,0	4,1	1876
45-54	73,6	15,2	5,3	5,9	1709
55-64	85,0	6,5	(3,3)	5,2	1136
65-74	91,0	(3,3)	(0,8)	(5,0)	641
75+	92,7	(1,6)	(1,4)	(4,3)	441
Total	79,2	12,2	4,9	3,6	9682
(% 95 CI)	(78,4-80,1)	(11,6-12,9)	(4,5-5,3)	(3,3-4,0)	
St.Prevalence*	79,54	12,07	4,93	3,48	
Total Prev	61,9	23,8	5,6	8,6	
(% 95 CI)	(61,2-62,6)	(23,2-24,5)	(5,3-5,9)	(8,2-9,0)	
St.Prevalence**	61,49	24,63	5,80	8,11	

* Standardized using age distribution

* Standardized using age and sex distribution

Istanbul, Western and Eastern Marmara, Eastern Central Anatolia and North-eastern Anatolia regions are the regions with the highest smoking prevalence. Western and Eastern Black Sea regions are the regions with the lowest smoking rates and together with Western Anatolia, the regions with the highest quitting rate (Table 4.2). Smoking is more prevalent in urban areas than in rural areas (31% and 25% respectively).

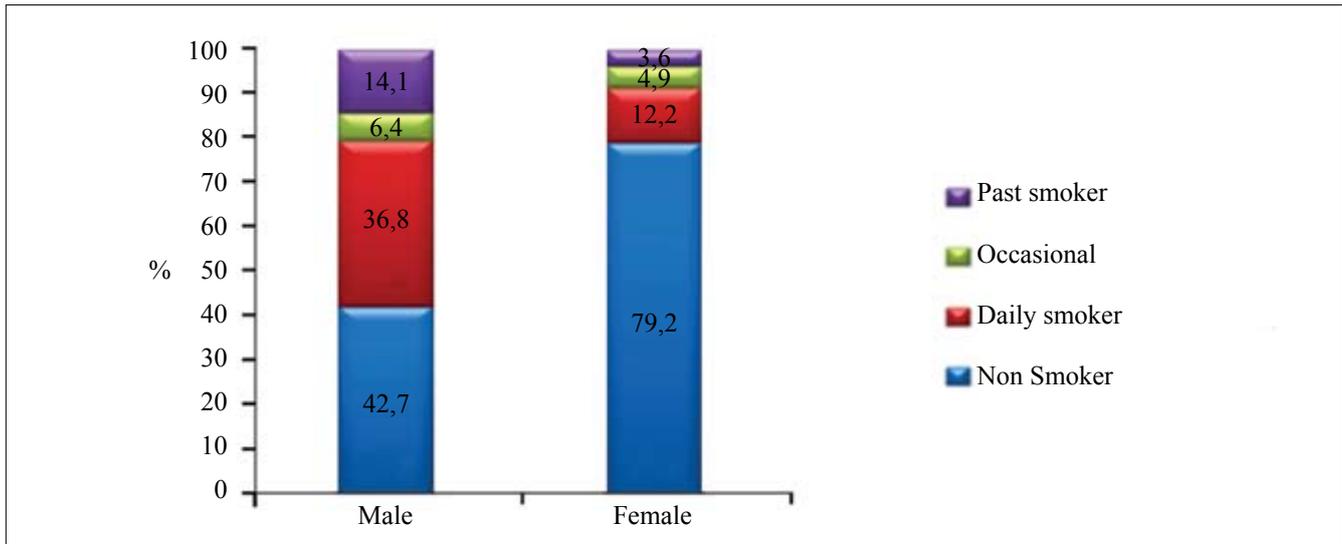


Figure 4.1 Smoking status by sex, Turkey 2011.

Table 4.2 Smoking Prevalence by NUTS1 Regions, Turkey 2011.

	Non-smoker	Regular Smoker	Occasional Smoker	Quitter	Total
NUTS1 Regions					
İstanbul	57,6	25,9	7,4	9,1	3383
Western Marmara	59,1	26,9	(5,2)	8,8	863
Aegean	61,5	24,3	5,1	9,0	2569
Eastern Marmara	58,3	26,4	6,0	9,2	1778
Western Anatolia	62,0	23,5	4,7	9,8	1776
Mediterranean	65,2	22,3	4,9	7,6	2325
Central Anatolia	62,9	23,2	(5,1)	8,8	964
Western Black Sea	67,0	19,3	(3,8)	9,9	1186
Eastern Black Sea	65,9	17,8	(6,7)	9,7	659
North Eastern Anatolia	62,0	24,5	(5,4)	(8,2)	503
Middle Eastern Anatolia	62,7	24,7	7,3	(5,3)	810
South Eastern Anatolia	65,7	22,7	5,1	6,5	1574
Area of residence					
Rural	66,6	20,2	4,6	8,6	5323
Urban	59,9	25,3	6,1	8,6	12775

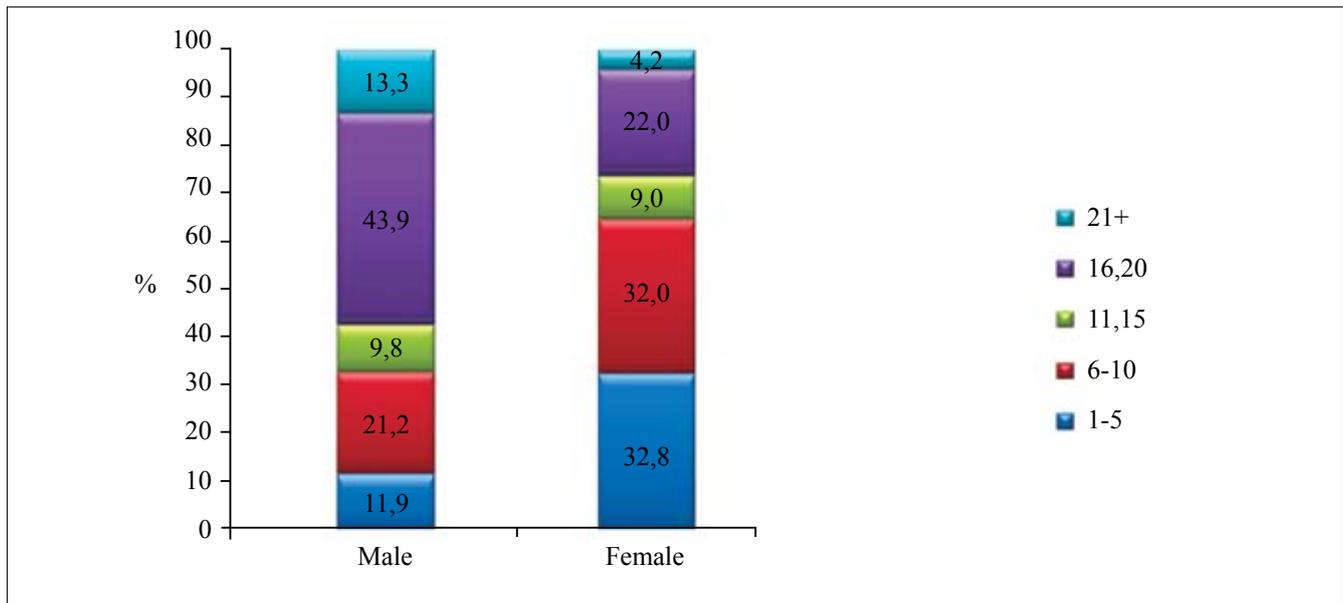


Figure 4.2 Number of cigarettes smoked per day by sex, Turkey 2011.

While 18% of smokers consume 1 to 5 cigarettes per day, 24% consume 6 to 10 cigarettes, 10% consume 11 to 15 cigarettes and 38% consume 16 to 20 cigarettes, 11% consume more than one pack. The largest group in all age groups is the ones who smoke 16 to 20 cigarettes per day. While 44% of males smoke 16 to 20 cigarettes per day, 22% of females smoke the same amount (Table 4.3, Fig 4.2). Males smoke an average of $17,2 \pm 9,7$ cigarettes per day, and females smoke an average of $11,0 \pm 8,0$ cigarettes.

Table 4.3 Number of cigarettes smoked by age groups and sex, Turkey 2011.

Age Groups	Number of Cigarettes					Total
	1-5	6-10	11-15	16-20	21+	
15-24	25,6	28,5	12,4	29,2	4,3	806
25-34	18,7	25,5	9,4	37,1	9,3	1433
35-44	16,6	22,1	9,3	39,7	12,2	1269
45-54	14,6	24,4	8,1	38,7	14,2	948
55-64	14,6	19,9	7,1	45,2	13,3	467
65-74	12,0	23,4	15,6	36,5	12,6	167
75+	31,3	22,9	4,2	29,2	12,5	48
Male	11,9	21,2	9,8	43,9	13,3	3629
Female	32,8	32,0	9,0	22,0	4,2	1507
Total	18,0	24,3	9,6	37,4	10,6	5136
% 95 CI	(16,9-19,1)	(23,2-25,5)	(8,8-10,4)	(36,1-38,8)	(9,8-11,5)	

Among the smokers 57% had tried to quit smoking. While the ones who thought of quitting but could not succeed are 26%, the ones who did not think of quitting and will not attempt in the future are 35% (Table 4-4, Fig 4-3).



Table 4.4 Quitting smoking by age groups and sex, Turkey 2011.

Have you tried quitting smoking?					
Age Groups	I have tried		I have not tried		Total
	I will try again	I will not try again	I think of quitting	I do not think of quitting	
15-24	37,2	15,8	27,3	19,7	854
25-34	41,0	17,7	25,0	16,3	1511
35-44	37,8	17,9	27,1	17,2	1295
45-54	40,3	16,1	24,3	19,2	994
55-64	41,4	18,9	25,6	14,1	481
65-74	35,8	(25,4)	(18,5)	(20,2)	173
75+	(30,6)	(22,4)	(12,2)	(34,7)	49
Sex					
Male	40,8	18,2	24,6	16,4	3722
Female	35,9	16,1	27,4	20,6	1632
Total	39,3	17,5	25,5	17,7	5354
% 95 CI	(37,9-40,6)	(16,5-18,6)	(24,3-26,7)	(16,7-18,7)	

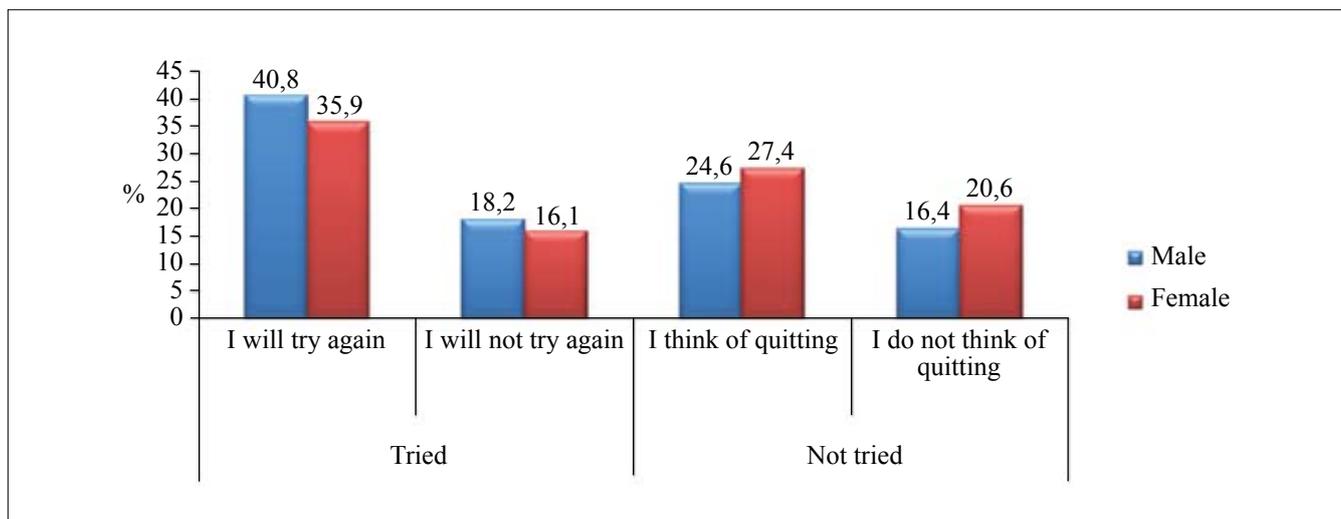


Figure 4.3 Percentage of males and females who intended to quit smoking, Turkey 2011.

Consumption of other tobacco products such as hookah, cigars and pipe is about 3%. While this rate is 8% in 15-24 age group, it is below 1% in 45-54 age group and in older groups. It is 5% in males and 1% in females (Table 4.5).

Table 4.5 Consumption of hookah, cigars or pipe by age groups and sex, Turkey 2011.

Hookah, cigars and pipe consumption (%)					
Age groups	No	Yes, regularly	Yes, occasionally	Quitter	Total
15-24	92,5	0,2	7,3	0,1	3224
25-34	96,1	0,2	3,6	0,1	3729
35-44	98,2	0,2	1,5	0,1	3440
45-54	98,8	0,3	0,6	0,3	3018
55-64	99,0	0,2	0,4	0,4	2128
65-74	99,2	0,1	0,4	0,3	1181
75+	99,2	0,1	0,1	0,5	743
Male	94,6	(0,3)	4,7	(0,4)	8466
Female	99,1	(0,1)	0,8	-	9197
Total	97,0	(0,2)	2,7	(0,2)	17663
% 95 CI	(96,7-97,2)	(0,1-0,3)	(2,4-2,9)	(0,1-0,3)	

The age for starting smoking is 18.3 ± 6.0 mean with a median 17. The median for age of starting smoking is 17 for males and 18 for females (Table 4.6).

Table 4.6 Descriptive statistics about the age of starting smoking, Turkey 2011.

The age of starting smoking					
	Mean	Standard Deviation	Median	%25, %75 Quartile	Number
Male	17,4	5,2	17	15- 20	3767
Female	20,3	7,0	18	16- 22	1643
15-24	15,8	2,8	16	14- 18	864
25-34	17,5	3,9	17	15- 20	1522
35-44	18,7	5,2	18	15- 20	1306
45-54	19,4	6,6	18	15- 21	1006
55-64	20,0	8,6	18	15- 22	484
65-74	21,3	10,3	20	15- 25	176
>75	26,7	18,2	20	15- 35	52
Total	18,3	6,0	17	15-20	5410



Table 4.7 and 4.8 present the rates for exposure to cigarette smoke in the houses and workplaces.

In 27% of the houses cigarettes are consumed every day, and in 10% occasionally. These rates are 17% and 6%, respectively, in the workplaces (Fig 4.4, 4.5).

Table 4.7 Smoking in the house by age groups and sex, Turkey 2011.

Smoking in the House				
Age groups	No	Yes, every day	Yes, occasionally	Total
15-24	51,4	37,3	11,3	3498
25-34	62,9	26,7	10,4	3788
35-44	62,7	26,3	10,9	3524
45-54	63,6	27,4	9,0	3129
55-64	68,1	22,6	9,2	2175
65-74	74,5	16,8	8,6	1206
75+	80,3	12,3	7,4	758
Male	68,1	22,1	9,8	8609
Female	58,2	31,5	10,3	9466
Total*	62,9	27,0	10,1	18076
% 95 CI	(62,2-63,6)	(26,4-27,7)	(9,6-10,5)	

* Total according to sex

Table 4.8 Smoking in the workplace by age groups and gender, Turkey 2011.

Smoking in the Workplace				
Age groups	No	Yes, every day	Yes, occasionally	Total
15-24	67,2	27,0	5,9	957
25-34	76,0	17,5	6,6	1951
35-44	78,0	15,1	6,9	1872
45-54	79,4	14,6	6,1	1139
55-64	81,5	13,5	(5,1)	394
65-74	91,4	(6,5)	(2,2)	93
75+	(96,8)	(3,2)	-	31
Male	74,8	18,6	6,6	5086
Female	83,1	11,9	5,0	1351
Total*	76,5	17,2	6,3	6437
% 95 CI	(75,5-77,6)	(16,3-18,1)	(5,7-6,8)	

* Total according to sex

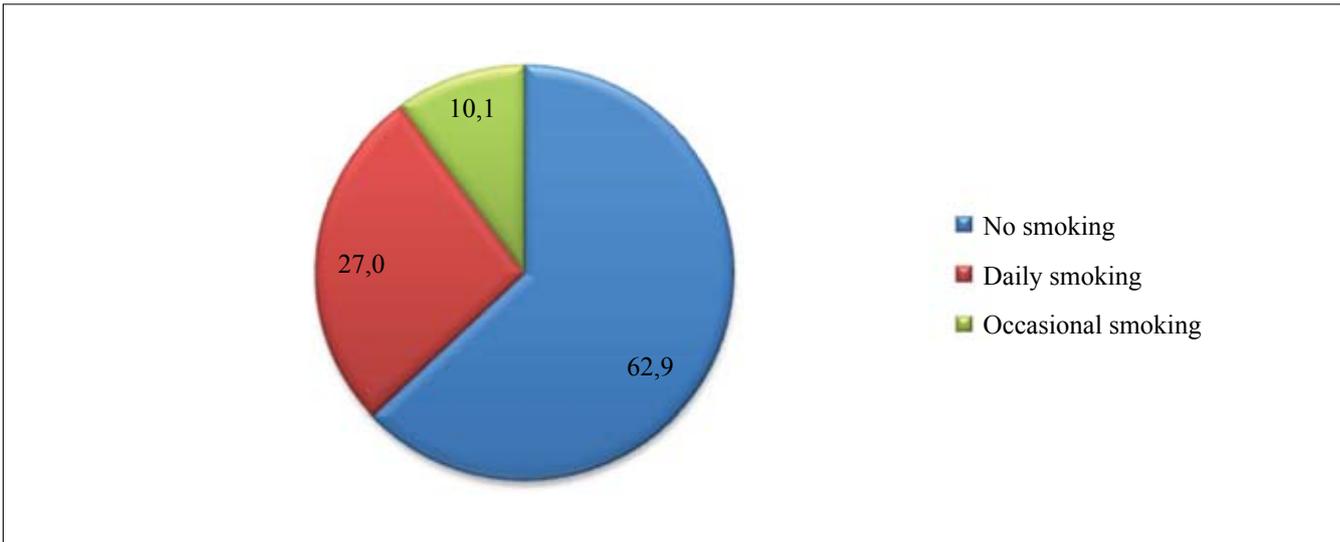


Figure 4.4 Smoking in the houses, Turkey 2011.

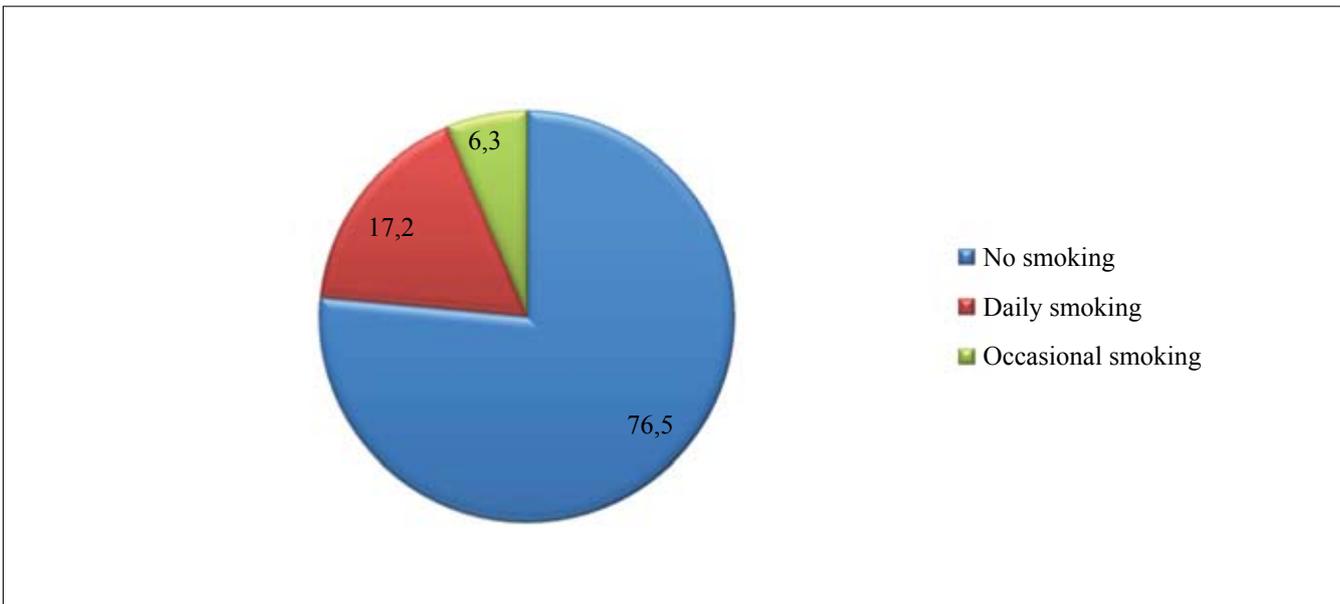


Figure 4.5 Smoking in the workplaces, Turkey 2011.



4.4 Discussion

Smoking prevalence is found similar to results of the previous studies. When compared to the results of the latest GATS, smoking prevalence in this study is found slightly lower in males, and slightly higher in females, considering the confidence intervals (7). When the findings for 15-24 age group are considered, any difference from the GATS results could not be found (7). It can be said that struggle against tobacco and preventing individuals from starting smoking have not been practiced effectively enough.

The median age of starting smoking is 17 and the rate for regular smoking and the number of the cigarettes consumed per day increased after this age. The decrease of the age for starting smoking to 16 in the young age groups, could be resulted from reporting the age of regular smoking higher with the increasing age, or age of starting smoking may actually be early in the younger population. In addition to this, the rate for quitting reaches up to 30% and above after 44 and 54 years of age. These results indicate that individuals tend towards quitting after seeing the harmful effects of smoking.

While there are not great differences between regions, the regions with the highest prevalence is İstanbul and Marmara regions, indicating that smoking issues should be considered more seriously in the Western regions with dense urban areas. It is seen that the rate of quitting is the highest in Black Sea region where smoking prevalence is the lowest also.

More than half of the smokers had tried quitting, and a quarter of them had thought of quitting; these findings show that the awareness about the harmful effects of smoking is quite developed in smokers, and the smoking cessation services should be popularised in Turkey.

While the consumption of tobacco products, other than cigarettes, is not high, it is striking that this rate is relatively higher in the younger population in the 15-24 age group. It should be noted that the cafés in which hookahs are consumed are places for socialisation for the youth, and legal regulations regarding these places should be implemented.

While the exposure to cigarette smoke in the houses is 60% in GATS-2008, it is 37% in this study. A similar decrease is seen for the workplaces; the rate, which is 39% in 2008, is 23% in this study. It is thought that the awareness-raising for the struggle against tobacco in the society via media, especially visual media, and the expansion of the Law no 4207 in 2008 caused these results.

It is seen that females are exposed passive smoking more than males, by the 10% difference in the answers given to the question about smoking in the houses. However the situation is reversed in the workplaces. In the workplaces of males, there is more smoking, when compared to the workplaces of females. This might be resulted from the fact that females work mostly in the line of business that females work.

Struggle against smoking is not a process that can yield results rapidly. Therefore, this endeavour should be continued in a multifaceted way with legal, economic and social measures.



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5

Alcohol





5 Alcohol

Professor Gül ERGÖR

Key Findings

- 8% of the participants use alcohol once a month or less, 3% use 2-4 times a month, 2% more frequently; a total of 13% use alcohol.
- 23% of males and 4% of females use alcohol, by 2011.
- Alcohol use prevalence varies between age groups; the highest alcohol use prevalence is in 35-44 age group.
- Consumption of 5 or more standard beverages a day, which is the risky consumption, is 7% (8% in males, and 1% in females).
- Alcohol use is 11% in rural areas and 14% in urban areas.
- The highest alcohol prevalence is 20% in Western Marmara region, followed by Aegean region and İstanbul. The lowest consumption is in South-eastern Anatolia region.



5.1 Introduction

World Health Organisation (WHO) reports that 2 billions of people in the world use alcohol and 76.3 million people have alcohol use disorder. Alcohol use is in the third place among the risk factors which constitute the global disease burden in the world (1). Alcohol use related deaths cause 4% (2.5 millions) of all deaths; this number is more than the sum of deaths caused by HIV/AIDS, violence and tuberculosis. It is known that alcohol is a risk factor for oral, oesophagus, liver and breast cancers. It also causes cardiovascular diseases such as stroke and hypertension. In addition to these health issues, alcohol's having other social effects such as violence, accidents and injuries increases its importance in terms of public health(2).

According to the National Burden of Disease - Cost Effectiveness(NBD-CE) Study in 2003, lifelong alcohol use rate in the population above 18 years of age is 19% (34% in males, 8% in females)(3). According to the World Health Survey Turkey data, heavy and dangerous alcohol use rate (40 grams or more pure alcohol consumption per day for males, and 20 grams or more for females) is 1% (2% in males and 0.5% in females). Heavy episodic drinking habit (5 or more standard beverages in one sitting) is 1% (2% in males and 1% in females). According to the WHO Report 2011, alcohol consumption per capita is less than 3 litres in Turkey. This amount is quite low compared to 6 litres per capita, which is the world average (1).

5.2 Methods and Definitions

In order to determine alcohol consumption, drinking frequency, the amount drank daily, and frequency of drinking five or more standard beverages in one sitting as a risky drinking habit were asked. For standard beverage definition, 1 small beer, 1 glass of wine, 1 single rakı or 1 single vodka was used. A large beer equals to 1.5 standard beverages. Heavy episodic drinking habit, one of the risky alcohol uses, was defined as drinking 5 or more standard beverages in one sitting. When the denominators of percentages in the tables were less than 50 the percentages were given in parenthesis.

5.3 Findings

In total 87% of the participants stated that they had never used alcohol, 8% of them drank alcohol once a month or less and 3% of the participants used 2-4 times a month. Only 13% of the participants used alcohol (Fig. 5.1). While 23% of males drink alcohol, 4% of females drink alcohol. 14% of male drinkers use alcohol once a month or less, 5% of them use 2-3 times a week or more. Most of the females (3%) use alcohol once a month or less .

Alcohol use is the highest in the age group 35-44, both in males (28%) and females (6%) Drinking 2-3 times or more in a week, is highest in males 45-54 (6%) and 5% in 55-64 age group (Table 5.1).

Table 5.1 Prevalence of alcohol use by age and sex, Turkey 2011.

	No use	Once a month or less	2-4 times a month	2-3 times a week or more	Total
Male	%	%	%	%	
15-24	77,3	15,0	4,8	2,8	1697
25-34	74,1	15,7	5,4	4,8	1840
35-44	72,5	16,6	6,3	4,6	1706
45-54	75,5	12,1	6,0	6,4	1459
55-64	77,8	13,2	3,7	5,4	1079
65-74	85,6	9,1	(1,9)	(3,4)	585
75+	94,6	(2,4)	(0,6)	(2,4)	336
Total male	76,7	13,9	4,9	4,5	8702
% 95 CI	(75,8-77,6)	(13,1-14,6)	(4,5-5,4)	(4,1-5,0)	
Total male*	76,41	14,12	5,01	4,45	
Female					
15-24	95,6	3,4	(1,0)	(0,1)	1850
25-34	94,6	4,2	(0,9)	(0,2)	2005
35-44	94,1	4,5	(1,0)	(0,4)	1869
45-54	96,2	3,2	(0,4)	(0,3)	1701
55-64	97,4	(1,9)	(0,4)	(0,3)	1135
65-74	99,4	(0,5)	-	(0,2)	635
75+	99,8	(0,2)	-	-	437
Total female	95,9	3,2	0,7	(0,2)	9632
% 95 CI	(95,5-96,3)	(2,9-3,6)	(0,5-0,9)	(0,1-0,3)	
Total female*	95,82	3,26	0,71	0,23	18334
Total(% 95 CI)	86,7 (86,3-87,3)	8,3 (7,9-8,7)	2,7 (2,5-2,9)	2,3 (2,1-2,5)	
Total*	86,1	8,7	2,9	2,3	

* Standardized using 2010 population age distribution of Turkey

Most of the alcohol users (71%) stated that they drank 1-2 standard beverages a day, and 22% stated that they drink 3-4 standard beverages a day. Consumption of 5 or more standard beverages a day is 7%. This consumption is 8% in males (Table 5.2). While 59% of the drinkers stated that they had never drunk 5 or more standard beverages in one sitting, 2% of them stated that they had drunk this way almost every day (the data is not presented in the table).

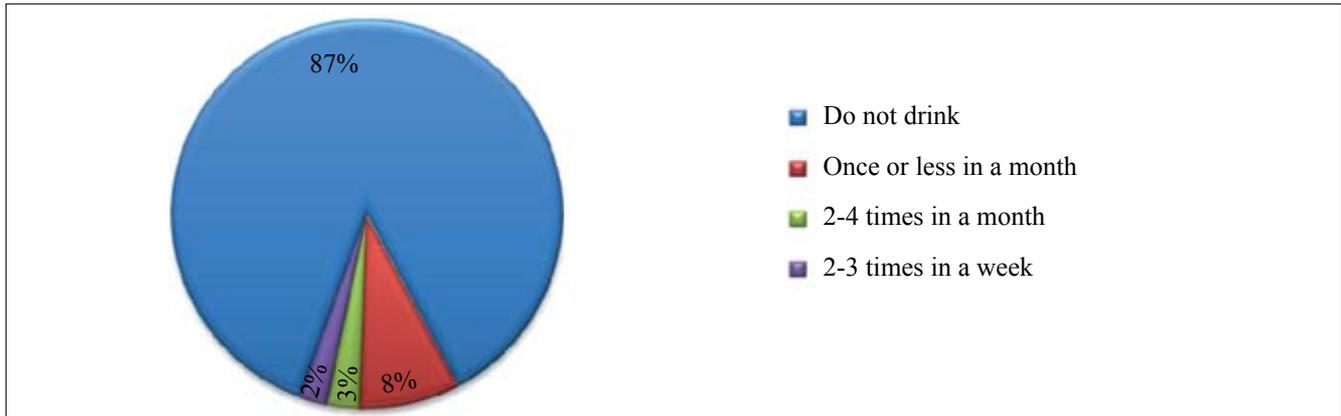


Figure 5.1 Alcoholic beverage use, Turkey 2011.

Table 5.2 Distribution of daily amount of alcohol use by age and sex among the participants who stated alcohol use, Turkey 2011.

	Daily amount of alcohol use (standard beverages)			Total (n)
	1-2	3-4	> 5	
Male				
15-24	66,0	23,4	(10,6)	377
25-34	65,7	26,0	(8,3)	469
35-44	66,8	26,8	(6,4)	455
45-54	63,4	29,6	(7,0)	347
55-64	72,6	(20,5)	(6,8)	234
65-74	81,0	(16,7)	(2,4)	84
75+	(86,7)	(13,3)	-	15
Total male	67,2	25,2	7,8	1981
% 95 CI	(65,2-69,3)	(23,3-27,1)	(6,4-8,7)	
Total male	67,8	24,6	7,6	
Female				
15-24	90,0	(5,0)	(5,0)	80
25-34	88,9	(10,2)	(0,9)	108
35-44	91,7	(8,3)	-	109
45-54	90,2	(9,8)	-	61
55-64	96,8	(3,2)	-	31
65-74	75,0	(25,0)	-	4
75+	(100,0)	-	-	1
Total female	90,6	(8,1)	(1,3)	394
% 95 CI	(87,7-93,5)	(5,4-10,8)	(0,2-2,4)	
Total female	90,3	8,4	1,3	
Total	71,1	22,4	6,5	2375
(% 95 CI)	(69,3-72,9)	(20,7-24,1)	(5,5-7,5)	
Total	79,1	16,5	4,4	

Drinking 5 or more standard beverages is highest in 15-34 age group. However, when the frequency of this habit (once a week or more) is considered, it is seen that this habit is most frequent in 45-54 age group (Table 5-3). The rate for males who consume alcohol this way every day is 3% (data is not presented in the table).

Table 5.3 Distribution of drinking five or more standard beverages in one sitting by age and sex, Turkey 2011.

Frequency of drinking five or more standard beverages in one sitting					
	Never	Once a month or less	Once a month	Once a week or more	Total
Male					
15-24	55,7	22,5	13,3	(8,5)	377
25-34	55,6	22,6	12,2	(9,6)	468
35-44	59,5	18,3	13,9	(8,2)	447
45-54	61,9	17,0	(6,3)	14,8	352
55-64	64,7	15,3	(9,8)	(10,3)	235
65-74	(59,0)	(27,7)	(7,2)	(6,0)	83
75+	(73,3)	(13,3)	(13,3)	-	15
Total male	59,0	19,9	11,2	9,9	1977
% 95 CI	(56,8-61,2)	(18,2-21,7)	(9,8-12,6)	(8,5-11,2)	
Total male	59,0	20,1	11,4	9,5	
Female					
15-24	79,7	(15,2)	(2,5)	(2,5)	79
25-34	88,5	(8,7)	(1,9)	(1,0)	104
35-44	86,0	(8,4)	(2,8)	(2,8)	107
45-54	(81,4)	(16,9)	(1,7)	-	59
55-64	(81,3)	(18,8)	-	-	32
65-74	(100,0)	-	-	-	4
75+	(100,0)	-	-	-	1
Total female	84,5	(11,9)	(2,1)	(1,5)	386
%95 CI	(80,8-88,1)	(8,7-15,2)	(0,7-3,5)	(0,3-2,8)	
Total female	85,5	11,5	1,8	1,3	
Total male+female	63,2	18,6	9,7	8,5	2363
%95 CI	(61,3-65,2)	(17,1-20,2)	(8,5-10,9)	(7,3-9,6)	
Total male+female	72,3	15,8	6,5	5,4	

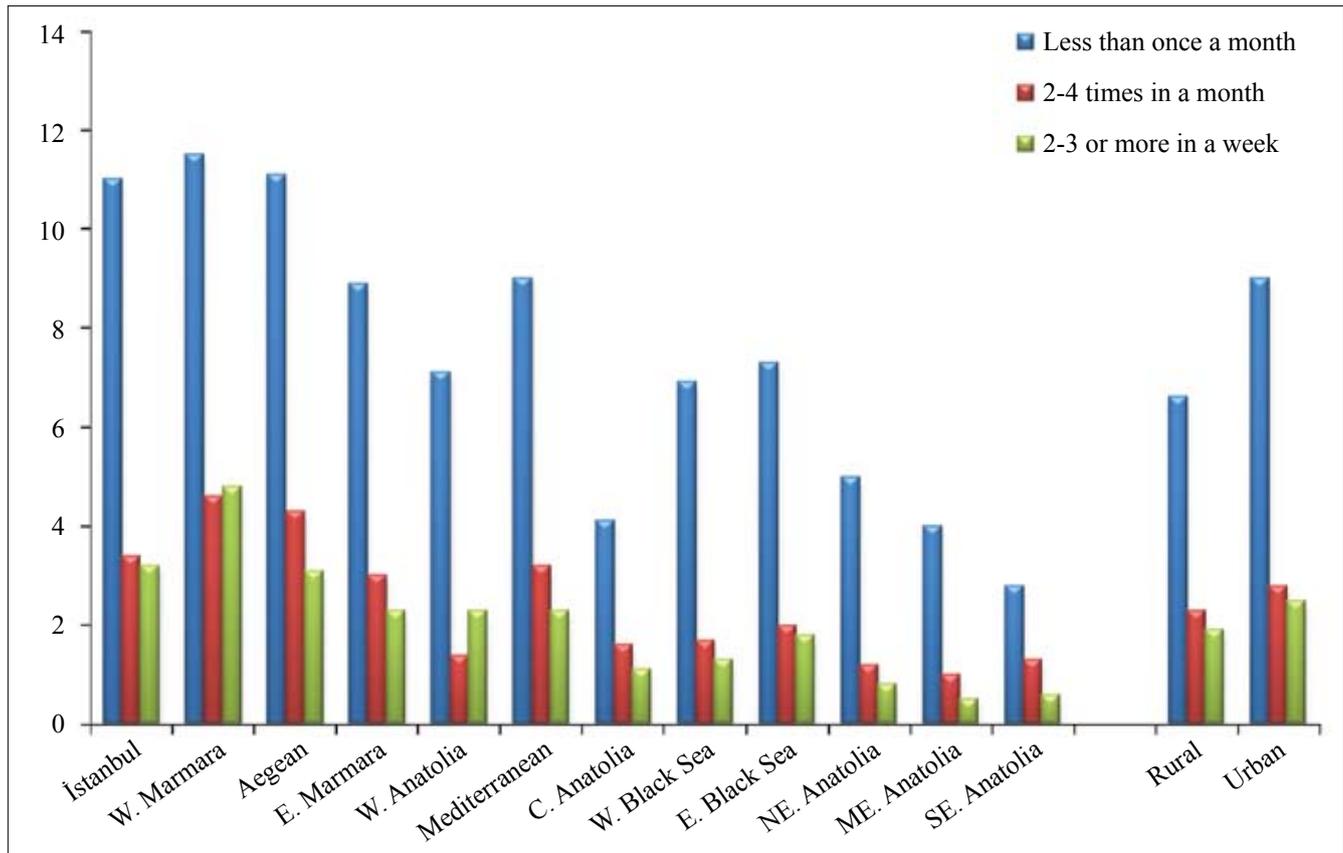


Figure 5.2 Prevalence of alcohol use by NUTS1 regions, Turkey 2011.

When alcohol use is considered in terms of NUTS1 regions, it is seen that the highest use is in Western Marmara region with a 20% rate. Aegean region and İstanbul follow this region. The lowest alcohol use is in South-eastern Anatolia, Eastern Central Anatolia and Central Anatolia (5%),(Table 5.4). Drinking five or more standard beverages a day among drinkers is 13% in Central Anatolia, 11% in Western Black Sea and 10% in South-eastern Anatolia. Since these rates depend on a smaller number of observations, they should be evaluated carefully (Table 5.5).

Table 5.4 Prevalence of alcoholic beverage use by NUTS1 regions and area of residence, Turkey 2011.

	None	Once a month or less	2-4 times a month	2-3 time a week or more	Total
NUTS1 regions					
İstanbul	82,4	11,0	3,4	3,2	3383
Western Marmara	79,1	11,5	(4,6)	(4,8)	861
Aegean	81,5	11,1	4,3	3,1	2559
Eastern Marmara	85,7	8,9	3,0	(2,3)	1772
Western Anatolia	89,2	7,1	(1,4)	(2,3)	1776
Mediterranean	85,5	9,0	3,2	2,3	2325
Central Anatolia	93,2	(4,1)	(1,6)	(1,1)	960
Western Black Sea	90,1	6,9	(1,7)	(1,3)	1181
Eastern Black Sea	88,8	(7,3)	(2,0)	(1,8)	654
North Eastern Anatolia	93,0	(5,0)	(1,2)	(0,8)	500
Middle Eastern Anatolia	94,6	(4,0)	(1,0)	(0,5)	809
South Eastern Anatolia	95,3	(2,8)	(1,3)	(0,6)	1562
Area of residence					
Rural	89,2	6,6	2,3	1,9	5306
Urban	85,7	9,0	2,8	2,5	12716
Prevalence*	86,7	8,3	2,7	2,3	18022
% 95 CI	(86,3-87,3)	(7,9-8,7)	(2,5-2,9)	(2,1-2,5)	

* Total according to area of residence

Alcohol use prevalence in rural and urban areas is similar, in urban areas being slightly higher (11% and 14% respectively) (Table 5.4).



Table 5.5 Distribution of daily alcohol use by area of residence and NUTS1 regions, Turkey 2011.

NUTS1 regions	Daily alcohol use amount (standard beverages)			Total
	1-2	3-4	> 5	
Istanbul	70,2	24,4	(5,4)	577
Western Marmara	71,6	(21,6)	(6,9)	176
Aegean	72,6	22,5	(4,8)	471
Eastern Marmara	73,9	20,8	(5,3)	245
Western Anatolia	73,2	(17,3)	(9,5)	179
Mediterranean	74,3	18,7	(6,9)	331
Central Anatolia	(53,2)	(33,9)	(12,9)	62
Western Black Sea	62,7	(26,4)	(10,9)	110
Eastern Black Sea	(65,8)	(27,4)	(6,9)	73
North Eastern Anatolia	(72,7)	(21,2)	(6,0)	33
Middle Eastern Anatolia	(90,7)	(7,0)	(2,3)	43
South Eastern Anatolia	(58,4)	(31,2)	(10,4)	77
Area of residence				
Rural	69,3	25,1	(4,7)	566
Urban	71,6	21,6	6,7	1774
Total*	71,1	22,4	6,5	2340

* Total according to area of residence

5.4 Discussion

Alcohol use is a risk factor to be monitored since it causes important health issues and social problems. Alcohol use in Turkey in the previous studies and in this survey is relatively low. Depending on cultural and religious attitudes this figure can be real however underreporting social pressure should also be kept in mind. Although alcohol is consumed lower than the world levels, there are consumers that show risky consumption features. Consumption is highest in males and in 25-44 age group. Drinking 5 or more standard beverages a day is striking in young population especially in young females. In all parts of the world alcohol use of males is higher than females. This difference is prominent in Turkey as well. While heavy episodic drinking is 11% in the world, in general; it is found 4% (standardized prevalence) in this study (4). Alcohol drinking frequency does not always parallel the amount. In some regions where alcohol use prevalence is low, the rate of risky drinkers is high.

In conclusion, alcohol consumption in Turkey is low; however, when the population influenced by risky drinking is taken into consideration, it is seen that preventive and therapeutic services concerning this issue should take part in health policy.



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6

Blood Pressure and Hypertension





6 Blood Pressure and Hypertension

Professor Sibel KALAÇA

Key findings

- Hypertension prevalence based on medical history is 17% among the participants (12% in males, 20% in females).
- 15% of the individuals who state that they have hypertension do not use any medication.
- Approximately 48% of the individuals with high blood pressure measurements also declared hypertension based on physician diagnosis (hypertension awareness); this ratio is 36% in males and 58% in females.
- The total hypertension prevalence based on medical history and measurements is 24%; 21% in males and 26% in females.
- Hypertension prevalence increases with age in both males and females. Hypertension prevalence is higher in female for each age group starting with age group 45-54.
- Prevalence of hypertension is higher in those who live in rural areas (26%) than who live in urban areas (23%).
- The prevalence of hypertension is lowest in South-eastern Anatolia (16%), and the highest in the Western Marmara (35%).
- Overall %30 of the individuals with hypertension has controlled blood pressure and 42% do not receive any treatment.
- Females have higher being not-controlled rate than male (32%) versus (22%).
- More than half of males with hypertension do not receive any treatment (53%).



6.1 Introduction

Hypertension is the most prominent and common of the risk factors for cardiovascular diseases. Considering the differences between continents and regions, 26,4% of the over age 20 population had hypertension, by 2000; and this rate is projected to increase up to 29,2% in 2025 (1,2). In other words, 972 millions of the world population currently have hypertension and this number will go beyond 1,5 billion people after 25 years. Most of the people with hypertension live in the economically developing countries. The reason for hypertension being this frequent in these countries, and its gradual increase is connected to the “epidemiological transition”. In a similar study conducted in six different countries in Europe, it is found that 44% of the 35-and-above population have hypertension (2).

Hypertension is a very common problem in Turkey. In the TEKHARF study in 1990, the high blood pressure frequency in Turkey was found 38% in females and 28,4% in males (3). In the HinT study Conducted in 2007, these rates were found as 59,0% in females and 49% in males (4). The Diabetes, Hypertension, Obesity and Endocrine Diseases Prevalence Study (TURDEP 2), the latest national study, conducted in 2010 (5). In this study, hypertension prevalence was found 32,3% in females, and 30,9% in males over 20 years of age. According to the findings of the Turkish Hypertension Prevalence Study (1), in 2003, the prevalence of hypertension in 18-and-above adult population is 31,8%. It draws attention that this rate is 36,1% in females and 27,5% in males. Hypertension prevalence shows an increase with age. Hypertension prevalence in the geriatric age group (>65), which is gradually increasing in number in Turkey due to increasing lifespan, is 75,1% (1).

In this section, hypertension prevalence in people above 15 years of age is presented. At the same time, the diagnosis, treatment and control ratios are being presented by sex, age, area of residence and NUTS1 regions.

6.2 Methods and Definitions

Hypertension History

Hypertension history was evaluated by asking the question “Do you have hypertension (high blood pressure) diagnosed by a physician?” To the ones who stated that they had physician diagnosed hypertension, questions about whether they used medication regularly, if they had a chronic diseases report, and the brands of the medication they used were asked.

Measurements

Systolic and diastolic blood pressure values were obtained from 16893 individuals. The blood pressure values of the individuals were obtained with a single measurement after they rested at least 15 minutes. A standard protocol was used for the measurement; it was ensured that the person is in a sitting position and the right arm of the person is naked as to allow for blood pressure; systolic blood pressure (SBP) and diastolic blood pressure (DBP) were measured using a stethoscope and a sphygmomanometer.



Definition of Hypertension

For the individuals who have not been diagnosed with hypertension before was diagnosed as “hypertension present” if average SBP \geq 140 mmHg or average DBP \geq 90 mmHg. Individuals who have been diagnosed with hypertension before and who have used antihypertensive medication were considered as “hypertension present” regardless of their blood pressure measurements. Individuals who have been diagnosed with hypertension but have not used any medication were diagnosed as “hypertension present” if average SBP \geq 140 mmHg or average DBP \geq 90 mmHg (6).

Isolated systolic hypertension was defined as SBP \geq 140 mmHg on average and DBP $<$ 90 mmHg on average; isolated diastolic hypertension was defined as SBP $<$ 140 mmHg on average and DBP \geq 90 mmHg on average.

Definitions of Diagnosis, Treatment and Control

The blood pressure levels of the individuals were categorized into four groups by the systolic and diastolic blood pressure levels obtained by measurements and their condition of current use of medications due to hypertension (6).

Normal blood pressure levels – not receiving treatment: SBP $<$ 140 mmHg and DBP $<$ 90 mmHg, not diagnosed with hypertension and not using medications for hypertension.

Hypertensive-controlled: SBP $<$ 140 mmHg and DBP $<$ 90 mmHg, currently using medication due to hypertension

Hypertensive-uncontrolled: SBP \geq 140 mmHg or DBP \geq 90 mmHg, currently using medication due to hypertension

Hypertensive-not receiving treatment: SBP \geq 140 mmHg or DBP \geq 90 mmHg, currently not using medication due to hypertension

Hypertension awareness, is defined for the individuals who declared hypertension based on physician diagnosis among the individuals who were diagnosed with hypertension after the measurements (1).

6.3 Findings

Systolic and Diastolic Blood Pressure Averages By Sex, Age and Area of Residence

Table 6.1 presents the SBP and DPB averages with % CI for the participants. Average measured SBP is as $117,9 \pm 17,5$ (%95 CI: 117,6-118,2), average DBP is $74,1 \pm 11,3$ (%95 CI: 73,9-74,3) in the study group. Average SBP is $118,8 \pm 16,1$ mmHg in males and $117,0 \pm 18,5$ mmHg in females. Average DBP is $74,7 \pm 10,9$ in males and $73,5 \pm 11,5$ in females. In both males and females the average systolic and diastolic blood pressures increase with age. SBP and DBP averages are higher in individuals who live in rural areas than the people living in urban areas (Table 6.1).

**Table 6.1 Systolic and Diastolic Blood Pressure Averages by sex, age and area of residence, Turkey 2011.**

	Systolic Blood Pressure (mmHg)		Diastolic Blood Pressure (mmHg)	
	mean±SD	%95 CI	mean±SD	%95 CI
Sex				
Male	118,8±16,1	118,5-119,2	74,7±10,9	74,5-75,0
Female	117,0±18,5	116,5-117,4	73,5±11,5	73,3-73,7
Age Groups				
15-24	109,3±12,2	108,9-109,7	69,2±9,7	68,9±69,6
25-34	111,2±12,5	110,8-111,6	71,2±9,9	70,9±71,6
35-44	115,4±14,4	114,9-115,9	74,1±10,5	73,8±74,5
45-54	121,7±16,9	121,2-122,4	76,9±11,2	76,5±77,4
55-64	127,9±18,4	127,1-128,7	78,3±11,4	77,9±78,9
65-74	132,1±21,3	130,9-133,4	78,9±12,6	78,2±79,7
75 +	134,4±21,7	132,8-135,9	69,3±9,8	68,9-69,6
Area of Residence				
Rural	120,0±18,4	119,4-120,5	74,9±11,5	74,6-75,2
Urban	116,9±17,0	116,7-117,3	73,7±11,1	73,5-73,9
Total*	117,9±17,5	117,6-118,2	74,1±11,3	73,9-74,3

* was calculated based on the sex

Hypertension Prevalence Defined by Blood Pressure Measurements and Medical History

The prevalence of hypertension based on medical history is 17% in the participants (12% in males and 20% in females). In total 85% of the participants who reported hypertension also declared that they regularly used medication for this disease and 63% had chronic disease prescriptions. Medication use rates are 84% for males and 86% for females and 65% of males and 62% of females have chronic disease prescriptions.

In the study population, the blood pressure was categorized into five groups using to the results obtained from the blood pressure measurements and medical histories. According to this, 76% of the study population had normal blood pressure levels, 10% of the individuals do not use medication although they have hypertension (untreated individuals). Almost all (88%) of the untreated individuals are not aware of their disease or have not been diagnosed with hypertension before. The rate of individuals with hypertension diagnosis and controlled blood pressure is 7% (Table 6.2, Figure 6.1).



Table 6.2 Distribution of blood pressure categories defined by the measurements and medical history, Turkey 2011.

Distribution of blood pressure categories defined by measurements and medical history	n	%
Normotensive, no known diagnosis, not using medication	12533	76,3
Hypertensive, no known diagnosis, not using medication ^a	1450	8,8
Hypertension diagnosed, using medication, normotensive ^{*,b}	1167	7,1
Hypertension diagnosed, using medication, hypertensive ^{**,c}	1083	6,6
Hypertension diagnosed, not using medication, hypertensive ^d	197	1,2
Total	16430	100,0

* Hypertension Controlled,

** Hypertension not controlled

^{a, d} Without treatment ^{a, b, c, d} Hypertensive group (%23,7)

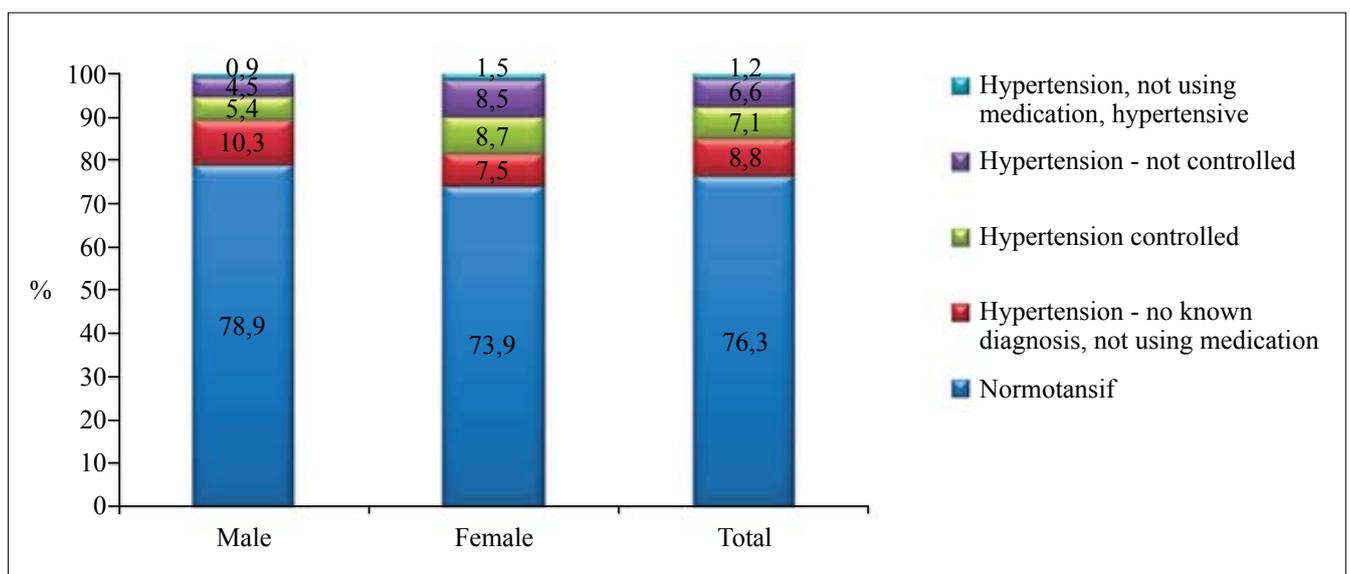


Figure 6.1 Distribution of blood pressure categories defined by the results obtained in the measurements and medical history, Turkey 2011.

Hypertension Prevalence By Sex and Age

The prevalence of hypertension is 24%. This rate is 21% in males and 26% in females. TURKSTAT 2010 population standardized Hypertension prevalence is 22%; 19% for males and 25% females (Table 6.3),(Figure 6.2).

Hypertension prevalence increases in both males and females with age. While hypertension prevalence for 15-24 age group is 3%, it increases to 14% for 34-44 age group; almost one of two people in 55-64 age group is hypertensive (53%). Hypertension prevalence in geriatric population (≥ 65 years) is 68% (59% for males, and 76% for females) (Table 6.3) (Figure 6.3).



Table 6.3 Hypertension prevalence by age, NUTS1 Regions and area of residence in male and female, Turkey 2011.

	Sex					
	Male		Female		Total	
Age Groups	n	%	n	%	n	%
15-24	70	4,5	34	2,0	104	3,2
25-34	101	6,1	80	4,4	181	5,2
35-44	224	14,6	233	14,0	457	14,3
45-54	362	28,0	560	37,3	922	33,0
55-64	412	43,6	615	62,1	1028	53,1
65-74	302	58,4	422	75,1	724	67,1
75+	178	60,3	304	77,6	482	70,3
NUTS1 Regions						
İstanbul	324	22,3	405	24,9	729	23,7
Western Marmara	117	30,3	160	40,0	277	35,2
Aegean	199	19,6	334	27,1	534	23,7
Eastern Marmara	160	20,4	233	27,6	394	24,2
Western Anatolia	147	21,0	198	22,3	345	21,7
Mediterranean	201	19,9	228	21,5	428	20,7
Central Anatolia	86	21,4	142	29,9	227	25,9
Western Black Sea	128	26,0	189	34,7	317	30,6
Eastern Black Sea	84	29,9	100	32,7	185	31,5
North Eastern Anatolia	51	22,7	57	26,4	108	24,5
Middle Eastern Anatolia	60	15,5	71	21,3	131	18,2
South Eastern Anatolia	90	13,4	132	19,0	222	16,3
Area of residence						
Rural	503	21,4	745	30,7	1248	26,2
Urban	1118	20,9	1460	24,1	2579	22,6
Total	1647	21,1	2249	26,1	3896	23,7
(95% CI)		(20,2-22,0)		(25,2-27,0)		(23,3-24,0)
Total*		19,1		24,6		21,8

* Standardized using Turkey 2010 population

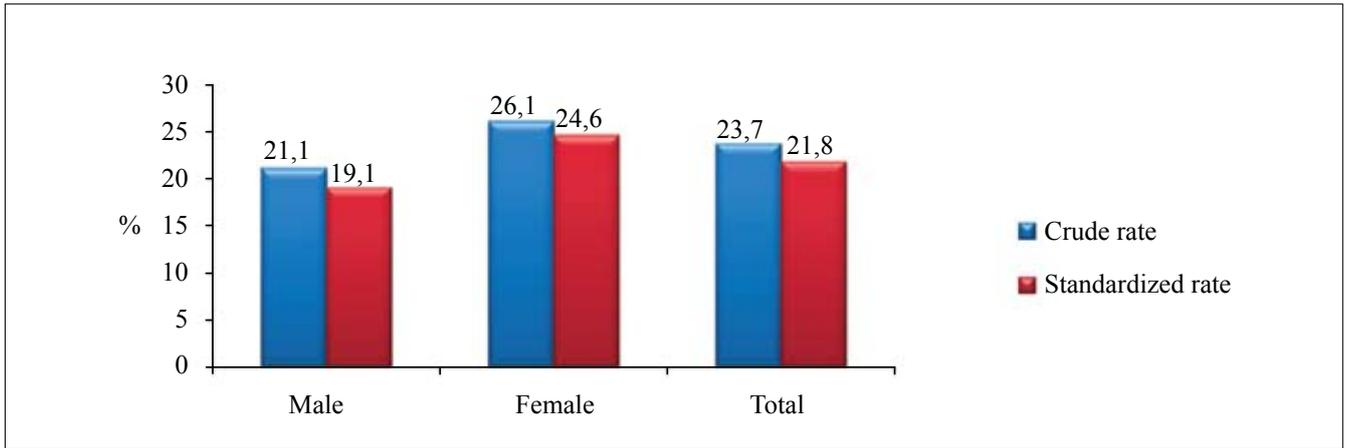


Figure 6.2 Crude and standardized hypertension prevalence, Turkey 2011.

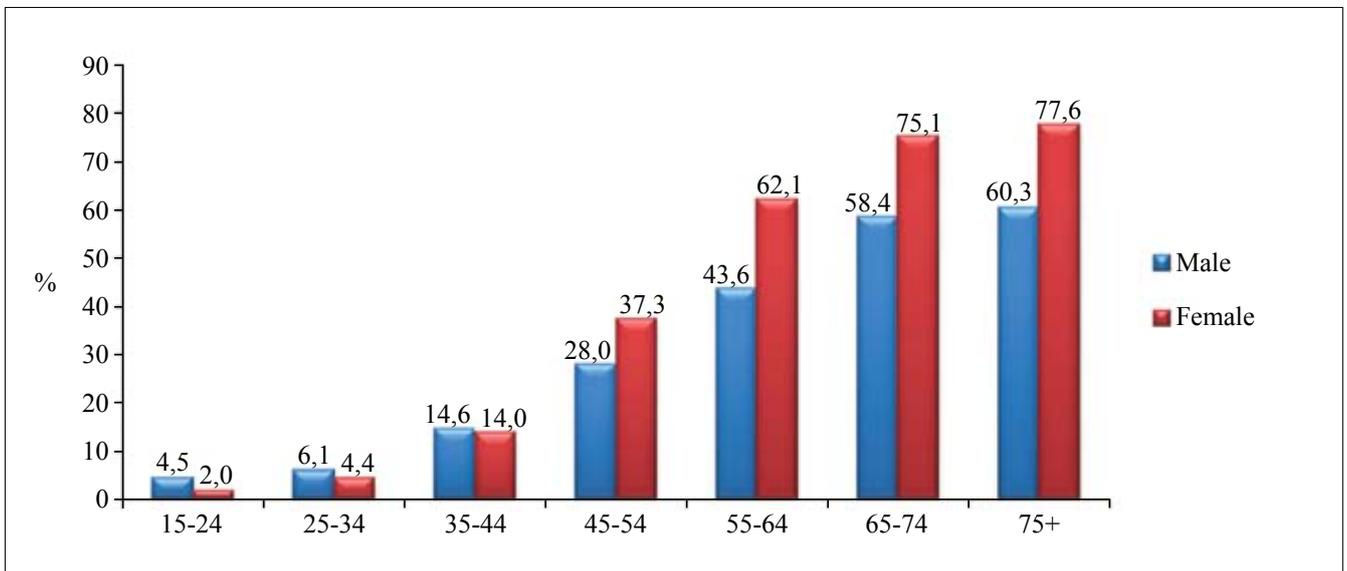


Figure 6.3 Hypertension prevalence by sex and age groups, Turkey 2011.

Hypertension prevalence is higher in females than males in each age group starting from 45-54 age group (Table 6.3). The prevalence in people living in rural areas is higher (26%) than the ones living in urban areas (22%). As it is so in general population, both in rural and in urban areas, hypertension prevalence is higher in females than in males (Table 6.3, Figure 6.4).

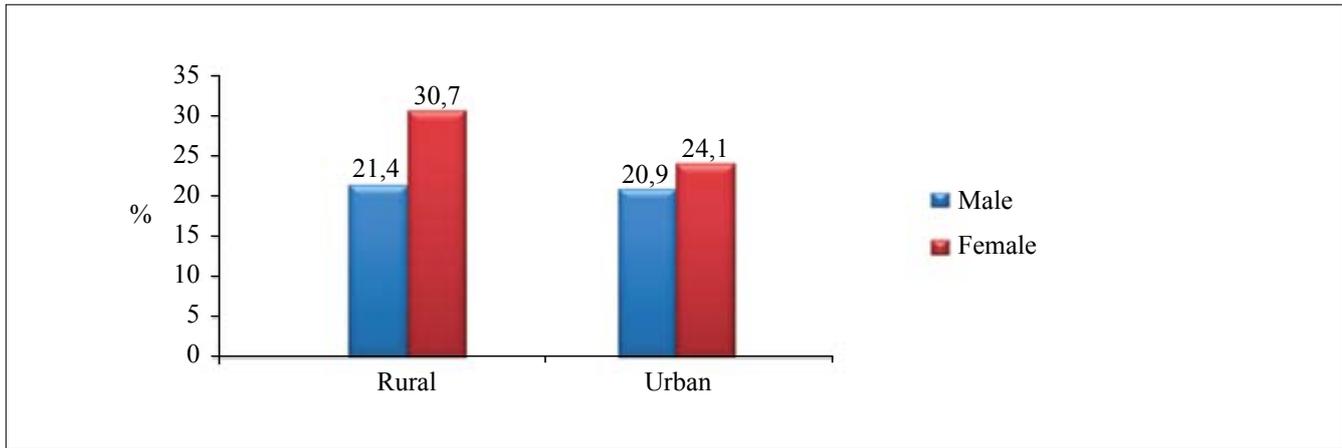


Figure 6.4 Hypertension prevalence by sex and area of residence, Turkey 2011.

Hypertension Prevalence By NUTS1 Region

Hypertension prevalence varies between 16% (South-eastern Anatolia) and 35% (Western Marmara) by NUTS1 regions. Hypertension prevalence is higher in females than in males in each of the 12 geographical regions (Figure 6.5).

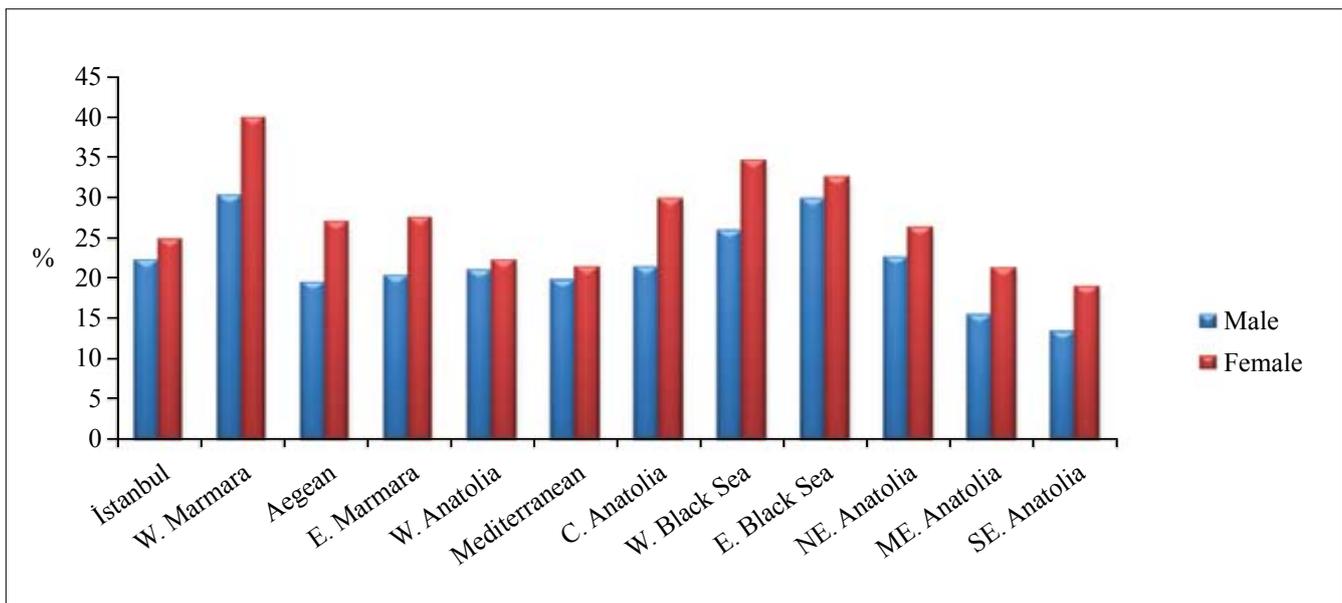


Figure 6.5 Hypertension prevalence by sex and NUTS1 regions, Turkey 2011

Isolated systolic hypertension (systolic BP \geq 140 mmHg, diastolic BP < 90 mmHG) prevalence is 6%. Isolated systolic hypertension prevalence increases with age, and the prevalence reaches to 22% in 65-and-above age group. Isolated diastolic hypertension is 3.9% (approximately 4% in both males and females).



Hypertension Diagnosis, Treatment and Control Rates

In total 17% of the participants (3059 individuals) declared that they had hypertension based on physician diagnosis, 85% of these participants were currently using medication for this diagnosis, and 63% of the one who are on medication have got chronic disease prescriptions. Hypertension awareness rate is 48% in general; 36% in males and 58% in females.

Treatment and Control Rates in Hypertensive Group

Only 30% of the people with hypertensive had blood pressures under control. 42% of the patients do not use any medication although they have been diagnosed with hypertension; namely without treatment. 28% of the patients using medication have their blood pressure not controlled. In females with hypertension, the rates for the ones not using medications, the ones with controlled blood pressure and the ones with not-controlled blood pressure are nearly the same (34%, 33% and 32% respectively). On the other hand, more than half of males (53.0%) are not receiving treatment currently; the rate for the ones with controlled hypertension is 25% (Table 6.4.), (Figure 6.6).



Table 6.4 Treatment and control rates for hypertensive individuals by sex, age groups, area of residence and NUTS1 regions, Turkey 2011.

	Not controlled		Without treatment		Controlled		Total	
	n	%	n	%	n	%	n	%
Sex								
Male	355	21,5	874	53,0	419	25,4	1648	100,0
Female	729	32,4	773	34,4	748	33,2	2250	100,0
Age Groups								
15-24	2	1,9	98	94,2	4	3,8	104	100,0
25-34	10	5,5	153	84,5	18	9,9	181	100,0
35-44	56	12,3	308	67,4	93	20,4	457	100,0
45-54	203	22,0	431	46,7	288	31,2	922	100,0
55-64	347	33,8	320	31,1	361	35,1	1028	100,0
65-74	282	39,0	195	26,9	247	34,1	724	100,0
75+	185	38,3	142	29,4	156	32,3	483	100,0
NUTS1 regions								
İstanbul	188	25,8	323	44,3	218	29,9	729	100,0
Western Marmara	83	30,0	120	43,3	74	26,7	277	100,0
Aegean	151	28,3	210	39,4	172	32,3	533	100,0
Eastern Marmara	116	29,4	160	40,6	118	29,9	394	100,0
Western Anatolia	95	27,6	124	36,0	125	36,3	344	100,0
Mediterranean	113	26,4	191	44,6	124	29,0	428	100,0
Central Anatolia	64	28,1	97	42,5	67	29,4	228	100,0
Western Black Sea	88	27,8	124	39,1	105	33,1	317	100,0
Eastern Black Sea	61	33,2	70	38,	53	28,8	184	100,0
North Eastern Anatolia	34	31,	56	51,4	19	17,4	109	100,0
Middle Eastern Anatolia	35	26,5	64	48,5	33	25,0	132	100,0
South Eastern Anatolia	55	24,7	108	48,4	60	26,9	223	100,0
Area of residence								
Rural	379	30,4	555	44,5	314	25,2	1248	100,0
Urban	689	26,7	1056	40,9	834	32,3	2579	100,0
Total	1083	27,8	1647	42,3	1167	29,9	3898	100,0

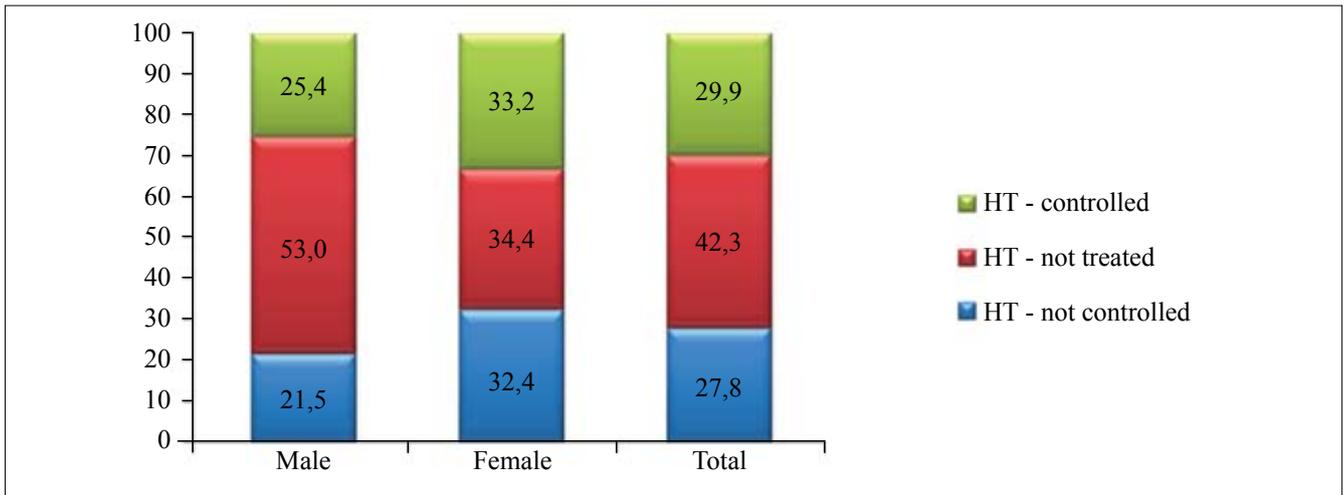


Figure 6.6 Treatment and control rates for hypertensive individuals by sex, Turkey 2011.

Among the hypertensive group, the proportion of individuals without treatment in rural areas is higher than in urban areas (44% for rural and 41% for urban areas). The proportion of controlled hypertension is lower in individuals in rural areas than the ones in urban areas (25% for rural areas, and 32% for urban areas) (Figure 6.7)(Table 6.4).

When NUTS1 regions are evaluated, the rate for hypertensive people without treatment is highest in North-Eastern Anatolia region (51%). The highest rate for controlled hypertension is Western Anatolia with 36%. On the other hand, the rate for uncontrolled hypertension is highest in Eastern Black Sea with 33% and North-eastern Anatolia with 31% (Table 6.4) (Figure 6.7).

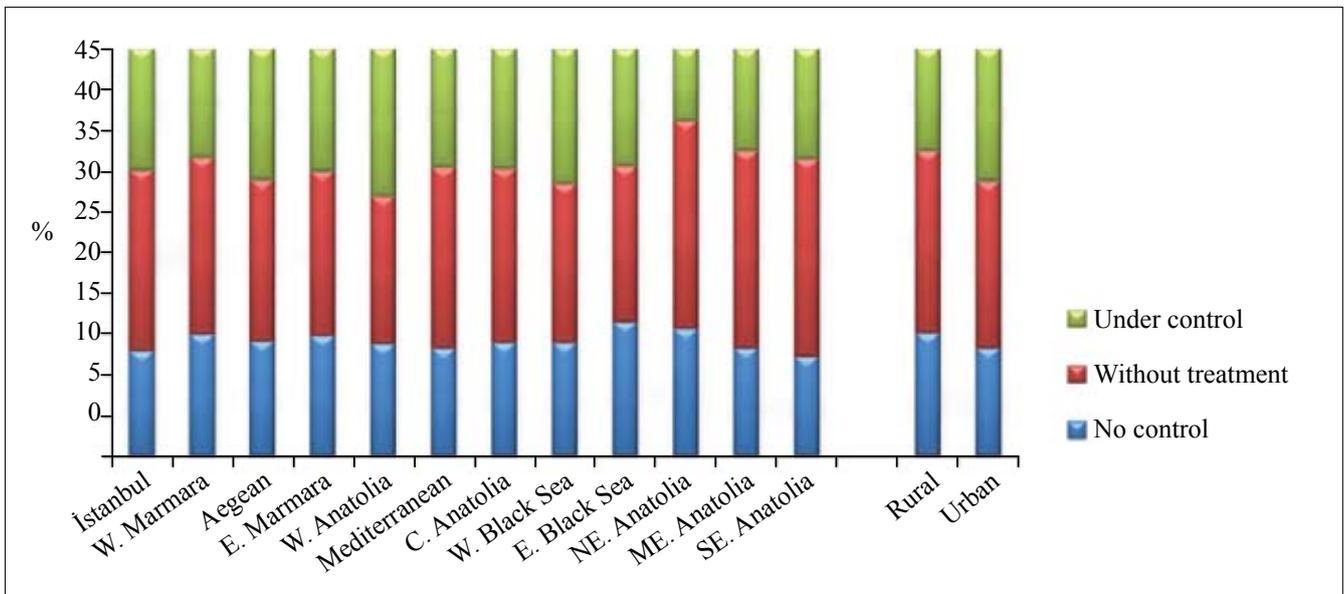


Figure 6.7 Treatment and control for hypertensive individuals by NUTS1 regions and area of residence, Turkey 2011.



Hypertension Treatment-Control Rates in the Study Population

In this section, hypertension treatment-control rates were presented in the total study group.

The percentage of hypertensive males who are not on medication is 11%, and it is also seen that the rate for without treatment group increases in the hypertensive population as the age group increases: 17% of males in 45-54 age group, 19% of 55-64 age group, 19% of 65-74 age group, and 21% of the 75-and-above group do not use medication although they are hypertensive (Table 6.5) (Figure 6.8).

Table 6.5 Blood pressure categories by age groups, NUTS regions and area of residence in males, Turkey 2011.

	Normal blood Pressure		HT-not controlled		HT-without treatment		HT-controlled	
	n	%	n	%	n	%	n	%
Age Groups								
15-24	1490	95,5	2	0,1	67	4,3	1	0,1
25-34	1562	94,0	5	0,3	89	5,4	6	0,4
35-44	1312	85,4	23	1,5	161	10,5	40	2,6
45-54	931	72,1	63	4,9	215	16,6	83	6,0
55-64	534	56,4	107	11,3	179	18,9	127	13,4
65-74	215	41,6	105	20,3	100	19,3	97	18,8
75+	117	39,8	49	16,7	62	21,1	66	22,4
NUTS1 regions								
İstanbul	1131	77,7	63	4,3	177	12,2	84	5,8
Western Marmara	269	69,9	30	7,8	63	16,4	23	6,0
Aegean	818	80,4	42	4,1	108	10,6	50	4,9
Eastern Marmara	623	79,6	34	4,3	75	9,6	51	6,5
Western Anatolia	552	79,0	38	5,4	69	9,9	40	5,7
Mediterranean	809	80,2	39	3,9	109	10,8	52	5,2
Central Anatolia	315	78,6	15	3,7	49	12,2	22	5,5
Western Black Sea	364	74,1	26	5,3	63	12,8	38	7,7
Eastern Black Sea	197	70,1	27	9,6	37	13,2	20	7,1
North Eastern Anatolia	174	77,3	10	4,4	34	15,1	7	3,1
Middle Eastern Anatolia	327	84,5	21	5,4	31	8,	8	2,1
South Eastern Anatolia	581	86,5	8	1,2	58	8,6	25	3,7
Area of residence								
Rural	1845	78,6	112	4,8	282	12,0	109	4,6
Urban	4221	79,1	239	4,5	574	10,8	305	5,7
Total	6160	78,9	355	4,5	874	11,2	419	5,4

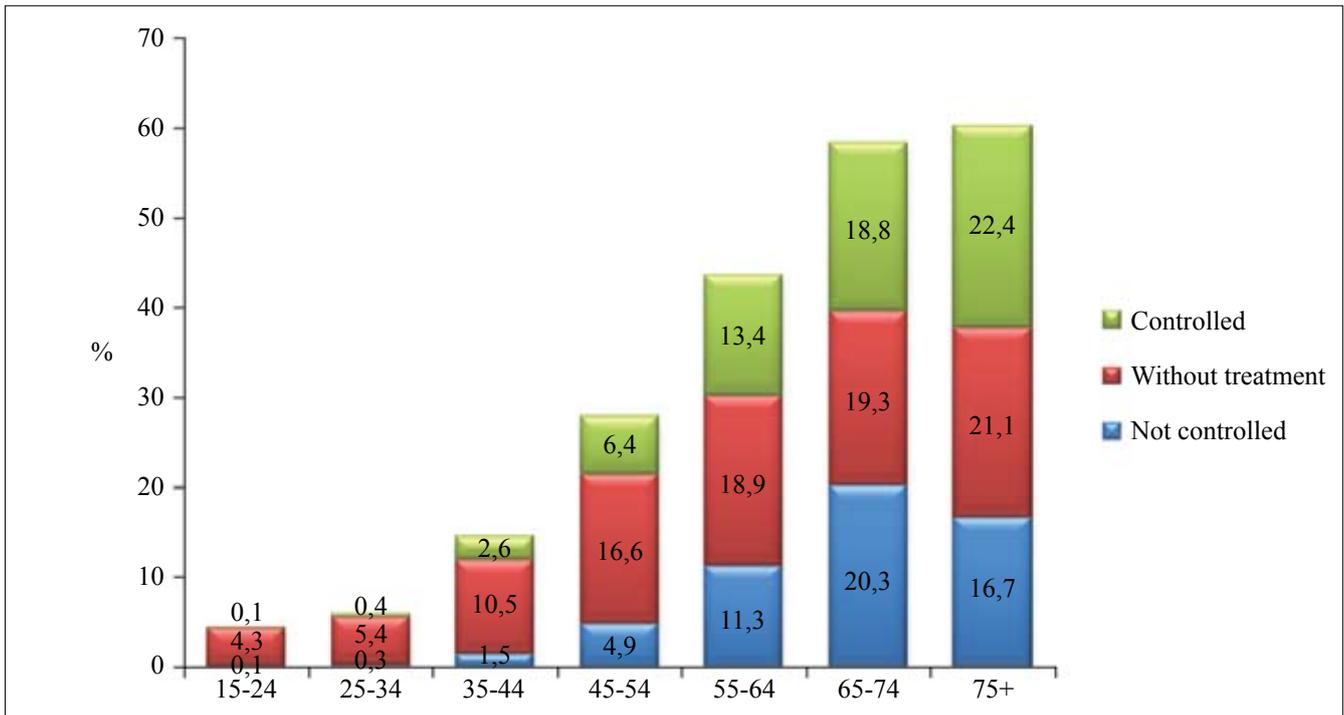


Figure 6.8 Hypertension prevalence and control-treatment rates for males by age groups, Turkey 2011.

In females the rate for individuals without controlled blood pressure increases in the hypertensive group which also increases with age. In general, the rate for the non controlled hypertension in females is 8%; however this rate increases to 9% in 45-54 age group, 24% in 55-64 age group, and reaches to 34% in 75 and over age group. (Table 6.6) (Figure 6.9).



Table 6.6 Blood Pressure categories by age groups, NUTS regions and area of residence in females, Turkey 2011.

Age Groups	Normal blood Pressure		HT-not controlled		HT-without treatment		HT-controlled	
	n	%	n	%	n	%	n	%
15-24	1665	97,9	-	-	31	1,8	4	0,2
25-34	1731	95,6	5	0,3	63	3,5	12	0,7
35-44	1433	86,1	32	1,9	147	8,8	53	3,2
45-54	941	62,6	140	9,3	216	14,4	205	13,6
55-64	375	37,8	240	24,2	142	14,3	234	23,6
65-74	140	24,9	177	31,5	95	16,9	150	26,7
75+	88	22,4	135	34,4	80	20,4	89	22,7
NUTS1 regions								
İstanbul	1222	75,1	125	7,7	146	9,0	134	8,2
Western Marmara	240	59,9	53	13,2	57	14,2	51	12,7
Aegean	897	72,9	110	8,9	102	8,3	122	9,9
Eastern Marmara	612	72,3	82	9,7	85	10,0	67	7,9
Western Anatolia	690	77,7	57	6,4	56	6,3	85	9,6
Mediterranean	832	78,5	74	7,0	82	7,7	72	6,8
Central Anatolia	333	70,1	49	10,3	48	10,1	45	9,5
Western Black Sea	356	65,3	62	11,4	61	11,2	66	12,1
Eastern Black Sea	206	67,3	34	11,1	33	10,8	33	10,8
North Eastern Anatolia	160	74,1	23	10,6	21	9,7	12	5,6
Middle Eastern Anatolia	262	78,7	14	4,2	32	9,6	25	7,5
South Eastern Anatolia	563	81,1	46	6,6	50	7,2	35	5,0
Area of residence								
Rural	1678	69,3	268	11,1	273	11,3	204	8,4
Urban	4591	75,9	450	7,4	482	8,0	529	8,7
Total	6372	73,9	729	8,4	773	9,0	748	8,7

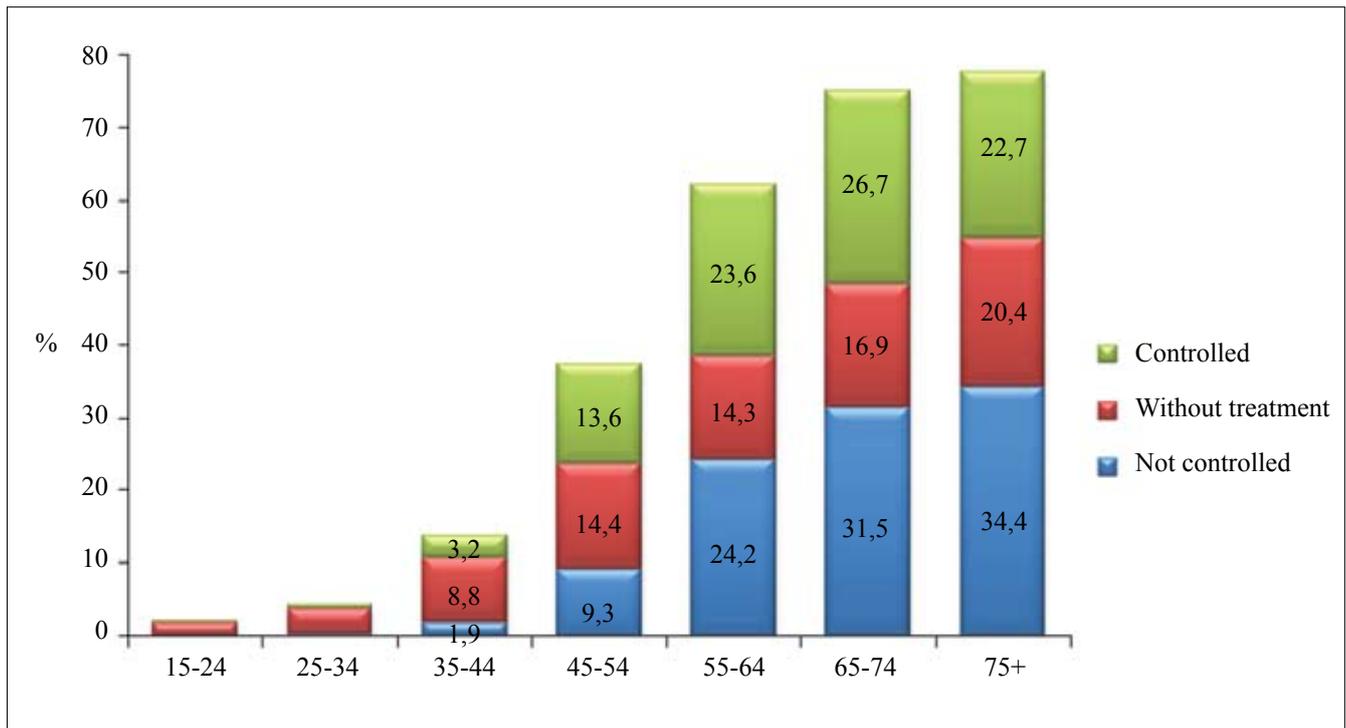


Figure 6.9 Hypertension prevalence and control-treatment rates for females by age groups, Turkey 2011.

6.4 Discussion

In this study, the prevalence for hypertension in individuals of 15 years of age was found as 24%, with regard to hypertension history, medication status, and systolic-diastolic blood pressure values. Prevalence in females is 26%, and 24% in males. In the TEKHARF study in 1990, the high blood pressure frequency in Turkey was found 38% in females and 28% in males (3). In the TURDEP-I study conducted in 1998, hypertension prevalence in the individuals who are above 20 years of age was found 29% (7), and it was found as 32% in the Turkish Hypertension Prevalence Study (PatenT) conducted in 2003 among individuals who are 18 years of age and above (1). In this study, if the age group is taken as 20 and above as in TURDEP-I; hypertension prevalence would be 26 %, if the age group is taken as 18 and above as in PatenT, prevalence would be 25%.

According to the preliminary results of the TURDEP-II in 2010 hypertension prevalence rate is 31% and the difference between males-females and rural areas-urban areas disappeared (5) (Table 6.7).



Table 6.7 Three previous HT prevalence studies conducted between 1998 and 2011 in Turkey, and comparative results.

	TURDEP I	Turkish Hypertension Prevalence Study (PatenT)	TURDEP II	Chronic Diseases and Risk Factors Study
Age group	20-and-above	18 and above	20-and-above	15-and-above
Year	1998	2003	2010	2011
HT definition	History+BP measurement	History+BP measurement	History+BP measurement	History+BP measurement
Prevalence (Crude)	29%	32%	31%	24%
Comparative results				25%* 26%**

* Considering PatenT age group,

** Considering TURDEP age group

In this study, hypertension prevalence increases with age just as in the previous studies; hypertension prevalence for 34-44 age group is 14%, in 45-54 age group one of three people has hypertension. In the Turkish Hypertension Prevalence study, hypertension prevalence in geriatric population (≥ 65) was found 75% (67% for males, and 82% for females) (1). In this study, however, hypertension prevalence for the same age group is 68% (59% for males, and 76% for females).

It has been shown, in almost all of the previous studies, that hypertension is more frequent in females (1, 2). Similarly, this study, too, found that hypertension rate is higher in females than males in country general, in both rural and urban areas and also in each of the twelve NUTS1 regions. Again, starting from 45-54 age group, in each age group, prevalence in females is higher than males. It is thought that the reason for this high hypertension prevalence in females is obesity. Hypertension prevalence of the people living in rural areas was found higher than the ones in urban areas. In the Turkish Hypertension Prevalence study any difference between urban (31%) and rural (33%) areas was not found. However, it was reported that there were statistically meaningful differences between geographical regions; the region with highest hypertension prevalence was Central Anatolia (38.5%) and the lowest was Eastern Anatolia (25%) (1). In this study, however, these regions are defined as NUTS1 regions and the lowest prevalence is in South-eastern Anatolia (16%) and the highest is in Western Marmara (35%).

According to the Turkish Hypertension Prevalence study, the rate for hypertension awareness was 41% and this rate was higher in females than in males (48% vs. 28%) (1). In this study, however, hypertension awareness rate is found 48%; similarly awareness in females is higher than males (58% vs. 36%). According to the results of TURDEP-II, hypertension awareness rate was 58%, and again the rate was higher in females than males (68% vs. 48%) (5). According to the study conducted in Kocaeli in 2009, hypertension awareness rate was 59% (8), is higher than the results of a previous study which had been



conducted in the same region 10 years ago (49% awareness rate in the previous study) (9).

In this study, the ratio of the patients who have hypertension but not using medication due to hypertension/ or patients without treatment is 42%. The rate for without treatment group is higher in males significantly. In males, the rate for without treatment group increases as hypertension prevalence increases with age.

In this study, the rate for controlled blood pressure is found 7% in the study population. The same rate was 8% in PatenT study, 9% in Kocaeli study (1, 8).

According to the results of the study, only 30% of the hypertensive participants' blood pressures are under control. The rate for not-controlled hypertension is higher in females than males (32% for females, and 21% for males). In the Turkish Hypertension Prevalence study, the rate for controlled hypertension was found 21%; similarly this rate is higher in males than females (31% in males and 17,4%in females) (1).

In conclusion, hypertension seems to be a significant chronic health condition and risk factor for our country with its 24% prevalence rate. Hypertension increases with age, and is higher in rural and in females. Although there is an increase in hypertension awareness, compared to the previous years, unawareness is still high. Almost one third of the individuals in the hypertensive group have not-controlled blood pressure; being not-controlled in females and unawareness in males are seen as significant issues.



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7

Diabetes





7 Diabetes

Professor Sibel KALAÇA

Key Findings

- This section presents the diabetes prevalence in individuals above 15 years of age. Awareness, treatment and control rates were also evaluated bysex, age groups, area of residence and NUTS1 regions.
- 28% of the participants stated that at least one person had diabetes in their families.
- The rate for the individuals who stated that they had diabetes is approximately 8%, this rate is slightly higher in females (9%) than males (7%).
- Approximately 84% of the individuals who mentioned diabetes diagnosis use regular medication.
- The diabetes awareness rate is 74% and it is lower in males (69%) than females (78%).
- 16% of the population is prediabetic, there is no difference between males and females.
- The prevalence of newly diagnosed diabetes is 3%. According to the diabetes diagnosis which was determined using diabetes and medication history, and fasting plasma glucose measurement, diabetes prevalence in the 15-and-above age group is 11% (95% CI 10,6-11,6). There are not any differences between males and females; and between rural areas and urban areas.
- Diabetes prevalence increases with age, both in males and females.
- In terms of NUTS1 regions, diabetes prevalence varies between 9% (Eastern Central Anatolia region) and 14% (Western Marmara and Western Anatolia regions).
- The percentage of individuals with controlled diabetes is 29%, with uncontrolled diabetes is 40%, and the rate for individuals who has diabetes but are not receiving any treatment is 31%.
- The rate for uncontrolled diabetes is higher in females (41%) than males (38%); however, the rate for individuals who do not receive any treatment is higher in males (36%) than females (30%).



7.1 Introduction

With the rapid change in life style, diabetes, especially type II diabetes prevalence is gradually increasing in developed and developing countries. While the population with diabetes around the world is 285 millions, by the end of 2009, this number is expected to reach 438 millions, by 2030 (1). The main reasons for this are population increase, aging and the increased obesity and physical inactivity caused by changing life style as a result of urbanization. According to estimations, diabetes prevalence in the adult population (20-79 age group) in Europe is 8.5% by 2010, and it is estimated that this rate would be 10% in 2030, with a 18% increase (1). In other words, the current diabetes population in Europe, which is 55 million, is expected to exceed 66 million in 20 years. According to the results of the “Turkey Diabetes Epidemiology Study” (TURDEP-I), conducted between 1997 and 1998 in 270 villages and 270 district centres, on randomly selected 24,788 individuals who were 20 years of age, type II diabetes prevalence in Turkey is 7.2%, and the impaired glucose tolerance (IGT) prevalence is 6.7% (2). Depending on these rates, and according to the 2007 population data by Turkish Statistical Institute (TURKSTAT), it was calculated that there were over 2.85 million individuals with type II diabetes and around 2.6 million with impaired glucose tolerance (IGT). According to the data published in 2009, which are related to the cohort of TEKHARF study which had been monitored since the 1997/98 screening to 2004/05, diabetes prevalence in 35-and-above population in Turkey was estimated 11%, and it was calculated that this ratio equalled to a 3.3 million individuals (3). According to the results of TURDEP II study, which is a repetition of TURDEP I study, conducted in 2010 in the same regions and the same age group, with the same method, diabetes prevalence in Turkey is 16.5% and there are 6.5 million individuals with diabetes. When this new study is compared to the 1998 TURDEP-I study, it is seen that diabetes and impaired glucose tolerance prevalence in Turkey had increased by 90% and 207% respectively (4). These results show that the rates are very close to the rates estimated for the next 20 years. The speed of increase of diabetes in Turkey is over the world and Europe in general (1,5-6). It is the same for IGT. The main reasons for these findings are the aging population in Turkey foremost, and the changes in life style as diet and physical activity. The present condition indicates that diabetes control is of utmost importance and an urgent requirement for Turkey (7).

This section presents the current condition of diabetes in Turkey, by evaluating diabetes and impaired glucose tolerance prevalence in the population above 15 years of age. At the same time, diagnosis, treatment and control rates for the disease are discussed bysex, age groups, area of residence and NUTS1 regions.

7.2 Methods and Definitions

Diabetes History

The presence of family history for diabetes was evaluated by asking the participants the question “Does anybody in your family have diabetes?” and participants who stated diabetes history for any family members (mother, father, siblings or children) were considered as “having family history for diabetes”.

Diabetes history, on the other hand, was evaluated by asking “Have you been diagnosed with diabetes by



a physician?" To the participants who stated diabetes based on physician diagnosis were asked questions about regular medication, chronic disease reports and the medications used.

Measurements

The fasting plasma glucose levels (FPG) were evaluated with the glucose oxidase method in the venous blood sample taken after at least 8 hours of night fasting. The number of individuals whose FPG levels were evaluated is 15083.

Diabetes Definition

Diabetes diagnosis in this study was done based on diabetes history, use of medication, and FPG measurement. The FPG levels were accepted 126mg/dl for diabetes and 100-125 mg/dl for impaired fasting glucose (8).

The following categories were defined with regard to these criteria:

- **Known diabetes:** individuals with diabetes history and using medication; individuals with diabetes history, not using medication and with FPG >125 mg/dl
- **New Diabetes:** individuals without diabetes history and with FPG > 125 mg/dl
- **Impaired fasting glucose (IFG):** individuals without diabetes history and with FPG between 100 and 125 mg/dl

Diabetes awareness was defined as the ratio of known diabetes to the total number of diabetes (4).

Treatment and Control Definitions

Individuals were grouped into four categories with regard to their FPG levels and use of medication due to diabetes:

Normal FPG levels-No DM diagnosis, not receiving treatment: FPG < 126 mg/dl and without diabetes diagnosis, not using medication

- **DM-controlled:** FPG < 126 mg/dl, currently using medication due to diabetes
- **DM-uncontrolled:** FPG > 125 mg/dl, currently using medication due to diabetes
- **DM-untreated:** FPG > 125 mg/dl, currently not using medication due to diabetes



7.3 Findings

Diabetes History, Medications and Treatments Used

In total 28% of the participants stated that at least one person in their family had diabetes; this rate is higher in females (31%) than males (26%). The rate of the individuals who stated they had diabetes is 8%, again this rate is slightly higher in females (9%) than males (7%). Approximately 84% of the participants who stated diabetes diagnosis use medication regularly. 69% of the ones using medication have a chronic disease report. When the medications used and treatments are evaluated, it is seen that 66% of the participants were on diet, 78% of them used oral anti-diabetics, 19% of them used insulin, and 2% used herbal medication (Table 7.1).

Table 7.1 Family history and medication, Turkey 2011

	Male		Female		Total	
	Number	%	Number	%	Number	%
Participants who declared family history	2262	25,8	3020	31,1	5282	28,6
Participants who declared DM diagnosis	588	6,8	830	8,7	1418	7,8
Regular medication in participants who declared DM diagnosis	489	86,2	658	82,0	1147	83,8
Participants with chronic disease report	408	71,8	533	66,5	941	68,7
Medications used in participants who declared DM diagnosis						
Diet	371	63,1	558	67,2	929	65,5
Oral anti-diabetic	445	75,6	658	79,3	1103	77,7
Insulin	143	24,3	132	15,9	275	19,4
Herbal medicines	11	1,8	12	1,4	23	1,6

Diabetes awareness is 74% and this rate is highest in Western Anatolia with 92%, and the lowest in North-eastern Anatolia with 53%. Diabetes awareness is lower in males (69%) than females (78%).

Diabetes (DM) History and Fasting Plasma Glucose (FPG) Findings

According to the diabetes history and FPG results obtained from the participants, 73% had normal FPG levels and no history of diabetes. This rate is very similar in males and females. The known diabetes prevalence is 8%, 7% in males and 9% in females. When the IFG rates are considered, it is seen that 16% of the population have IFG; there is not any difference between males and females. The rate for individuals who were evaluated as new diabetes, with no diabetes history and with FPG > 125 mg/dl, is 3%. New diabetes prevalence is slightly higher in males (3%) than females (2%) (Table 7.2.) (Figure 7.1).



Table 7.2 DM history and FPG results by sex, Turkey 2011.

	Male			Female			Total		
	n	%	% 95 GA	n	%	% 95 GA	n	%	% 95 GA
Normal FPG- No DM history	5164	73,5	(72,5-74,5)	5795	72,7	(71,7-73,7)	10959	73,1	(72,4-73,8)
Known diabetes	525	7,5	(6,9-8,1)	709	8,9	(7,5-8,7)	1234	8,2	(7,8-8,6)
Impaired FPG	1103	15,7	(14,8-16,5)	1262	15,8	(15,0-16,6)	2364	15,8	(15,2-16,4)
New DM	235	3,3	(2,9-3,7)	200	2,5	(2,1-2,8)	434	2,9	(2,6-3,2)
Total	7027	100,0		7966	100,0		14992	100,0	

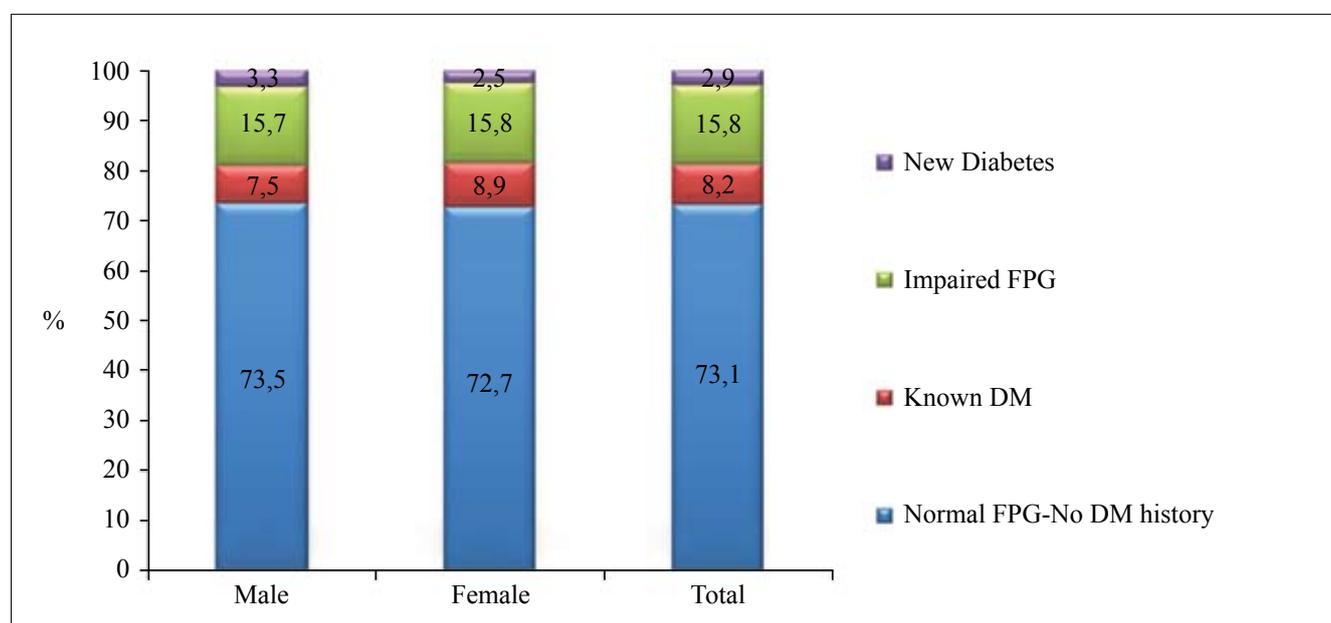


Figure 7.1 DM history and FPG results in research population by sex, Turkey 2011.

When evaluated with regard to age groups, it is seen that known diabetes rate, which is 4% for 35-44 age group, increased to 12% in 45-54 age group, and reached to 24% in 65-74 age group. 11% of individuals in 25-24% age group have impaired fasting glucose; the highest rate for IFG is 21% in 45-54 age group. When new diabetes rates are considered, the highest rate is seen in 65-and-above age group with 6% (Table 7.3), (Figure 7.2).



Table 7.3 DM history and FPG results by age groups, Turkey 2011.

Age groups	Normal FPG- No DM history		Known DM		Impaired FPG		New DM	
	n	%	n	%	n	%	n	%
15-24	2522	89,6	5	0,2	265	9,4	22	0,8
25-34	2660	86,5	28	0,9	349	11,3	37	1,2
35-44	2234	76,3	105	3,5	510	17,4	76	2,5
45-54	1683	63,6	306	11,5	551	20,8	105	3,9
55-64	1000	53,9	413	22,2	352	18,9	88	4,7
65-74	517	49,9	251	24,2	205	19,7	63	6,1
75+	343	53,2	127	19,7	133	20,6	42	6,5
Total	10959	73,1	1235	8,2	2365	15,8	433	2,9

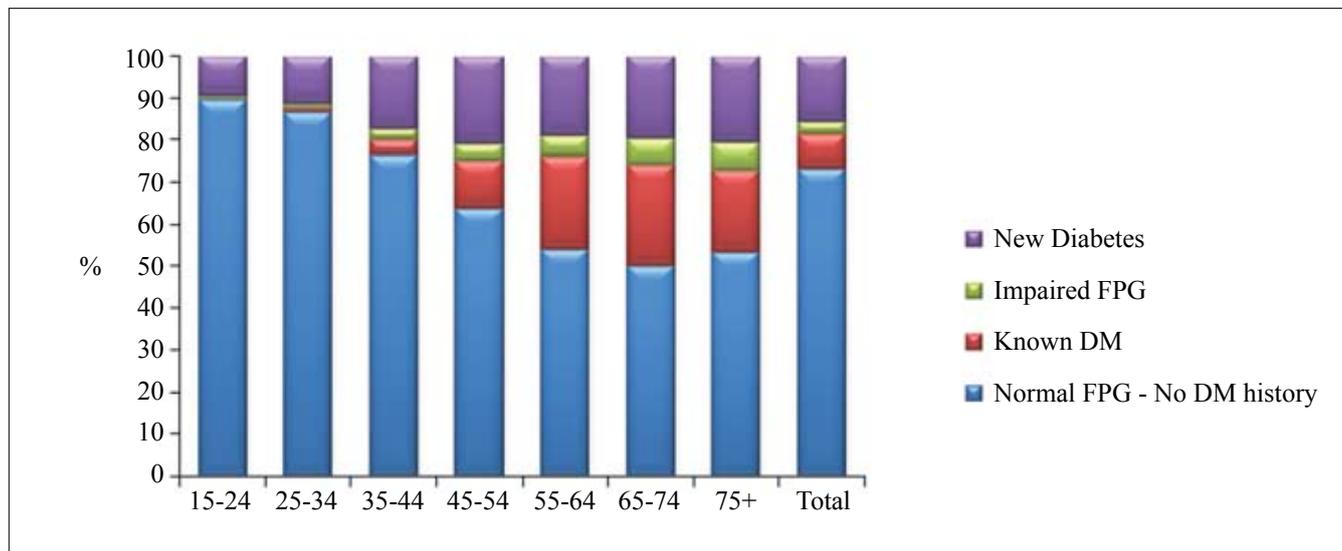


Figure 7.2 DM history and FPG results in research population by age groups, Turkey 2011.

When it is evaluated in terms of NUTS1 regions, the region with the highest diabetes prevalence is Western Marmara (10%). The region with the highest IFG level prevalence is İstanbul with 24% and Western Anatolia with 22%. Western Anatolia, North-eastern Anatolia and South-eastern Anatolia are the regions with the highest new diabetes prevalence, the prevalence in these regions are very close (4%, 5% and 4% respectively) (Table 7.4).



Table 7.4 DM history and FPG results by NUTS1 regions, Turkey 2011.

NUTS1 regions	Normal FPG- No DM history		Known DM		Impaired FPG		New DM	
	n	%	n	%	n	%	n	%
İstanbul	1798	64,9	224	8,1	672	24,3	77	2,8
Western Marmara	526	71,4	75	10,2	112	15,2	24	3,3
Aegean	1663	78,3	192	9,0	219	10,3	50	2,4
Eastern Marmara	1206	78,0	123	8,0	173	11,2	44	2,8
Western Anatolia	928	64,2	137	9,5	320	22,1	60	4,2
Mediterranean	1530	79,9	144	7,5	194	10,1	48	2,5
Central Anatolia	632	76,4	65	7,9	110	13,3	20	2,4
Western Black Sea	684	70,4	94	9,7	175	18,0	19	2,0
Eastern Black Sea	394	73,6	43	8,0	85	15,9	13	2,4
North Eastern Anatolia	280	71,8	23	5,9	69	17,7	18	4,6
Eastern Central Anatolia	472	76,9	40	6,5	87	14,2	15	2,4
South Eastern Anatolia	845	75,9	74	6,6	149	13,4	46	4,1
Total	10959	73,1	1235	8,2	2365	15,8	433	2,9

Diabetes Prevalence

According to the diabetes diagnosis, determined based on diabetes history, use of medication and fasting plasma glucose measurement, in the population above 15 years of age, diabetes prevalence in research population is 11% (%95 CI 10,6%-11,6%). The diabetes prevalence standardized according to the 2010 population of Turkey is 10%. There is not any difference between males and females; and between individuals living in rural areas and urban areas in terms of diabetes prevalence (Table 7.5) (Figure 7.3).



Table 7.5 DM prevalence by sex, age groups, area of residence and NUTS1 regions, Turkey 2011.

Age groups	Sex					
	Male		Female		Total	
	n	%	n	%	n	%
15-24	13	1,0	14	,9	27	1,0
25-34	38	2,7	27	1,6	65	2,1
35-44	88	6,4	94	6,0	182	6,2
45-54	192	15,8	219	15,3	411	15,5
55-64	226	24,6	275	29,4	501	27,0
65-74	132	27,0	182	33,2	314	30,3
75+	70	25,1	99	27,0	169	26,2
Area of residence						
Rural	213	10,1	281	12,9	494	11,5
Urban	538	11,2	610	10,8	1148	11,
NUTS1 regions						
İstanbul	143	11,1	159	10,7	302	10,9
Western Marmara	48	13,6	52	13,5	100	13,6
Aegean	103	10,8	139	11,9	242	11,4
Eastern Marmara	67	9,1	101	12,4	168	10,9
Western Anatolia	99	15,6	98	12,1	197	13,6
Mediterranean	96	10,5	95	9,5	191	10,0
Central Anatolia	38	9,9	46	10,4	85	10,3
Western Black Sea	44	9,6	69	13,4	114	11,7
Eastern Black Sea	31	11,9	25	9,1	56	10,5
North Eastern Anatolia	14	7,3	26	13,3	41	10,5
Eastern Central Anatolia	30	9,4	25	8,4	55	9,0
South Eastern Anatolia	45	8,4	74	12,8	119	10,7
Total*	760	10,8	909	11,4	1669	11,1
		(10,1-11,5)		(10,7-12,1)		(10,6-11,6)
Total**		9,3		10,5		9,9

* People with diabetes in males and females

** Standardized using Turkey 2010 population

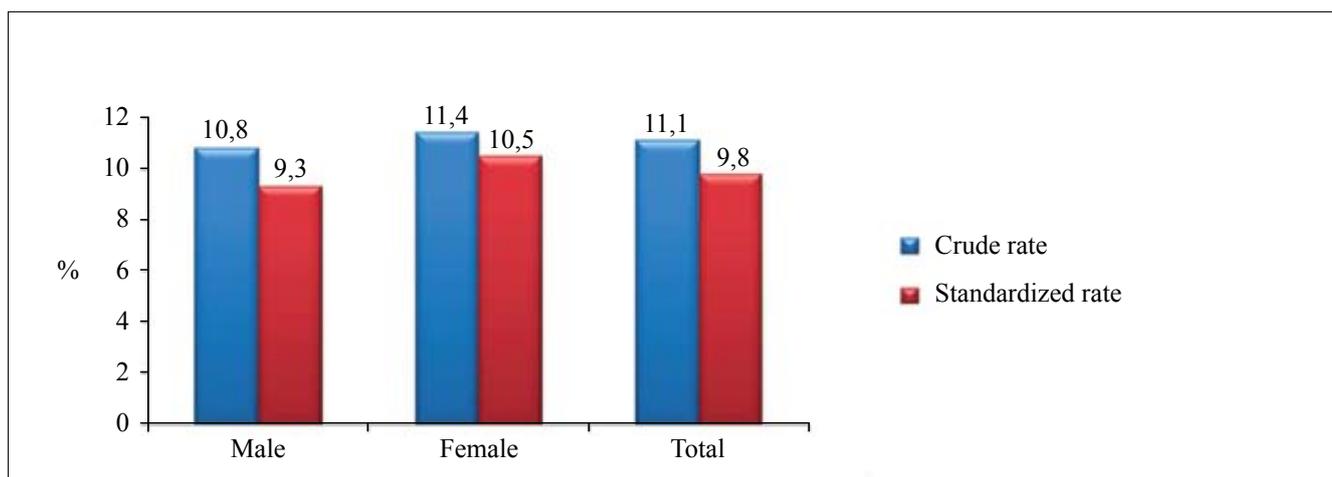


Figure 7.3 Crude and Standardized DM rates by sex, Turkey 2011

When evaluated with regard to NUTS1 regions, diabetes prevalence varies between 9% (Eastern Central Anatolia region) and 14% (Western Marmara and Western Anatolia regions) (Table 7.5) (Figure 7.5). In Western Anatolia and Eastern Black Sea regions diabetes prevalence is higher in males than females. On the other hand in Eastern Marmara, Western Black Sea, North-eastern and South-eastern Anatolia regions prevalence in females is higher than males.

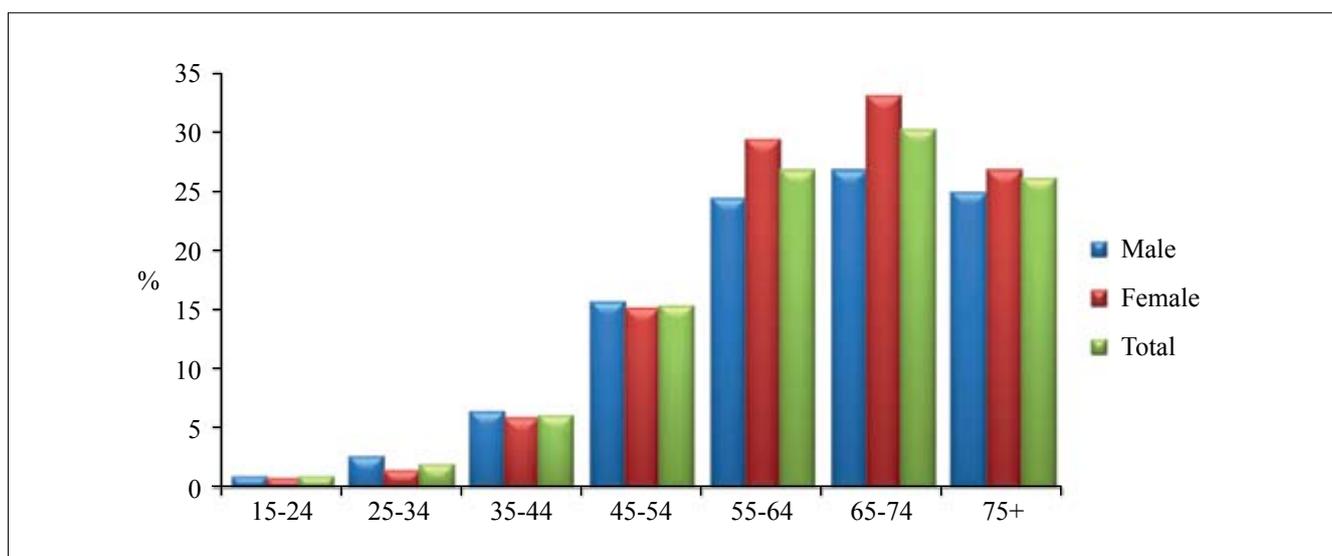


Figure 7.4 DM prevalence by sex and age groups, Turkey 2011

When evaluated with regard to NUTS1 regions, diabetes prevalence varies between 9% (Eastern Central Anatolia region) and 14% (Western Marmara and Western Anatolia regions) (Table 7.5) (Figure 7.5). In Western Anatolia and Eastern Black Sea regions diabetes prevalence is higher in males than females. On the other hand in Eastern Marmara, Western Black Sea, North-eastern and South-eastern Anatolia regions prevalence in females is higher than males.

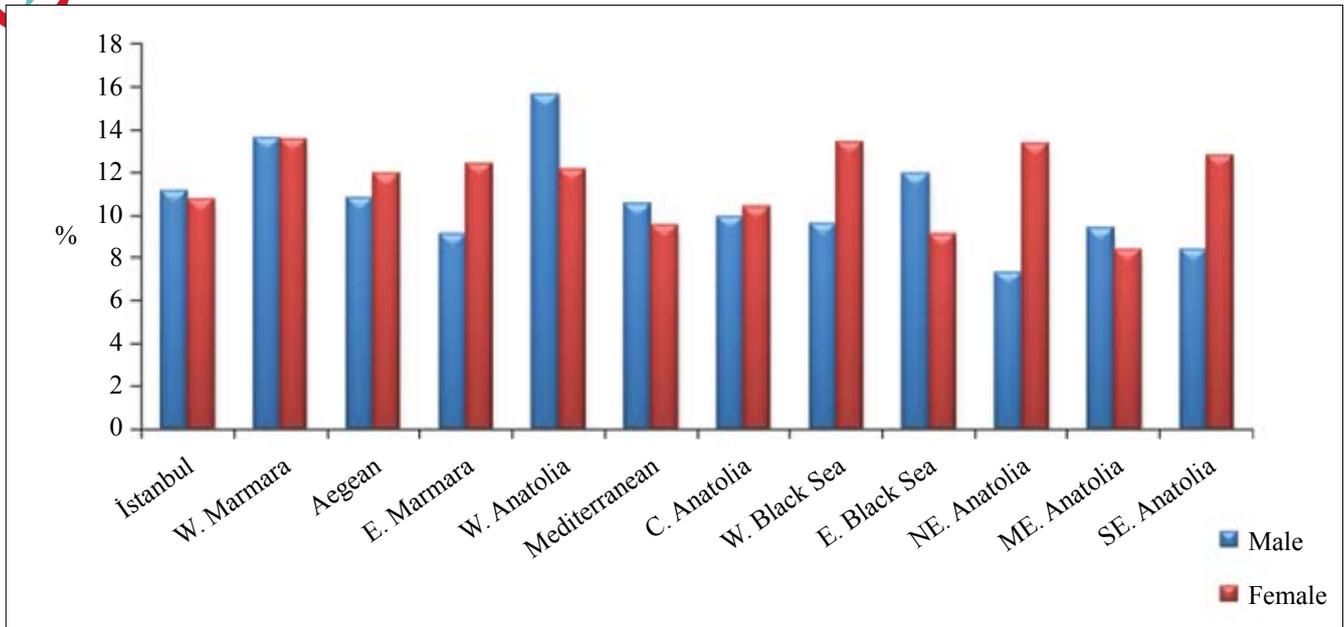


Figure 7.5 DM prevalence by sex and NUTS1 regions, Turkey 2011.

Treatment and Control Rates

When the individuals with untreated diabetes, controlled diabetes and uncontrolled diabetes are evaluated, it is seen that the distribution is approximately 1/3. The rate of individuals with controlled diabetes is 29%, uncontrolled diabetes is 40% and untreated diabetes is 31% (Figure 7.6). When these rates are evaluated in terms of sex, it is seen that the rate of uncontrolled diabetes in females (41%) is higher than males (38%); the rate of untreated diabetes is higher in males (36%) than females (26%).

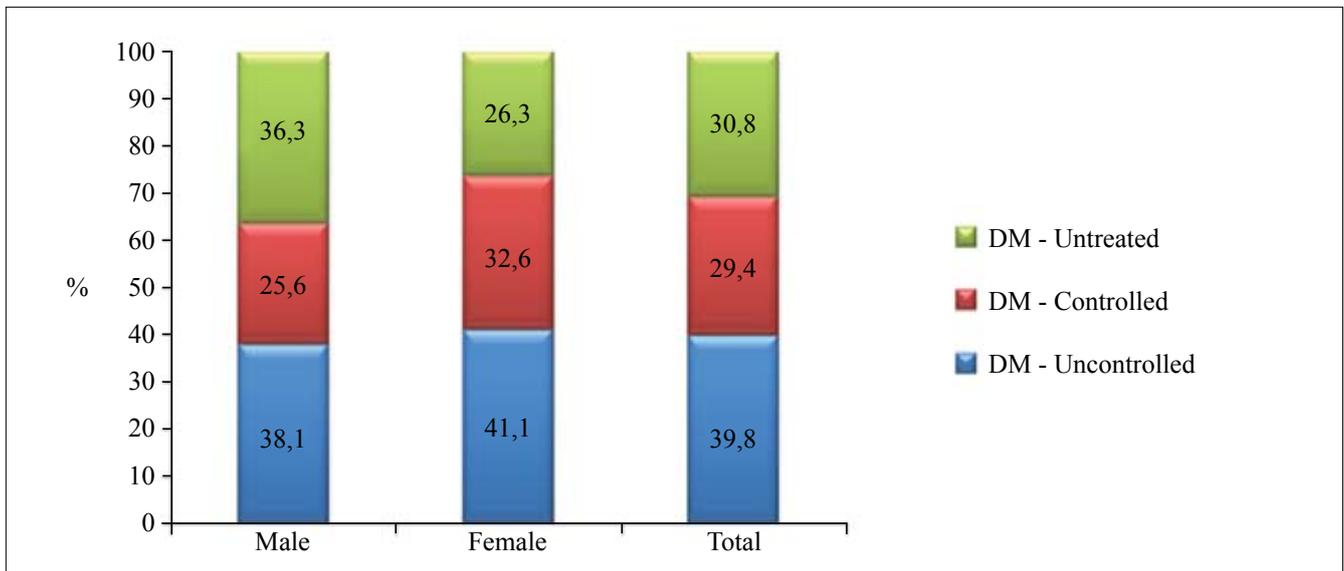


Figure 7.6 Treatment and control rates in individuals with diabetes by sex, Turkey 2011.



When evaluated according to age groups, it is seen that almost half of the population in 65-74 age group (47%) have uncontrolled diabetes (Figure 7.7).

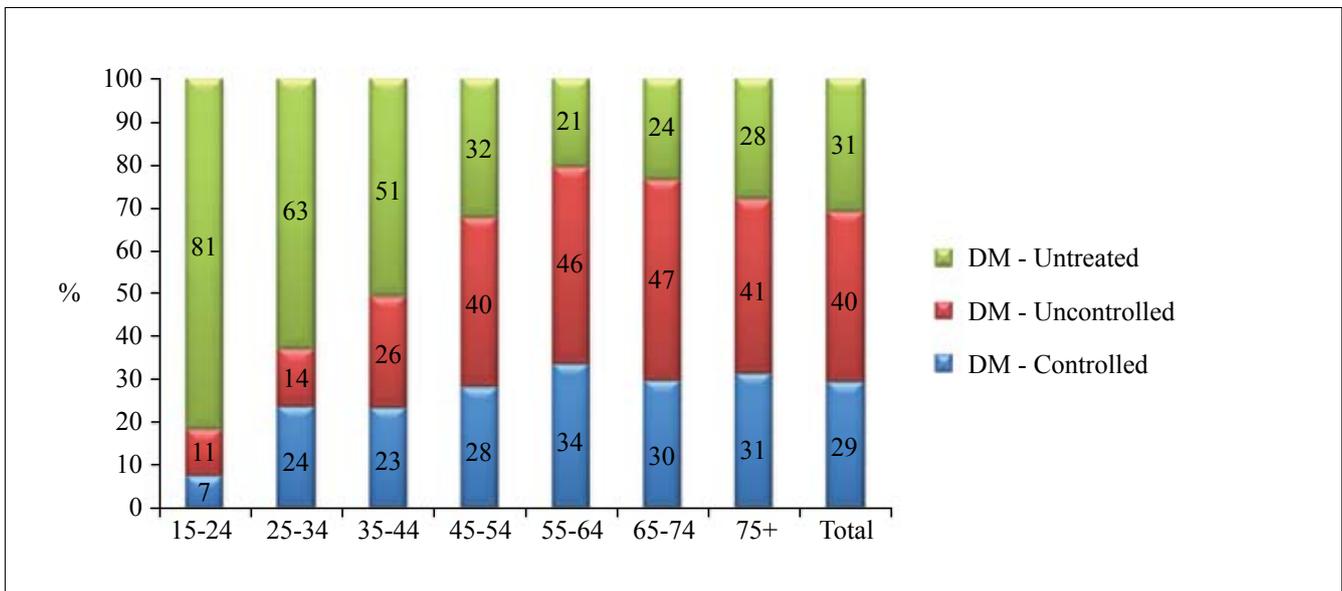


Figure 7.7 Treatment and control rates in individuals with diabetes by age groups, Turkey 2011.

65-74 age group is the one in which uncontrolled diabetes is most prevalent in males (51%). The age group in which uncontrolled diabetes is most prevalent in females is 45-54 age group (48%) (Table 7.6) (Table 7.7).



Table 7.6 Treatment and control rates in diabetic males by age, NUTS1 region and area of residence, Turkey 2011.

Age group	DM-controlled		DM-uncontrolled		DM- untreated	
	n	%	n	%	n	%
15-24	1	7,1	3	21,4	10	71,4
25-34	6	17,1	4	11,4	25	71,4
35-44	14	19,4	17	23,6	41	56,9
45-54	44	28,4	47	30,3	64	41,3
55-64	54	27,6	92	46,9	50	25,5
65-74	31	27,0	59	51,3	25	21,7
75+	16	25,8	26	41,9	20	32,3
NUTS1 region						
İstanbul	34	27,4	45	36,3	45	36,3
Western Marmara	12	27,3	20	45,5	12	27,3
Aegean	22	28,6	30	39,0	25	32,5
Eastern Marmara	18	31,0	18	31,0	22	37,9
Western Anatolia	20	24,4	25	30,5	37	45,1
Mediterranean	20	24,4	36	43,9	26	31,7
Central Anatolia	7	21,2	16	48,5	10	30,3
Western Black Sea	12	28,6	18	42,9	12	28,6
Eastern Black Sea	6	22,2	13	48,1	8	29,6
North-eastern Anatolia	1	7,7	6	46,2	6	46,2
Eastern Central Anatolia	6	23,1	10	38,5	10	38,5
South Eastern Anatolia	8	20,5	9	23,1	22	56,4
Area of residence						
Rural	39	21,4	74	40,7	69	37,9
Urban	124	27,1	172	37,6	162	35,4
Total	166	25,6	247	38,1	235	36,2

Table 7.7 Treatment and control rates in diabetic females by age, NUTS1 region and area of residence, Turkey 2011.

Female	DM-contolled		DM-uncontrolled		DM-untreated	
	n	%	n	%	n	%
Age groups						
15-24	2	14,3	-	-	12	85,7
25-34	8	33,3	3	12,5	13	54,2
35-44	21	26,9	22	28,2	35	44,9
45-54	48	28,1	82	48,0	41	24,0
55-64	90	38,8	104	44,8	38	16,4
65-74	49	31,8	67	43,5	38	24,7
75+	31	35,2	35	39,8	22	25,0
NUTS1 regions						
İstanbul	45	33,6	57	42,5	32	23,9
Western Marmara	13	27,1	23	47,9	12	25,0
Aegean	47	41,2	42	36,8	25	21,9
Eastern Marmara	33	37,5	33	37,5	22	25,0
Western Anatolia	19	25,3	33	44,0	23	30,7
Mediterranean	24	30,8	33	42,3	21	26,9
Central Anatolia	12	30,8	17	43,6	10	25,6
Western Black Sea	23	36,5	32	50,8	8	12,7
Eastern Black Sea	9	39,1	9	39,1	5	21,7
North Eastern Anatolia	2	8,3	10	41,7	12	50,0
Eastern Central Anatolia	6	33,3	7	38,9	5	27,8
South Eastern Anatolia	16	27,1	19	32,2	24	40,7
Area of residence						
Rural	68	28,7	99	41,8	70	29,5
Urban	175	34,3	209	41,0	126	24,7
Total	248	32,6	313	41,1	200	26,2

The rate for untreated diabetes in rural areas (33%) is slightly higher than in urban areas (30%). The rate of uncontrolled diabetes is 41% in rural areas and 39% in urban areas (Figure 7.8).

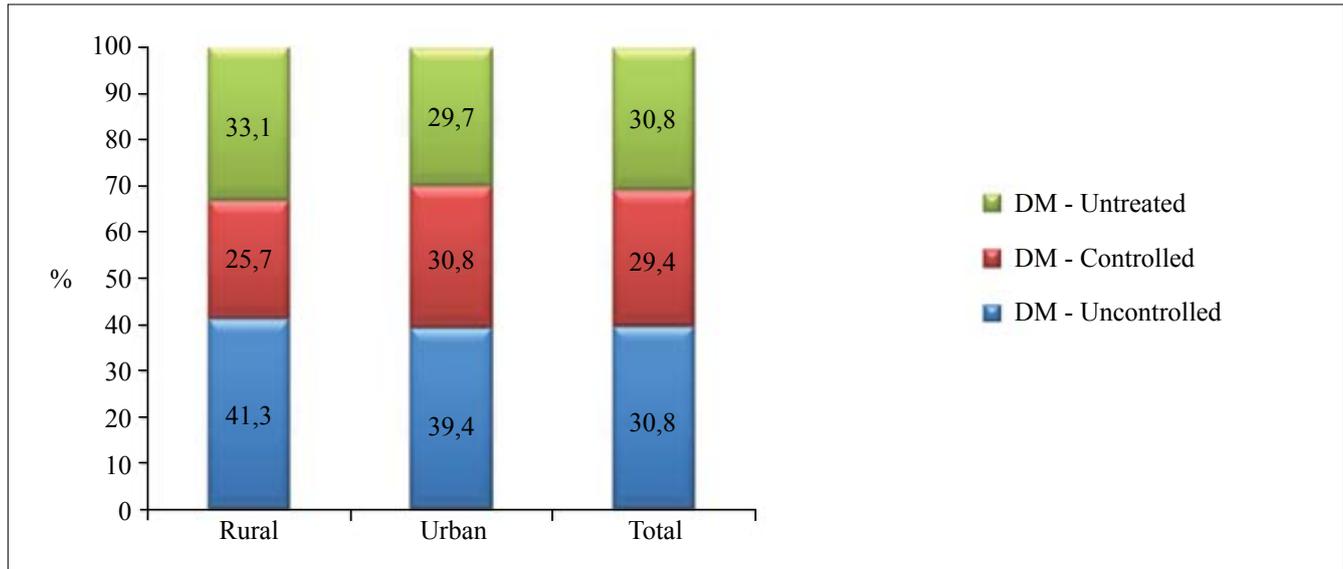


Figure 7.8 Treatment and control rates in individuals with diabetes by area of residence, Turkey 2011.

7.4 Discussion

In this study diabetes prevalence in research population was found 11% according to the results of diabetes diagnosis, determined based on diabetes history, use of medication and fasting plasma glucose measurement, in the population above 15 years of age. The diabetes prevalence standardized according to the 2010 population of Turkey is 10%. There are diabetes prevalence studies in Turkey, which have been conducted since 1998. In the TURDEP-I study conducted in 1998, diabetes prevalence in population above 20 years of age was found 7%, impaired glucose tolerance prevalence was found 7% and new diagnosis prevalence was found 2% (2). Diabetes prevalence in various studies conducted 10 years later TURDEP-I varied between 11% and 16% (4, 9-11). Although these studies had some differences with regard to both age of research population and diabetes diagnosis criteria, it is seen from these studies that there has been a dramatic increase in diabetes prevalence in Turkey in the last 10 years. The findings of TURDEP-II study conducted in 2010 indicates that the diabetes prevalence rates estimated for 20 year later have already been reached (7).

In this study, diabetes diagnosis was done according to diabetes history, use of medications for diabetes, and the fasting plasma glucose measured in venous blood sample. In the diabetes definition in TURDEP II study, oral glucose tolerance was used in addition to these. If the research population is taken as 20-and-above age group, as in TURDEP II, diabetes prevalence is found 12% (Table 7.8). PURE study, conducted in 2009, evaluated diabetes prevalence in terms of diabetes history and FPG measurement results and found the prevalence as 15% in 35-70 age group (11). When the same diabetes definition and age group in PURE study is used in this study, diabetes prevalence is found 17%. In 2008, CREDIT study, which was conducted to determine the chronic kidney disease prevalence in the population above 18 years of age, used the criteria defined in our study in diagnosing diabetes, and diabetes prevalence was found 13% (10) (Table 7.8).



Table 7.8 Diabetes definition criteria used in three previous studies conducted between 2008 and 2011 in Turkey, and comparative results.

	CREDIT	PURE	TURDEP II	Chronic Diseases and Risk Factors Study
Age group	18-and-above	35-70	20-and-above	15-and-above
Year	2008	2009	2010	2011
DM definition	Diabetes history Medication use and FPG	Diabetes history and FPG	Diabetes history, Medication use,FPG and Oral glucose tolerance test	Diabetes history, Medication use and FPG
Prevalence (Crude rates)	% 13,0	% 14,7	% 16,5	% 11,1
Comparative results				% 12,3* % 17,5**

* Taking TURDEP II age group ** Taking PURE age group and same diagnosis criteria

One of the significant findings of TURDEP II study, when compared to the first study in 1998, is that the difference between urban and rural areas, and between females and males in terms of diabetes prevalence had disappeared. In this study, too, diabetes prevalence does not differ substantially by area of residence and sex. In this study a sample that represents the NUTS1 region was used. According to this, the regions in which diabetes prevalence is the highest are Western Marmara and Western Anatolia regions. A similar evaluation was made in TURDEP II study with reference to 5 regions; and the two regions with the highest diabetes prevalence were found as Eastern Anatolia and Western Anatolia (4).

When known diabetes prevalence is considered, the rate found in TURDEP-II is 8%, and it is higher in females (9%) than males (7%) (4). According to the National Household Study, conducted in 2004 by Ministry of Health, diabetes prevalence based on declaration in the population above 18 years of age is 5% (6% in females, 3% in males) (12). In this study, too, known diabetes prevalence is 8%, and it is higher in females (9%) than males (7%).

The findings of this study on prediabetes is similar to the findings of TURDEP II but indicate a higher prediabetes rate than the findings of PURE study (prediabetes rate is 10% in PURE) (11). The prediabetes rate, determined by impaired plasma glucose levels, is 14% without any difference in males and females (4). IFG prevalence found in this study is 16%, and similarly there is not any difference between sexes.

Diabetes awareness, control and being untreated rates are important indicators for efficient control of diabetes. Awareness rate was found 54% in TURDEP II and 87% in PURE (4, 11). In this study awareness rate is 74%, and it is higher in females (78%) than males (69%). When controlled diabetes rates are considered, in the PURE study conducted on 35-70 age group, controlled diabetes prevalence was found 29%, untreated diabetes was found 38% (11). In this study, in which the population above 15 years of age



was evaluated, controlled diabetes rates is 29%, and untreated diabetes is 31%. When the age group in PURE is considered, controlled diabetes rate becomes 29% and untreated diabetes becomes 29% too.

In conclusion the diabetes prevalence in population above 15 years of age is 11% and consistent with the previous studies, if similar age groups and similar diagnosis criteria are used. According to this, diabetes prevalence in Turkey has been increasing and the difference between females and males, and rural and urban areas has been disappearing.

According to the results of the study, one out of five individual in the 45-and-above age group in Turkey is prediabetic. Studies show that the risk for diabetes development in 10 years following isolated IFG diagnosis in a prediabetic individual is 10 to 15%; 35% following IGT diagnosis (13). In case of combined glucose tolerance impairment (IFG + IGT) the 10 years diabetes risk increases up to 50%. On the other hand, it has been shown that with simple life style changes type II diabetes risk could be prevented or delayed at a rate up to 58% (14-16). The prevalence obtained in this study emphasises the importance of preventing diabetes development in our country.

In addition to prevention of diabetes, early diagnosis of individuals with diabetes, and efficient control of the disease should be ensured. The distribution of the individuals with untreated diabetes, controlled diabetes and uncontrolled diabetes is approximately 1/3. According to the results of the study, almost one fourth of the diabetics in our country are not aware of their disease; this unawareness is higher in males, while uncontrolled diabetes prevalence is higher in females. In order to lighten the burden of diabetes on the individual and the society, it is necessary to prevent the development of the disease, to diagnose the disease early as possible, and to treat appropriately.



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8

Blood Cholesterol Levels and Hyperlipidemia





8 Blood Cholesterol Levels and Hyperlipidemia

Dr. Melih Kaan SÖZMEN

Key Findings

- This section presents the high total cholesterol, LDL-cholesterol, triglyceride and low HDL-cholesterol prevalence and averages in population above 15 years of age. Also, the awareness, treatment and control rates of the disease are evaluated by sex, age groups, area of residence and NUTS1 regions.
- 14% of the participants have high cholesterol levels based on medical history (12% in males and 16% in females).
- 55% of males and %49 females with high cholesterol history have not been using any medication.
- 65% of the participant who were diagnosed with high LDL-cholesterol by test also declared hyperlipidemia based on physician diagnosis (high cholesterol awareness); this rate is %58 in males and 69% females.
- According to the data obtained by medical history and tests, the total high LDL cholesterol prevalence in the study was found 12.5%; 11% in males and 14% in females.
- Hyperlipidemia prevalence increases in both males and females with age. This prevalence is higher in females than males in each age group starting with 45-54 age groups.
- Hyperlipidemia prevalence is higher in participants who live in urban areas than rural areas. When evaluated in terms of NUTS1 regions the highest prevalence is in Western Anatolia (18.1% in males and, 16.9% in females).
- In the group with hyperlipidemia, LDL-cholesterol levels of 38.1% of males and 39.9% of females are under control.



8.1 Introduction

One of the significant factors of cardiovascular diseases is the high level of blood cholesterol. A great proportion of the cholesterol in the blood is carried as LDL-cholesterol (LDL-C). The relation of high LDL-C or total cholesterol levels to the atherosclerosis and following coronary incidents has been shown in various epidemiological studies, especially Framingham Heart Study (1,2). HDL-Cholesterol (HDL-C) carries the cholesterol back to the liver through veins; therefore it is called as useful or good cholesterol. Low HDL-C is an independent risk factor that increases the risk of cardiovascular disease morbidity and mortality. On the contrary, high HDL-C levels reduce the risk of CVD development. A 1% decrease in HDL-C levels increases the CVD risk by 2-3% (1,3). It has been a controversy whether the triglycerides (TG), one of blood fats, were a risk factor for cardiovascular diseases. In a meta-analysis, high TG levels were found as a risk factor for cardiovascular diseases, independent of HDL-C levels (4).

High cholesterol is defined, in many studies, as 200 mg/dl or higher total cholesterol levels (5). In TEKHARF study, conducted in 1990 in Turkey, high cholesterol prevalence in females was found 36.9% and in males 33.5%(6). In the Trabzon Lipid Study conducted in 2003 in Trabzon, high cholesterol prevalence was found 50.5% in females and 47.2% in males; it was found 59.8% in females and 56.0% in males in the Heart of Balçova study, conducted in Balçova, İzmir in 2008 (7,8).

This section presents the prevalence of risky values in blood cholesterol levels in the population above 15 years of age. Also the awareness, treatment and control rates for dyslipidemia are evaluated by sex, age groups, area of residence and NUTS1 regions.

8.2 Methods and Definitions

The lipid analyses were conducted in the public health laboratories by taking blood samples from the participants after at least 8 hours of fasting. Total Cholesterol, LDL-C, HDL-C and TG measurements were obtained from 14887 participants in the study. During the data cleaning process, extreme values for each parameter was excluded from the analysis.

In the classification of cholesterol levels, American National Cholesterol Education Program / Adult Treatment Panel's (NCEP / ATP III) criteria were used (9). Total cholesterol was classified as normal if it was ≤ 199 mg/dl, as borderline high if it was between 200 and 239 mg/dl and as high if $TC \geq 240$. The limit values for low HDL cholesterol were defined as 40 mg/dl for males and 50 mg/dl for females. For LDL cholesterol, 99 mg/dl and below was classified as Ideal, 100-129 mg/dl as normal, 130-159 mg/dl as borderline high, 160-189 mg/dl as high, 190 mg/dl and above as very high. For triglyceride, 150 mg/dl and below was classified as normal, 150-199 mg/dl as borderline high, 200-499 mg/dl as high and 500 mg/dl and above as very high.

Hyperlipidemia Diagnosis Treatment and Control Definitions

LDL-cholesterol levels of 160 mg/dl and above or the use of antihyperlipidemic medication was defined as "having hyperlipidemia". Hyperlipidemia awareness was defined as declaring hyperlipidemia depending on physician diagnosis among the participants who were diagnosed with high LDL cholesterol. In participants with hyperlipidemia, LDL-cholesterol levels below 160 mg/dl were defined as cholesterol levels under control.



8.3 Findings

Blood Lipid Levels By Age and Sex

Total cholesterol averages and high total cholesterol prevalence are given in Table 8.1. Recent treatment guidelines suggest that the total cholesterol level should be below 200 mg/dl. When this value is taken as the limit, 27% of males and 32% of females have high total cholesterol levels.

Table 8.1 Mean total cholesterol and categories of total cholesterol by age groups and sex, Turkey 2011.

	Age Groups							Total
	15-24	25-34	35-44	45-54	55-64	65-74	75+	
Male								
Average	148.8	172.7	185.3	193.5	190.4	182.6	178.0	177.4
Standard Error	0.9	0.9	1.0	1.1	1.4	1.8	2.3	0.5
<200 mg/dl	93,7	79,8	66,9	59,7	61,5	67,2	71,3	72,9
200-239 mg/dl	5,4	15,5	25,0	27,9	28,7	25,5	24,3	20,3
≥240 mg/dl	0,9	4,7	8,2	12,4	9,8	7,2	4,5	6,8
Total (n)	1302	1418	1349	1200	885	470	269	6893
Female								
Mean	153.7	170.5	185.4	199.5	206.2	204.9	195.1	183.2
Standard Error	0.8	0.9	0.9	1.1	1.4	1.8	2.2	0.5
<200 mg/dl	94,2	82,3	68,6	52,0	45,3	47,5	53,8	68,3
200-239 mg/dl	5,2	14,6	24,6	34,1	33,6	33,3	33,5	22,7
≥240 mg/dl	0,6	3,1	6,9	13,9	21,1	19,2	12,6	9,0
Total (n)	1460	1619	1546	1417	919	541	364	7866

High total cholesterol prevalence in males up to 45 years of age is slightly higher than females; however high cholesterol is more prevalent in females than males after 45 years of age (Figure 8.1).

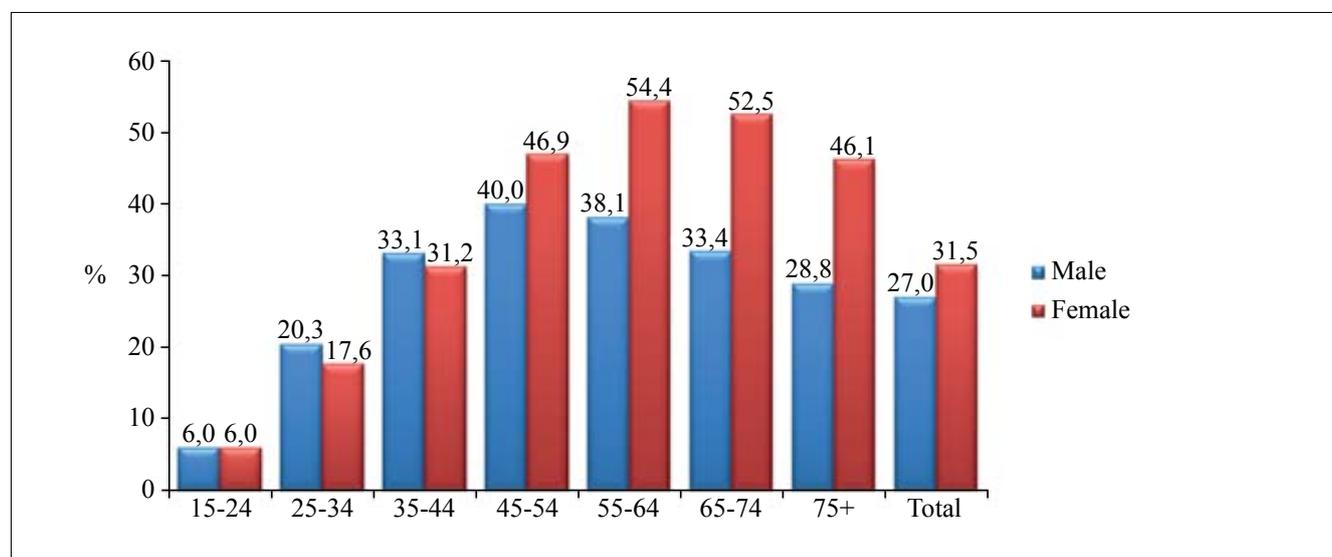


Figure 8.1 High total cholesterol prevalence (200 mg/dl and above) by age and sex, Turkey 2011.



It was found that high total cholesterol prevalence was higher in Western Anatolia and Western Marmara regions than other NUTS1 regions. Also, high total cholesterol prevalence is higher in urban areas than rural areas (Figure 8.2 and Table 8.2).

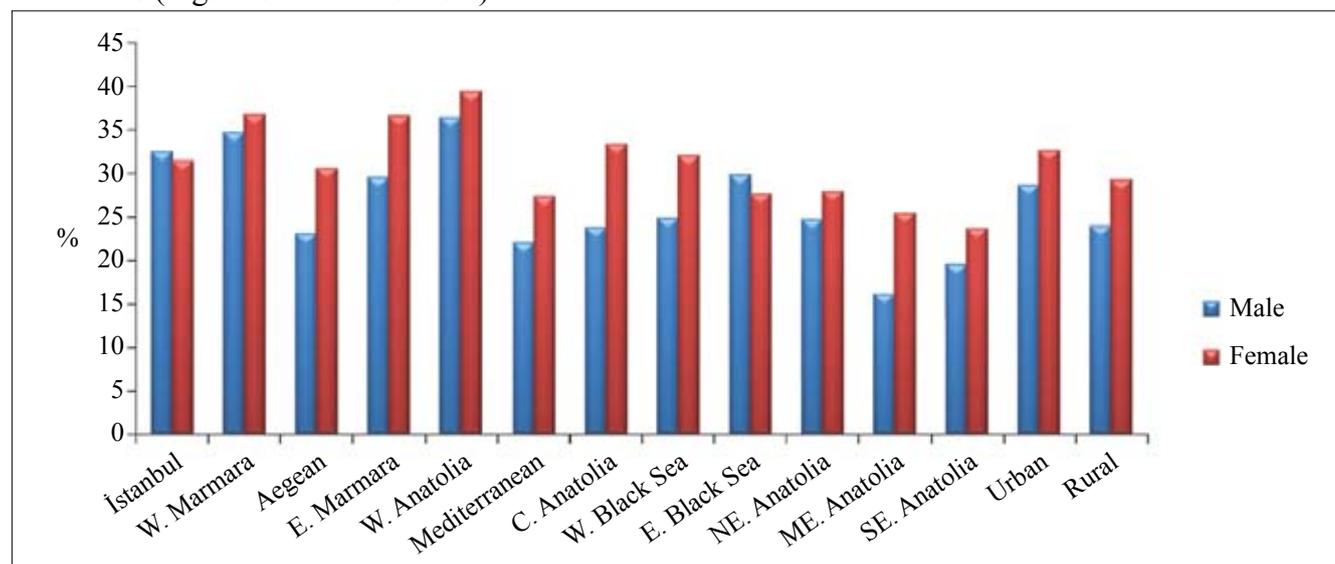


Figure 8.2 High total cholesterol prevalence (200 mg/dl and above) by NUTS1 regions and area of residence, Turkey 2011.

Table 8.2 Mean Total Cholesterol levels and categories by NUTS1 Regions and area of residence, Turkey 2011.

	Male				Female			
	Mean	±S _x	%*	Total	Mean	±S _x	%*	Total
NUTS1 Regions								
İstanbul	181,8	1,1	32,5	1284	182,3	1,1	31,3	1495
Western Marmara	185,9	2,3	34,8	353	190,9	2,2	36,6	377
Aegean	174,1	1,3	23,2	953	182,6	1,1	30,9	1174
Eastern Marmara	180,9	1,5	29,9	719	188,7	1,5	36,9	803
Western Anatolia	189,6	1,6	38,2	631	193,32	1,5	40,3	807
Mediterranean	172,1	1,3	22,3	912	177,7	1,2	27,2	978
Central Anatolia	172,4	2,1	22,8	369	182,9	2,0	32,5	436
Western Black Sea	173,6	1,8	24,7	450	182,3	1,9	32,7	510
Eastern Black Sea	182,2	2,5	30,4	256	181,6	2,2	27,7	274
North Eastern Anatolia	175,3	2,9	24,1	191	182,3	2,8	27,8	187
Eastern Central Anatolia	164,1	1,9	12,1	282	175,1	2,3	25,2	285
South Eastern Anatolia	168,6	1,8	19,5	494	174,7	1,7	23,7	541
Area of residence								
Rural	179,2	0,6	28,7	4759	184,5	0,6	32,9	5624
Urban	173,5	0,9	23,6	2035	180,4	0,9	29,2	2108

* High Total cholesterol (>200 mg/dl)



When the risk level is accepted as 160 mg/dl and above for LDL-C, 8.1% of females and 6.8% of males are in this category. High LDL-C prevalence is similar in both males and females up to 55 years of age; however it the prevalence is higher in females than males after 55 years of age (Figure 8-3 and Table 8-3).

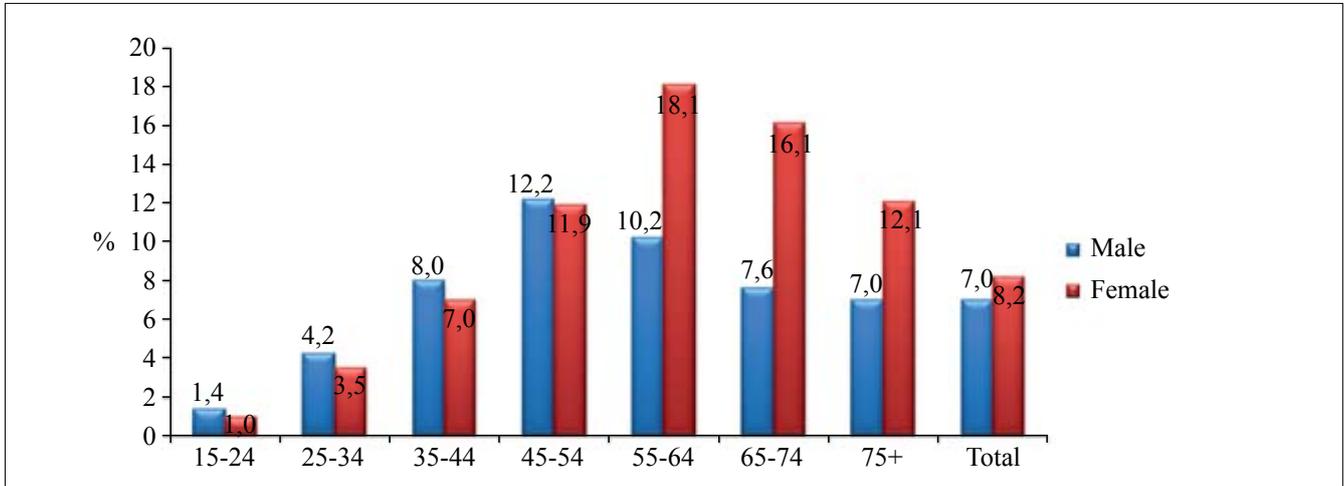


Figure 8.3 High LDL-C prevalence (≥160 mg/dl) by age and sex, Turkey 2011.

Table 8.3 Mean LDL Cholesterol levels and categories distribution by age and sex, Turkey 2011.

	Age Groups							
	15-24	25-34	35-44	45-54	55-64	65-74	75+	Total
Male								
Mean	85.3	104.5	112.5	118.0	117.4	113.0	110.2	107.0
S _x	0.85	0.95	0.93	1.09	1.35	1.60	1.99	0.45
Ideal (≤99)	72,8	47,9	37,3	32,3	32,5	34,9	42,9	44,8
Normal (100-129)	21,6	33,2	34,0	34,8	35,5	36,8	27,2	31,8
Borderline high (130-159)	4,2	14,6	20,6	20,6	21,8	20,7	22,8	16,5
High (160-189mg/dl)	0,9	2,5	5,9	9,3	7,3	6,1	6,3	5,1
Very High (≥190mg/dl)	0,5	1,7	2,1	2,9	2,9	1,5	0,7	1,9
Total (n)	1287	1396	1328	1177	864	459	266	6777
Female								
Mean	87.9	101.1	112.0	122.0	126.5	126.3	119.5	109.8
S _x	0.77	0.80	0.84	0.95	1.23	1.66	1.93	0.41
Ideal (≤99 mg/dl)	71,5	52,4	36,5	26,0	23,4	21,8	30,4	41,6
Normal (100-129 mg/dl)	22,8	33,1	37,5	34,7	31,6	35,1	34,8	32,4
Borderline high (130-159 mg/dl)	4,6	10,9	19,1	27,3	26,9	27,1	22,7	17,8
High (160-189 mg/dl)	0,5	2,4	5,4	8,2	13,9	11,2	9,1	5,9
Very High (≥190 mg/dl)	0,6	1,1	1,6	3,7	4,2	4,9	3,0	2,3
Total (n)	1446	1602	1522	1397	902	536	362	7767

High LDL-C prevalence is higher in Western Anatolia, North-eastern Anatolia and Eastern Black Sea regions when compared to other regions (Figure 8-4 and Table 8-4).

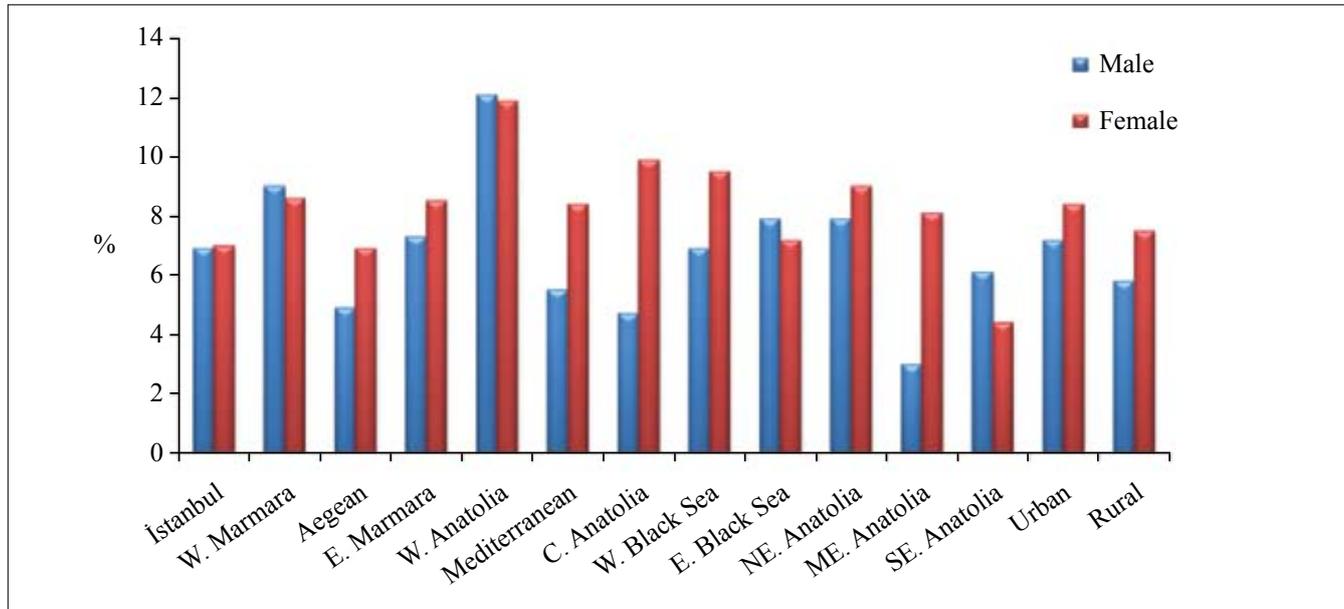


Figure 8.4 High LDL-C prevalence (160 mg/dl or above) by NUTS1 regions and area of residence, Turkey 2011.

Table 8.4 Mean LDL Cholesterol levels (mg/dl) and categories distribution by NUTS1 regions and area of residence, Turkey 2011.

NUTS1 Regions	Male				Female			
	Mean	±S _x	%*	Total (n)	Mean	±S _x	%*	Total (n)
İstanbul	108,1	1,1	7	1259	108,4	0,9	7	1493
Weastern Marmara	112,5	2,2	9,3	346	111,6	1,9	8,9	370
Aegean	104,3	1,1	5	938	112,2	1,9	7	1161
Eastern Marmara	108,8	1,2	7,5	720	108,8	1,1	8,8	798
Weastern Anatolia	120,9	1,6	12,9	618	111	1,3	12,6	782
Mediterranean	105,5	0,2	5,4	905	120,4	1,3	8,5	966
Central Anatolia	100,1	1,8	4,7	361	108,9	1,1	9,8	431
Western Black Sea	105,3	1,5	7,1	449	112,2	2,3	9,5	512
Eastern Black Sea	113,2	2,1	7,7	258	110,3	1,7	6,9	276
North Eastern Anatolia	109,6	3,6	7,9	176	109,2	1,9	8,5	177
Eastern Central Anatolia	96,7	1,8	3	268	112,3	2,9	7,3	273
South Eastern Anatolia	100,3	1,7	6,4	486	106,4	1,9	4,5	530
Area of Residence								
Rural	103,9	0,8	6	1995	107,9	0,8	7,7	2052
Urban	108,7	0,5	7,4	4689	111,2	0,5	8,5	5582

* High LDL-K > 160 mg/dl

While HDL-C mean was found 43.23±0.15 mg/dl in males, it was 50.32±0.15 mg/dl in females. When low HDL-C levels are accepted as risky, 46.6% of males and 56.8% of females were found to have low HDL-C values (Figure 8.5 and Table 8.5).

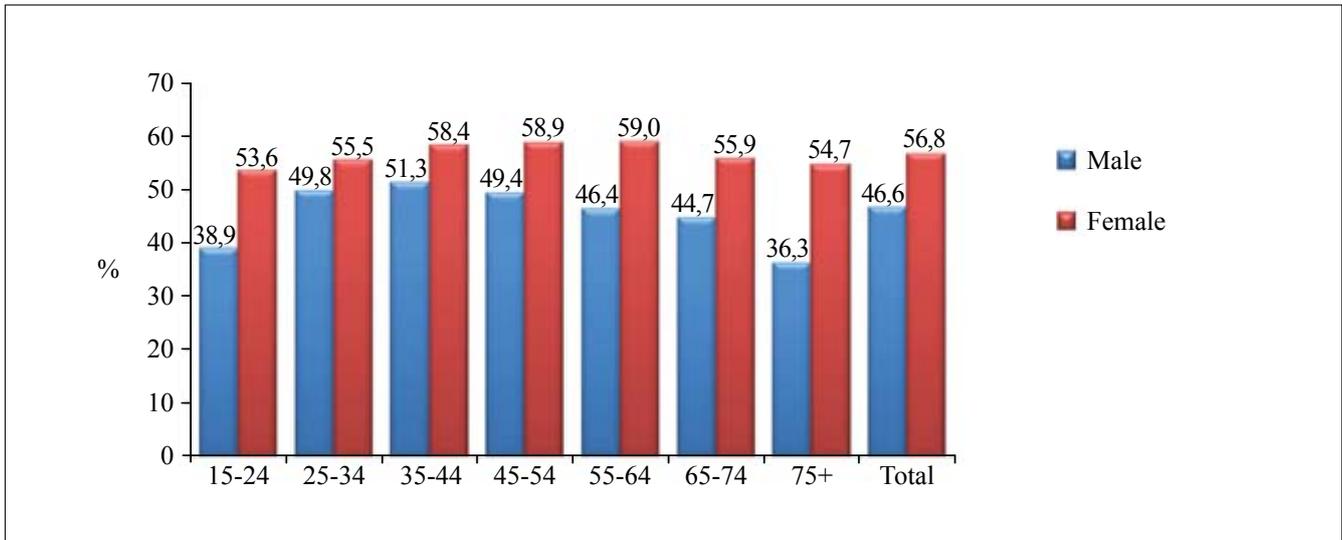


Figure 8.5 Low HDL-Cholesterol prevalence by age and sex, Turkey 2011.

Low HDL-C prevalence is similar in all NUTS1 regions except for Aegean and Eastern Marmara regions. For females, South-eastern Anatolia, and for males Eastern Central Anatolia regions are the regions with the highest risk (Figure 8-6 and Table 8-5).



Table 8.5 HDL Cholesterol mean (mg/dl) and categories by age, sex, NUTS1 regions and area of residence, Turkey 2011.

	Sex								
	Male			Female			Total		
	n	%	Mean ±S _x	n	%	Mean ±S _x	n	%	Mean ±S _x
Age Groups									
15-24	500	38,9	44,7±0,3	784	53,6	51±0,3	1284	46,7	48±0,2
25-34	686	49,8	42,2±0,2	887	55,5	50,8±0,3	1593	52,8	46,8±0,2
35-44	675	51,3	41,4±0,2	901	58,4	49,9±0,3	1586	55,1	45,9±0,2
45-54	594	49,4	42,5±0,3	826	58,9	49,5±0,3	1420	54,5	46,3±0,2
55-64	402	46,4	43,5±0,4	537	59,0	50±0,5	940	52,7	46,6±0,3
65-74	201	44,7	43,8±0,6	305	55,9	50,2±0,5	506	50,8	47,2±0,4
75+	98	36,3	44,8±0,7	197	54,7	49,7±0,7	295	46,8	47,6±0,6
Area of Residence									
Rural	625	47,8	42,3±0,2	842	55,5	50,5±0,3	1467	51,9	46,7±0,2
Urban	166	46,5	42,6±0,6	216	57,4	50,1±0,6	382	52,1	46,5±0,4
NUTS1 Regions									
İstanbul	333	34,5	45,0±0,3	637	54,0	51,2±0,3	969	45,2	48,4±0,2
Weastern Marmara	240	33,2	45,7±0,3	370	45,6	53,7±0,4	611	39,8	50,0±0,3
Aegean	342	53,9	40,7±0,4	453	57,9	49,6±0,4	795	56,1	45,7±0,3
Eeastern Marmara	449	49,5	42,3±0,4	585	60,6	49,1±0,4	1034	55,2	45,8±0,3
Weastern Anatolia	199	55,0	43,2±0,8	274	63,7	48,9±0,8	473	59,7	46,3±0,6
Mediterranean	244	53,3	41,7±0,5	300	58,3	49,2±0,5	544	55,9	45,7±0,4
Central Anatolia	100	39,5	44,5±0,7	139	50,5	51,5±0,8	238	45,2	48,1±0,5
Western Black Sea	69	38,8	45,0±1,1	110	62,5	48,3±0,9	180	50,6	46,6±0,7
Eastern Black Sea	131	49,4	40,9±0,8	176	61,5	48,2±0,7	307	55,7	44,6±0,6
North Eastern Anatolia	262	54,2	41,2±0,4	340	64,4	48,49±0,6	602	59,5	45,0±0,4
Eastern Central Anatolia	905	43,6	42,5±0,1	1229	56,1	50,3±0,1	2135	50,1	47,2±0,2
South Eastern Anatolia	2199	47,8	44,0±0,3	3129	56,9	50,4±0,3	5328	52,1	46,7±0,1

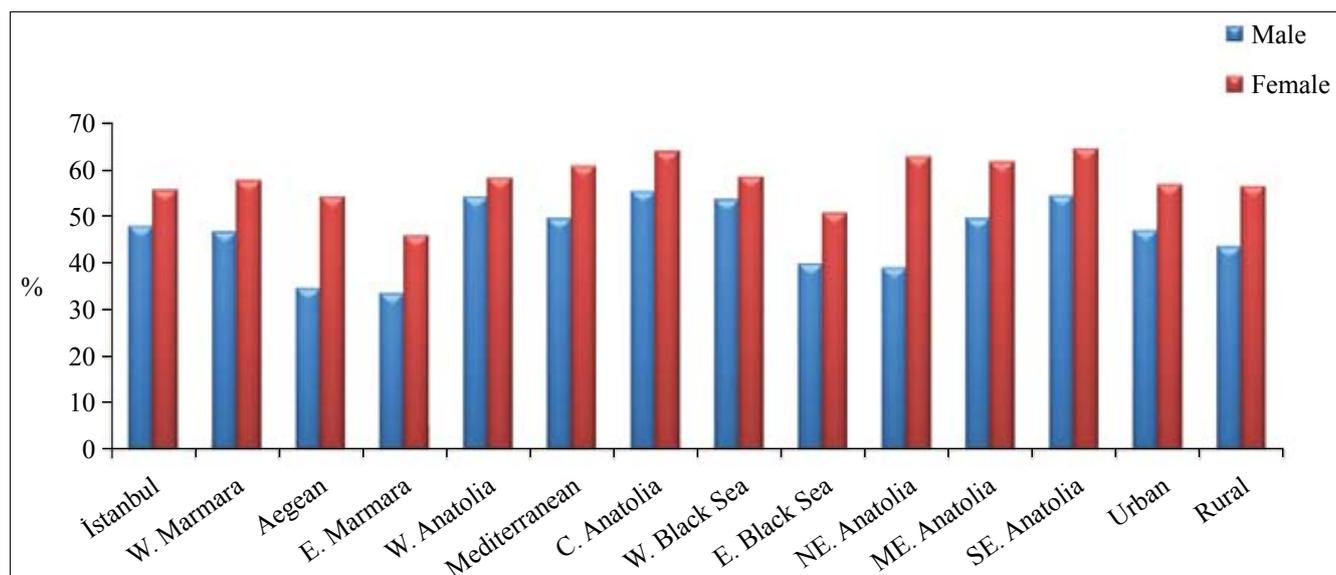


Figure 8.6 Low HDL-Cholesterol prevalence by NUTS1 regions and area of residence, Turkey 2011.

Mean triglyceride level is higher in males (150.25 ± 1.27 mg/dl) than females (122.32 ± 0.87 mg/dl). When 200 mg/dl and above values for triglyceride are accepted as risky for cardiovascular diseases 21% of males and 12% of females have risky values. The high TG prevalence is higher in males than females up to 45-54 age group. In the following age groups, while the prevalence decreases in males, the increase in females attracts attention (Table 8.6 and Figure 8.7).

Table 8.6 Mean triglyceride levels and categories distribution by age and sex, Turkey 2011.

	Age Groups							Total
	15-24	25-34	35-44	45-54	55-64	65-74	75+	
Male								
Mean	106.9	151.6	169.4	174.7	161.7	141.4	124.2	150.2
S _x	2.06	2.89	3.15	3.31	3.43	4.24	2.28	1.27
Normal	83,2	62,2	53,8	52,9	57,8	66,1	74,3	63,1
Borderline high	9,2	16,1	20,0	19,3	19,0	13,9	14,9	16,3
High	7,1	19,7	23,9	25,8	21,5	18,9	10,0	19,0
Very High	0,5	2,0	2,3	2,0	1,7	1,1	0,7	1,6
Total (n)	1303	1419	1345	1200	883	466	269	6885
Female								
Mean	83.4	101.5	124.6	145.7	156.5	150.6	141.7	122.3
S _x	1.13	1.59	1.96	2.35	2.94	3.30	3.89	0.87
Normal	92,9	84,7	74,7	63,9	55,5	59,4	64,4	74,4
Borderline high	4,9	9,0	13,8	17,7	22,6	19,3	20,3	13,6
High	2,2	6,0	11,2	17,2	21,2	20,9	14,5	11,5
Very High	0,0	0,2	0,4	1,2	0,7	0,4	0,8	0,5
Total	1466	1619	1541	1411	915	545	368	7864

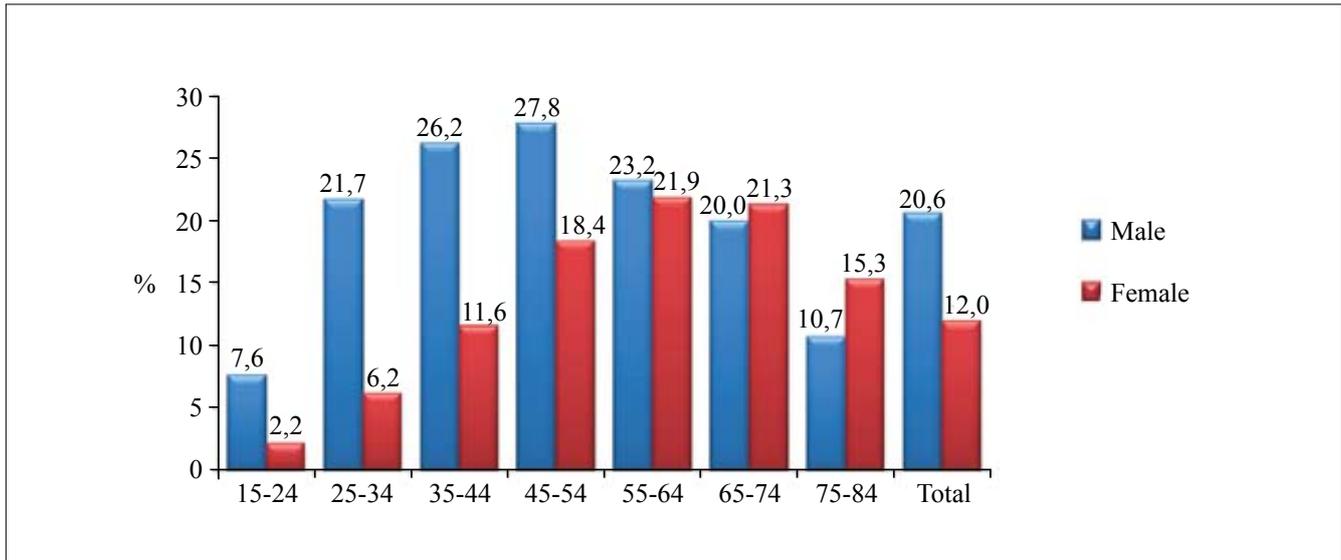


Figure 8.7 High triglyceride prevalence by age and sex, Turkey 2011.

The high triglyceride prevalence is highest in İstanbul for males and highest Central Anatolia for females. High triglyceride prevalence is higher in urban areas than rural areas (Table 8.7).

Table 8.7 Mean triglyceride levels and categories distribution by NUTS1 regions and area of residence, Turkey 2011.

	Male				Female			
	Mean	$\pm S_x$	%*	Total (n)	Mean	$\pm S_x$	%*	Total (n)
NUTS1 Regions								
İstanbul	175,6	3,8	29,1	1279	122,4	2,1	11,7	1494
Weastern Marmara	158,5	6	21,4	351	124,1	3,7	12,5	376
Aegean	136,2	2,9	15,4	951	122,4	2,3	11,6	1172
Eastern Marmara	145,3	3,5	17,7	721	127,2	2,9	12,2	805
Weastern Anatolia	151,6	3,8	19,3	627	121,7	2,6	11,9	799
Mediterranean	142,4	3,3	19,5	913	117,8	2,3	11,2	978
Central Anatolia	149,6	5,2	22,5	372	136,9	4,2	17,2	437
Western Black Sea	135,5	3,9	16,4	451	118,2	3,3	12	509
Eastern Black Sea	132,9	5,4	13,4	255	109,5	4,1	7,3	276
North Eastern Anatolia	146,6	6,9	16,8	190	125,4	6,5	16,2	185
Eastern Central Anatolia	146,5	5,8	20,2	281	111	3,4	4,9	286
South Eastern Anatolia	152,6	4,6	23,8	495	126,2	3,5	15,1	546
Area of Residence								
Rural	141,8	2,2	18,2	2030	120,1	1,6	11,3	2112
Urban	153,8	1,6	21,5	4755	122,3	1,1	12,2	5617

* High triglyceride (>200mg/dl)



Hyperlipidemia was defined as medication use or LDL-C > 160 mg/dl and above in participants not using cholesterol medication. Accordingly, 10.0% of males and 12.6 of females have hyperlipidemia. In both sexes, hyperlipidemia is most prevalent in 55-64 age group (Figure 8.8 and Table 8.8)

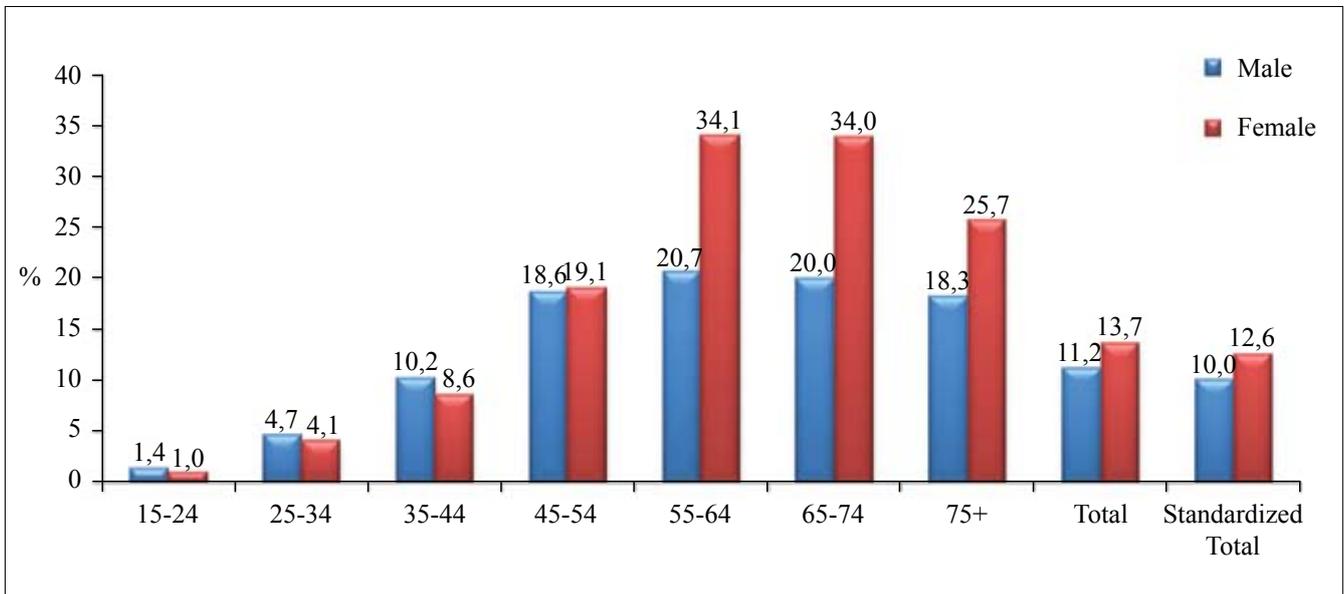


Figure 8.8 Hyperlipidemia prevalence by age and sex, Turkey 2011.



Table 8.8 Hyperlipidemia prevalence by age, sex, NUTS1 regions and area of residence, Turkey 2011.

	Sex					
	Male		Female		Total	
	n	%*	n	%*	n	%*
Age Groups						
15-24	18	1,4	15	1,0	33	1,2
25-34	66	4,7	66	4,1	132	4,4
35-44	136	10,2	131	8,6	267	9,4
45-54	219	18,6	267	19,1	486	18,9
55-64	179	20,7	308	34,1	486	27,5
65-74	92	20,0	182	34,0	274	27,5
75+	49	18,3	93	25,7	143	22,7
Area of Residence						
Rural	184	9,2	277	13,5	461	11,4
Urban	566	12,1	773	13,8	1339	13,0
NUTS1 Regions						
İstanbul	137	10,9	183	12,3	320	11,6
Weastern Marmara	52	15,0	58	15,7	110	15,4
Aegean	84	11,7	156	13,5	240	11,4
Eastern Marmara	83	13,3	113	14,2	197	13,0
Western Anatolia	109	16,9	142	18,1	251	17,9
Mediterranean	94	16,2	114	11,8	208	11,1
Central Anatolia	33	9,1	64	14,8	96	12,2
Western Black Sea	55	12,3	91	17,8	146	15,2
Eastern Black Sea	33	12,9	37	13,5	70	13,1
North Eastern Anatolia	18	10,4	25	13,9	43	12,2
Eastern Central Anatolia	16	5,9	33	12,2	49	9,1
South Eastern Anatolia	44	9,0	45	8,5	89	8,8
Total 15 and above	758	11,2	1061	13,7	1819	12,5
		(10,4-11,9)		(12,9-14,4)		(11,9-13,0)
Total 20 and above	755	12,5	1052	15,0	1807	13,8
		(11,7-13,3)		(14,1-15,8)		(13,2-15,8)
Total 30 and above	721	14,9	1024	18,5	1745	16,8
		(13,9-15,9)		(17,4-19,5)		(16,1-17,5)

* Hyperlipidemia: Medication use or LDL-C \geq 160 mg/dl

** Standardized using Turkey 2010 population

() Total rates are represented with 95% Confidence Interval



Hyperlipidemia prevalence is highest in Western Anatolia region. The prevalence is higher in participants living in urban areas than in rural areas (Figure 8.9)

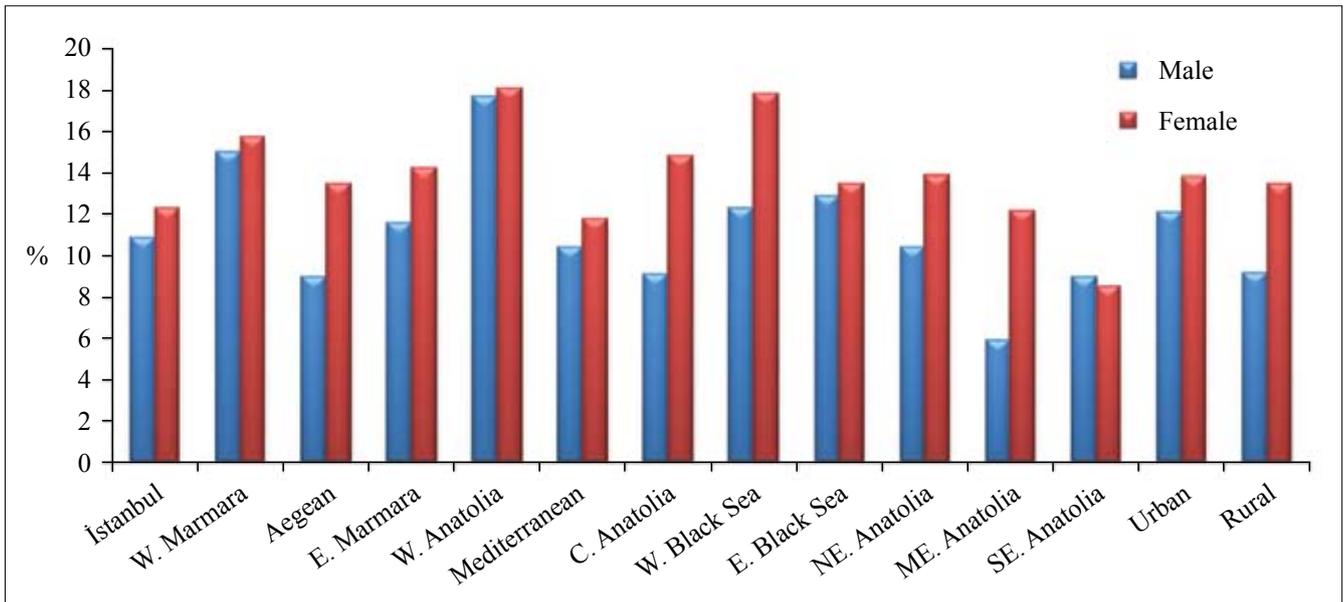


Figure 8.9 Prevalence of hyperlipidemia by NUTS1 regions and area of residence, Turkey 2011.

While 45.2% of males with hyperlipidemia receive treatment, this ratio is 51.0% in females. The rate for medication use is more than half in both sexes above 55 years of age. 38.1% of males with hyperlipidemia have LDL-C levels below 160 mg/dl; this rate is 39.9% in females (Figure 8.9 and Table 8.9).

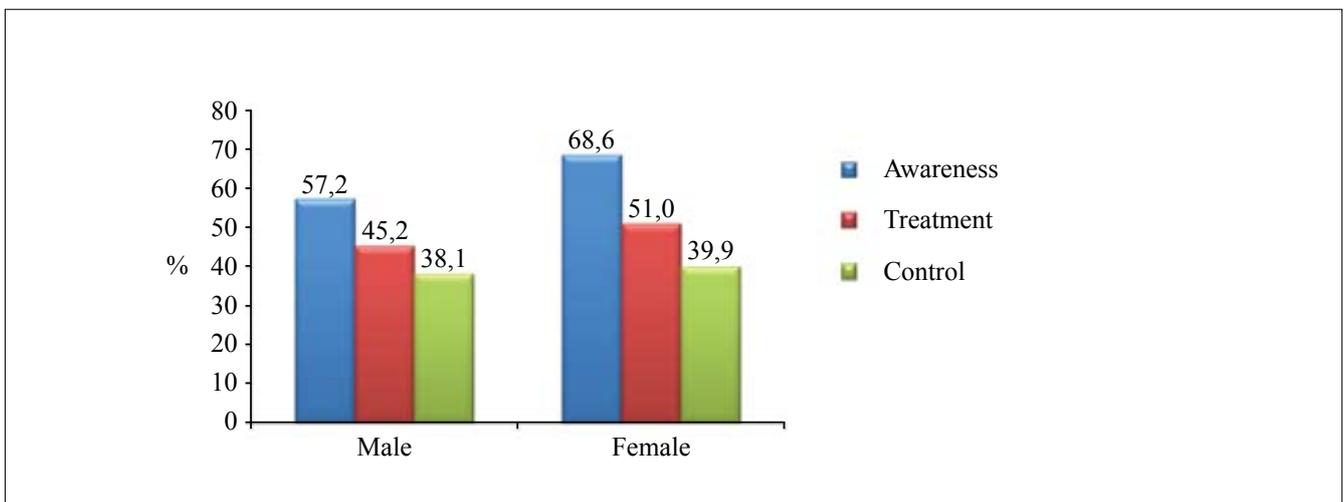


Figure 8.10 Hyperlipidemia awareness, treatment and control prevalences, Turkey 2011.

The highest awareness rate in males is in Aegean region (66.5%), and in females it is in İstanbul (74.8%). The rate for receiving treatment is the highest for males in Eastern Central Anatolia (55.6%) and for females in South-eastern Anatolia, Aegean and Eastern Black Sea region (over 57%). While 50.9% of males with hyperlipidemia in Central Anatolia have controlled LDL-C levels, this rate is 49.6% in Eastern Black Sea region for females (Figure 8.10, 8.11 and Table 8.9).

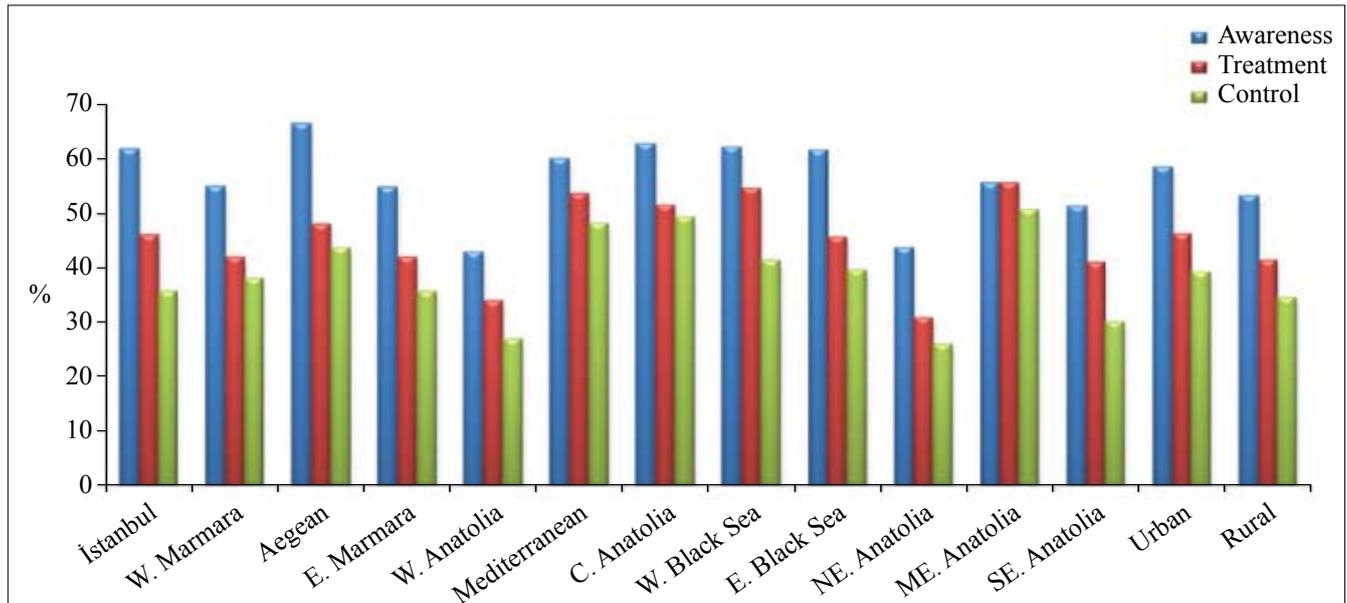


Figure 8.11 Hyperlipidemia awareness treatment, and control in males by NUTS1 regions and area of residence, Turkey 2011.

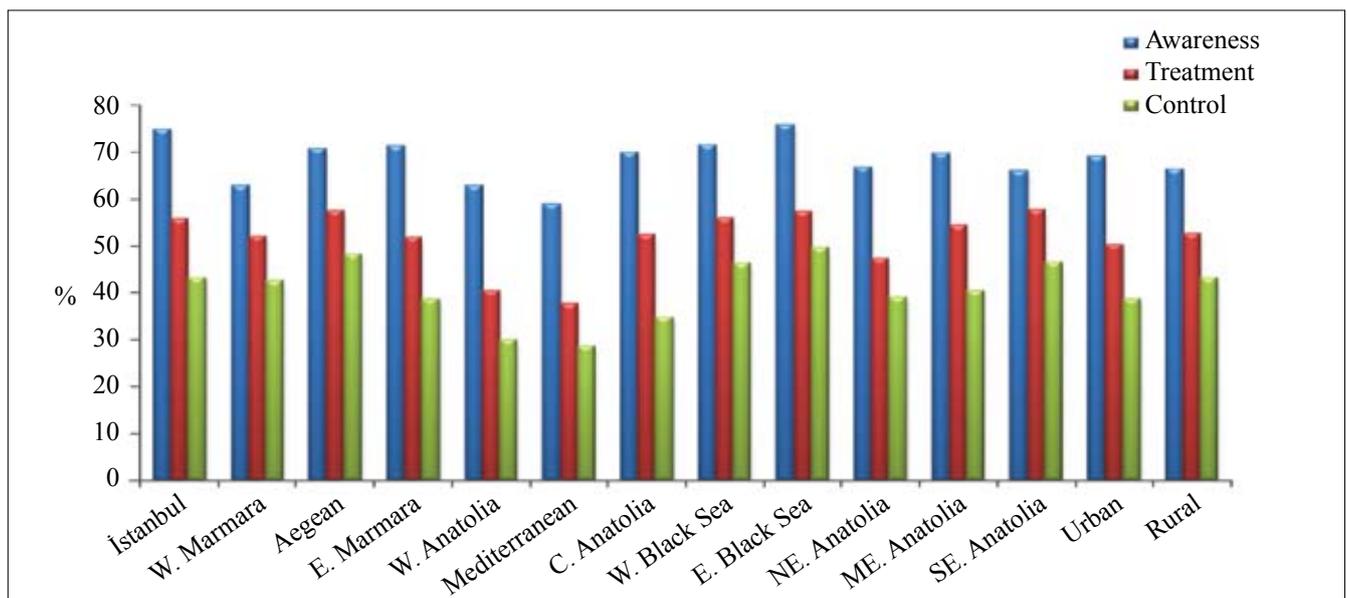


Figure 8.12 Hyperlipidemia awareness, treatment and control in females by NUTS1 regions and area of residence, Turkey 2011.



Table 8.9 Hyperlipidemia awareness, treatment and control prevalence by NUTS1 regions and area of residence, Turkey 2011.

	Male			Female		
	Awareness	Treatment	Control	Awareness	Treatment	Control
Age Group						
15-24	19,2	5,4	5,4	16,6	5,5	0
25-34	25	17,7	10,5	30,5	13,6	13,6
35-44	43,6	27,3	21,2	49,6	26,5	18,9
45-54	59,1	41,4	34,1	70,6	49,7	37,6
55-64	68,2	59,5	49,3	76,1	53,8	47,0
65-74	71,9	69,3	61,8	76,9	65,6	52,7
75+	71,4	71,1	51,1	76,3	65,6	52,6
İstanbul	61,9	46,2	35,8	74,8	55,6	43
Western Marmara	55,1	42,0	38,2	62,7	51,9	42,6
Aegean	66,5	48,0	43,9	70,6	57,4	48,2
Eastern Marmara	54,9	42,1	35,9	71,3	51,8	38,5
Western Anatolia	43,0	34,1	27,0	62,8	40,3	30,0
Mediterranean	60,2	53,7	48,2	58,9	37,5	28,5
Central Anatolia	62,8	51,5	49,5	69,9	52,3	34,6
Western Black Sea	62,4	54,7	41,5	71,4	55,9	46,2
Eastern Black Sea	61,7	45,7	39,7	75,8	57,3	49,6
North Eastern Anatolia	43,9	30,9	26,0	66,7	47,2	38,9
Middle Eastern Anatolia	55,6	55,6	50,9	69,7	54,3	40,3
South Eastern Anatolia	51,4	41,0	30,1	65,8	57,6	46,5
Rural	53,3	41,4	34,7	66,3	52,6	43
Urban	58,6	46,4	39,4	69	50,1	38,5
Total	57,2	45,2	38,1	68,6	51	39,9

8.4 Discussion

The hyperlipidemia prevalence in the population above 15 years of age was found 12.5% according to the antihyperlipidemic medication use and LDL cholesterol ($LDL-C \geq 160$ mg/dl) values. Prevalence is 13.7% in females and 11.2% in males. In case of antihyperlipidemic medication use or $LDL-C \geq 130$ mg/dl, hyperlipidemia prevalence in males is 26.9%, in females it is 29.6%, and 28.4% in total.

According to TEKHARF study 2001 data, $LDL-C \geq 130$ mg/dl prevalence in individuals above 30 years of age is 30.5% for males and 38.1% for females (10). In this study, on the other hand, $LDL-C \geq 130$ mg/dl prevalence in 30-and-above group is 29.2% for males, 33.5% for females and 32.5% in total. Accordingly, high LDL-C prevalence was found slightly lower than TEKHARF study. In another study conducted in 2005 in the Mediterranean regions in 20-and-above age group, high LDL-C prevalence was



found 27.4% and mean LDL-C was found 110,2 mg/dl; in a study conducted in Trabzon in 20-and-above age group, mean LDL-C was found 127,5 mg/dl (Table 8.13 and 8.15). Total-C prevalences were found similar to the other studies (Table 8.13 and 8.14). Mean Total-C values increase up to 45-54 age group in males, and decreases with age in the following groups. Similarly, the increase in females up to 55-64 age group, reverses in the following age groups. A similar correlation between cholesterol levels and age groups was found; in TEKHARF study; and also it was found that the high cholesterol levels were reached earlier in males than in females. It can be thought that this decrease in cholesterol averages in older age groups might be related to high awareness and treatment levels.

Table 8.10 Dislipidemia prevalences in the population above 15, 20 and 30 years of age by sex, Turkey 2011.

	Male			Female			Total		
	n	%	%95 CI	n	%	%95 CI	n	%	%95 CI
Total Cholesterol>200									
Total age ≥15	1871	27,1	26,1-28,2	2493	31,7	30,6-32,7	4364	29,6	28,8-30,3
Total age ≥15*		25,3			29,6			27,5	
Total age ≥20	1847	30,1	28,9-31,2	2463	34,6	33,4-35,7	4310	32,5	31,7-33,3
Total age ≥30	1675	34,0	32,7-35,3	2300	40,9	39,6-42,1	3975	37,6	36,7-38,6
LDL-Cholesterol> 160									
Total age ≥15	470	7,0	6,3-7,5	638	8,2	7,6-8,8	1108	7,6	7,2-8,0
Total age ≥15*		6,4			7,6			7,0	
Total age ≥20	468	7,8	7,1-8,4	629	8,9	8,3-9,6	1097	8,3	7,9-8,9
Total age ≥30	433	8,9	8,1-9,8	601	10,8	10,0-11,6	1034	9,9	9,3-10,5
Low HDL Cholesterol									
Total age ≥15	3195	46,6	45,4-47,8	4433	56,8	55,7-57,9	7628	52,0	51,2-52,8
Total age ≥15*		46,4			56,5			51,5	
Total age ≥20	2920	47,9	46,6-49,1	4015	56,9	55,7-58,0	6935	52,7	51,8-53,5
Total age ≥30	2368	48,4	46,9-49,7	3227	57,8	56,5-59,1	5595	53,4	52,4-54,4
Triglyceride>150									
Total age ≥15	1420	20,6	19,6-21,6	943	12,0	11,3-12,7	2363	16,0	15,4-16,6
Total age ≥15*		19,9			11,2			15,5	
Total age ≥20	1382	22,6	21,4-23,5	927	13,0	12,2-13,8	2309	17,9	16,8-18,1
Total age ≥30	1194	24,3	23,1-25,5	870	15,4	14,4-16,4	2064	19,6	18,8-20,4

* Standardized using Turkey 2010 population



Table 8.11 Comparative results of High Total-C in three different studies conducted in Turkey between 2000 and 2011.

	TEKHARF	Trabzon Lipid Study	Turkey Chronic Diseases and Risk Factors Study
Age Groups	30 years and above	20 years and above	15 years and above
Date of study	2000	2008	2011
High Total-C definition	Total-C \geq 200 mg/dl	Total-C \geq 200 mg/dl	Total-C \geq 200 mg/dl
Prevalence (crude rate)	% 31,2	% 37,5	% 29,6
Comparative results			% 32,5* % 37,6**

* When Trabzon Lipid study age groups are considered

** When TEKHARF study age groups are considered

Table 8.12 Comparative results of High LDL-C in four different studies conducted in Turkey between 2000 and 2011.

	TEKHARF	Trabzon Lipid Study	METSAR	Turkey Chronic Diseases and Risk Factors Study
Age Groups	30 years and above	20 years and above	20 years and above	15 years and above
Date of study	2000	2008	2007	2011
High LDL-C definition	LDL-K \geq 130 mg/dl	LDL-K \geq 130 mg/dl	LDL-K \geq 130 mg/dl	LDL-K \geq 130 mg/dl
Prevalence (crude rate)	Male:30,5% Female:38,1%	% 44,5	%27,4	% 24,6
Comparative results				% 27,2* % 32,5**

* When Trabzon Lipid study age groups are considered

** When TEKHARF study age groups are considered

Current study shows that low HDL prevalence is a significant problem in our country. Low HDL-C prevalence in males is 46.6%, and 56.8% in females. In the study conducted in the Mediterranean region low HDL-C prevalence was found 29.5% in males and 38.5% in females (11). In another national study, low HDL-C prevalences in males and females were found 25.2% and 32.4% respectively (12). Low HDL-C prevalence is 21.1% in Trabzon Lipid Study (7). The mean HDL-C in METSAR study was found 46.3 mg/dl in males and 52.0 mg/dl in females¹³. The HDL-C mean in this study is 43.2 mg/dl in males and 50.3 mg/dl in females.

According to TEKHARF study 39.6% of males and 29.2% of females, according to METSAR 39.9% of males and 31.8% of females had high triglyceride. In the current study high triglyceride was found in 36.6% of males and 25.6% of females (10,13).



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9

Obesity





9 Obesity

Professor Belgin ÜNAL

Key Findings

- In this chapter obesity prevalence in the population above 15 years of age, which was calculated using body mass index, waist circumference and waist-hip ratios, is presented by sex, age groups, area of residence and NUTS1 regions.
- Prevalence of obesity defined as $BMI \geq 30 \text{ kg/m}^2$, 15% in males and 29% in females.
- 37% males and 29% of females are over-weighted ($BMI \text{ } 25.0 - 29.9 \text{ kg/m}^2$).
- Obesity is most prevalent in 55-64 age group for both sexes (26% in males, 57% in females).
- Prevalence of risky waist circumference in females was found approximately two times more than males (21% in males and 44% in females). Higher waist to hip ratio is more prevalent in males than in females (30% in males, 25% in females).
- While males living in urban areas have higher values for risky BMI, waist circumference and waist-hip ratio, females living in rural areas have more risky values.



9.1 Introduction

Obesity is an important public health issue with an increasing prevalence all over the world. Obesity prevalence in the world has been doubled up since 1980, and body mass index has increased 0.4-0.5 kg/m² annually (1). Obesity is an important cardio-metabolic risk factor which plays a role in the development of heart diseases and diabetes, and also hypertension and dyslipidemias are more prevalent in obese people (2). According to Framingham HeartStudy obesity increases the risk of cardiovascular disease development 1.5 times (3). Obesity prevalence in Turkey is significantly high in adults and recently it has been increasing rapidly as it is in the world. According to the nationwide TURDEP-1 study, obesity prevalence in the population above 25 years of age is 12.8% in males and 29.2% in females (4). In TURDEP-2 study, conducted in 2010, obesity prevalence was reported as 27.3% in males and 44.2% in females (5).

World Health Organization Obesity Experts Committee emphasized the importance of measuring the abdominal fat mass and the necessity of other measurement methods in addition to the BMI (6). Waist circumference measurement is an anthropometric measurement used in determining the body shape. Fat accumulation around abdomen causes more health risks than the accumulation around hips or other parts of the body. Other simple but accurate methods for this risk are waist circumference and waist-hip ratio measurements. While waist-hip ratio was found related to heart crisis, ischemic stroke and early death in males after 12 years of monitoring, this relation could not be found with BMI (7). A similar relation was found using waist circumference (2).

In this chapter the current situation of obesity in our country is presented by evaluating prevalences of high BMI, waist circumference and waist-hip ratio values in the population above 15 years of age by sex, age groups, area of residence and NUTS1 regions.

9.2 Methods and Definition

The participants were invited to the family health centre and the survey form was filled out. Also anthropometric measurements and physical examinations were conducted. Instructions for the measurement of height, weight, waist and hip circumferences of the individuals were prepared and delivered to the family physicians electronically. The height of the interviewees was measured with their feet on a hard floor, with their back of the head, their backs, hips, thighs and heels touching a straight wall, without their shoes. The height was measured in centimetres.

The platform scales which were available in every health institution were used to measure body weight. The body weight of the interviewees was measured on a hard floor, with their overweight clothes off (shoes, sweaters, jackets, bags, etc.) as kilograms.

Waist measurement was done when the interviewee is not wearing any clothes, by taking a single measurement by tape measure crossing the iliac crest as centimetres. Hip circumference was determined by measuring the largest body diameter which crosses gluteus maximus at the back and the pubis at the front, in centimetres.



Body Mass Index

BMI, which handles weight and height together, was calculated using the formula weight (kg) / height (m)². BMI is a cheap and non-invasive criterion in evaluating obesity. According to WHO, individuals with BMI < 18.5 are defined “low weighted”, BMI = 18.5-24.9 “normal weighted”, BMI = 25.0-29.9 “over-weighted” and BMI ≥ 30 are defined as “obese” (8).

Waist Circumference and Waist-Hip Ratio

BMI does not provide information about the distribution of body fat. Waist circumference and waist-hip ratio are considered better measures that determine distribution of body fat more accurately. Higher values for both of these measurements are related with increased diabetes or cardiovascular disease risks. Waist circumference above 102 cm in males and 88 cm in females are defined as “large” (9). Waist-hip ratio is derived by the division of waist circumference to hip circumference. According to the definitions of American Heart Association, males with waist-hip ratio over 0.95, and females with the ratio over 0.88 are accepted as at risk (9).

9.3 Findings

Obesity prevalence, by BMI, was found 15% in males and 29% in females. While prevalence of over-weight does not change in females, obesity prevalence increases dramatically starting from 35 years of age (Figure 9.1, 9.2). More than half of the population above 35 years of age, in both males and females, are either over-weighted or obese.

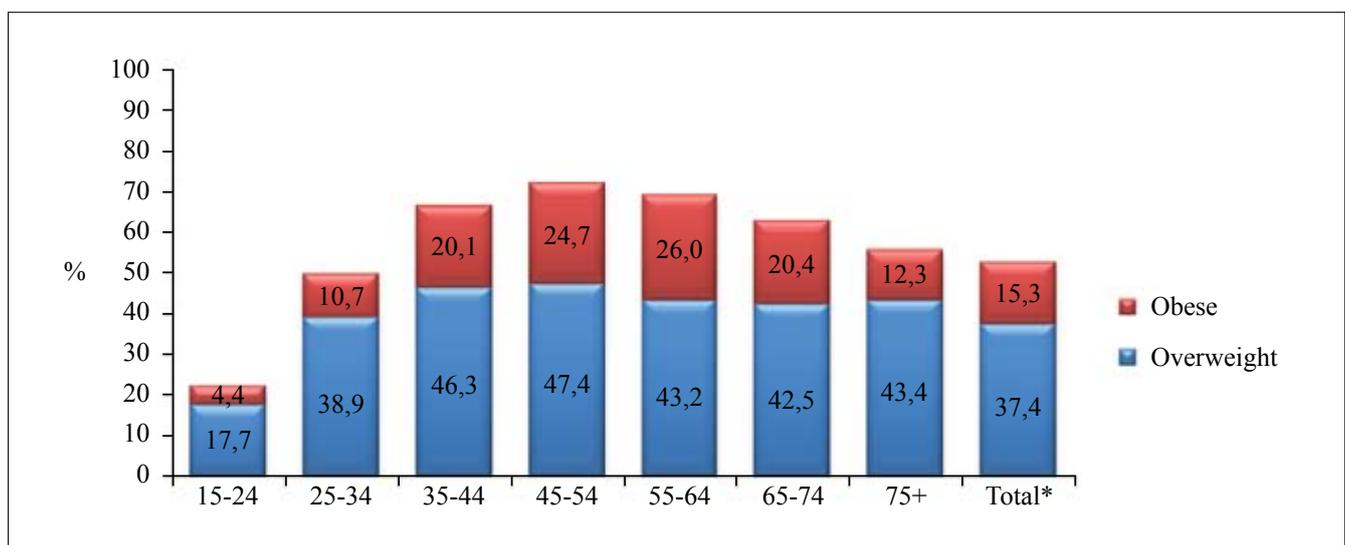


Figure 9.1 Obesity and over-weight in males by age groups, Turkey 2011.

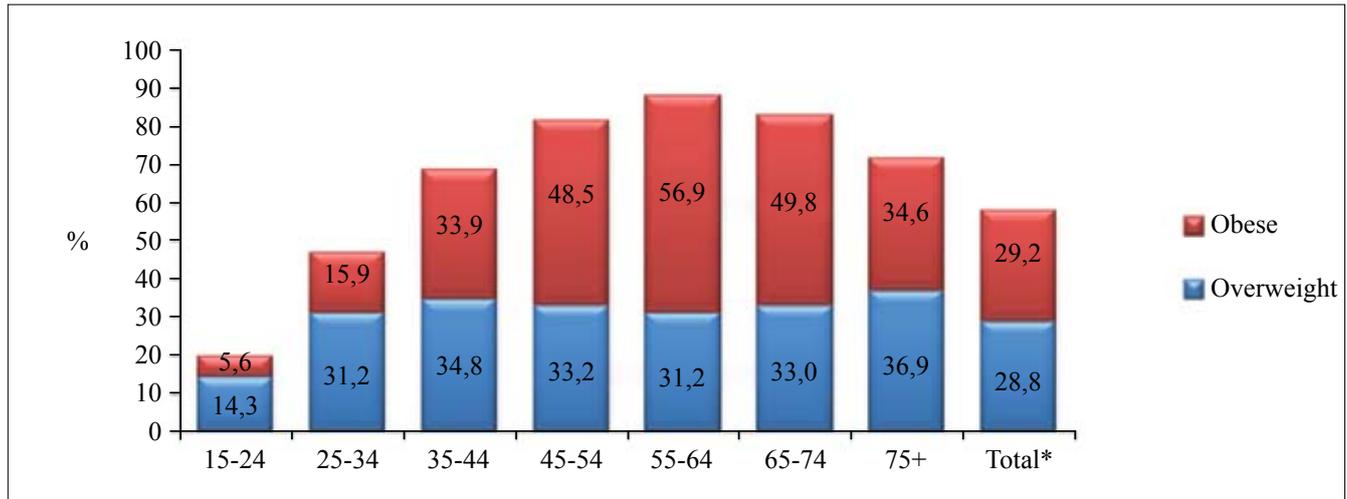


Figure 9.2 Obesity and over-weight in females by age groups, Turkey 2011.

Table 9.1 Distribution of BMI categories in males by age groups, NUTS1 Regions and area of residence, Turkey 2011.

Age Groups	Body Mass Index Categories				Total	
	Under-weight	Normal	Overweight	Obese	n	%
15-24	10,5	67,4	17,7	4,4	1581	100,0
25-34	1,8	48,6	38,9	10,7	1682	100,0
35-44	0,9	32,8	46,3	20,1	1563	100,0
45-54	0,7	27,1	47,4	24,7	1346	100,0
55-64	1,5	29,3	43,2	26	977	100,0
65-74	1,7	35,4	42,5	20,4	539	100,0
75+	2,6	41,7	43,4	12,3	309	100,0
NUTS1 Regions						
İstanbul	2,7	37,4	42,5	17,4	1489	100,0
Western Marmara	2,8	39,7	38,4	19,1	388	100,0
Aegean	3,2	42,7	37,8	16,3	1042	100,0
Eastern Marmara	3,5	43,4	36,9	16,2	795	100,0
Western Anatolia	3,2	38,2	43	15,6	723	100,0
Mediterranean	3,2	40,9	38,5	17,4	1031	100,0
Central Anatolia	3,2	44,4	35,4	17	412	100,0
Western Black Sea	2,8	40,6	39,4	17,2	505	100,0
Eastern Black Sea	0,7	41,1	39	19,2	287	100,0
North Eastern Anatolia	3,9	44,8	34,9	16,4	232	100,0
Middle Eastern Anatolia	3	53,1	32,7	11,1	397	100,0
South Eastern Anatolia	5	49,6	33,7	11,6	697	100,0
Area of Residence						
Rural	3,5	45,2	35,6	15,8	2410	100,0
Urban	2,9	40,8	39,8	16,5	5464	100,0
Total	3,2	42,1	38,5	16,2	7997	100,0
(95% CI)	(2,8-3,6)	(41,0-43,2)	(37,4-39,6)	(15,4-17,0)		
Total*	3,5	43,8	37,4	15,3		

* Standardized using Turkey 2010 population



Table 9.2 Distribution of BMI categories in females by age groups, NUTS1 Regions and area of residence, Turkey 2011.

FEMALE						
Body Mass Index Categories						
Age Groups	Under-weight	Normal	Overweight	Obese	Total	%
15-24	14,8	65,4	14,3	5,6	1680	100,0
25-34	3,7	49,2	31,2	15,9	1832	100,0
35-44	1,3	29,9	34,8	33,9	1722	100,0
45-54	0,6	17,7	33,2	48,5	1575	100,0
55-64	0,2	11,8	31,2	56,9	1029	100,0
65-74	0,3	16,8	33	49,8	588	100,0
75+	1,7	26,8	36,9	34,6	407	100,0
NUTS1 Regions						
İstanbul	4,3	36,6	29,4	29,6	1668	100,0
Western Marmara	4,9	28,7	27,5	38,9	411	100,0
Aegean	3,2	33,5	31,6	31,6	1265	100,0
Eastern Marmara	4,7	31,6	30,6	33,1	868	100,0
Western Anatolia	3,5	36	28,4	32	902	100,0
Mediterranean	3,4	36,3	30,1	30,2	1088	100,0
Central Anatolia	4,8	30,1	28,6	36,5	482	100,0
Western Black Sea	4,4	31,2	27,7	36,7	564	100,0
Eastern Black Sea	2,9	36,1	25,6	35,5	313	100,0
North Eastern Anatolia	2,7	42,3	27,7	27,3	220	100,0
Middle Eastern Anatolia	5	42,4	32,5	20,2	342	100,0
South Eastern Anatolia	5,2	42,5	28,6	23,7	709	100,0
Total	4,1	35,3	29,5	31,1	8832	100,0
Area of Residence						
Rural	3,1	33,7	30,9	32,3	2485	100,0
Urban	4,5	36,1	28,7	30,8	6196	100,0
Total	4,1	35,3	29,4	31,2	8833	100,0
(95% CI)	(3,7-4,5)	(34,3-36,3)	(28,5-30,4)	(30,2-32,1)		
Total*	4,58	37,41	28,77	29,25		

* Standardized using Turkey 2010 population

Large waist circumference prevalence was found significantly higher in females (44%) than males (21%) in each age group and in total. However, high waist-hip ratio prevalence is higher in males than females. (Figure 9.3, 9.4).

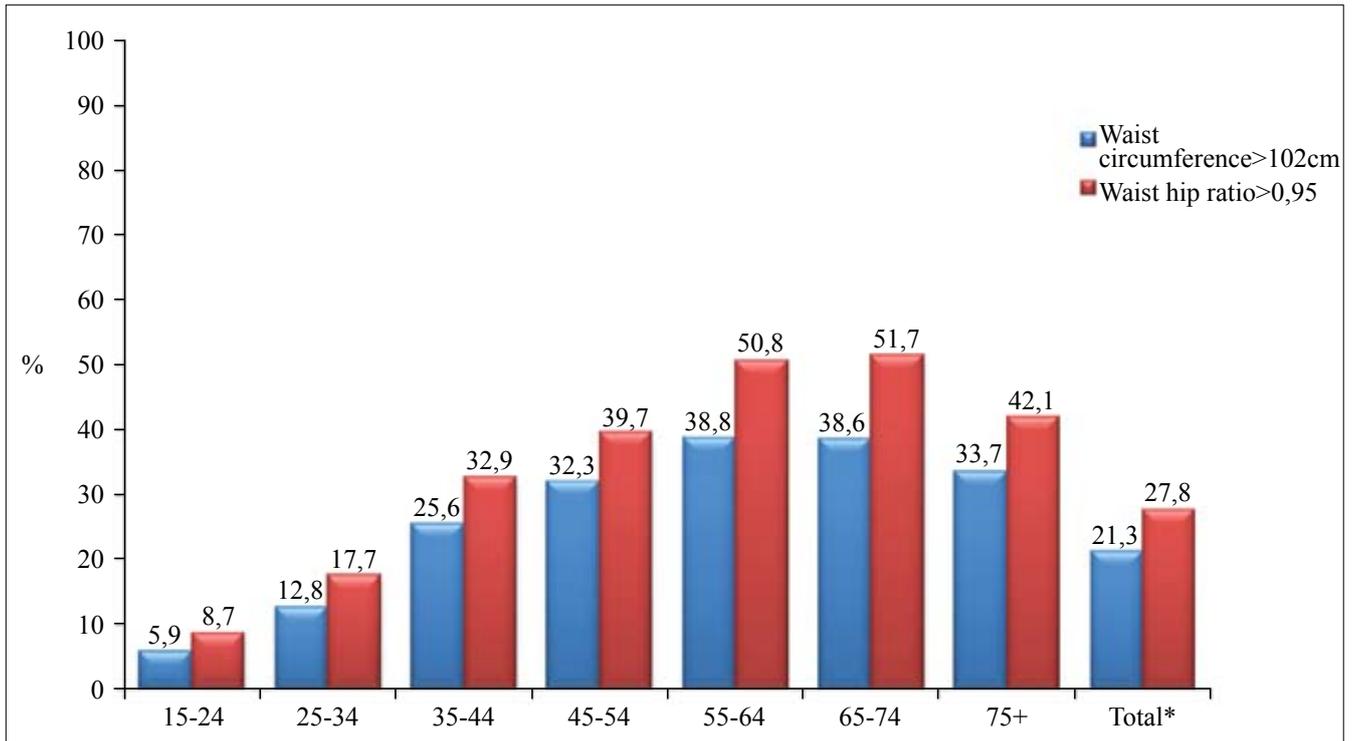


Figure 9.3 Distribution of individuals with large waist circumference and high waist-hip ratio in males by age groups, Turkey 2011.

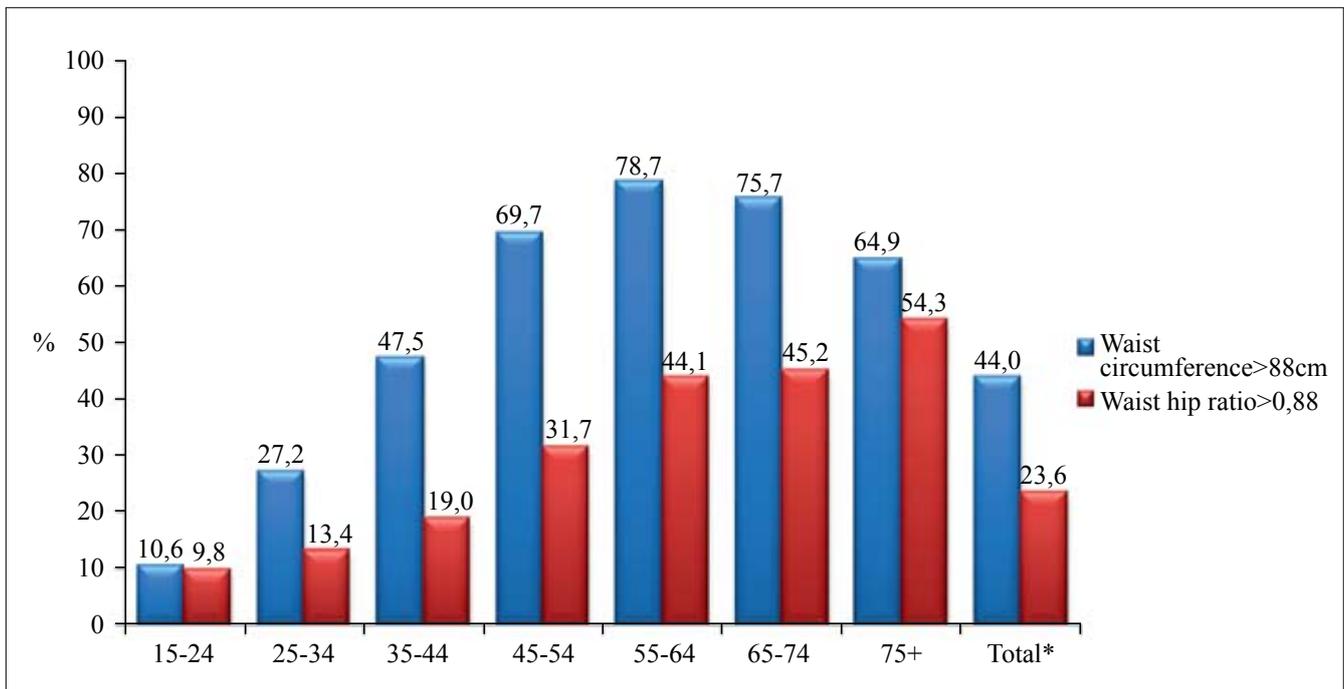


Figure 9.4 Distribution of individuals with large waist circumference and high waist-hip ratio in females by age groups, Turkey 2011.



Table 9.3 Large waist circumference and high waist-hip ratio prevalences in males by age groups, NUTS1 regions and area of residence, Turkey 2011.

Age Groups	Waist Circumference >102 cm		WHR risky	
	n	%	n	%
15-24	91	5,9	133	8,7
25-34	210	12,8	288	17,7
35-44	389	25,6	497	32,9
45-54	424	32,3	520	39,7
55-64	374	38,8	487	50,8
65-74	206	38,6	273	51,7
75+	102	33,7	125	42,1
NUTS1 regions				
İstanbul	365	25,5	423	30,0
Western Marmara	96	24,8	128	33,3
Aegean	229	22,1	323	31,3
Eastern Marmara	176	22,3	221	28,2
Western Anatolia	175	24,6	222	31,3
Mediterranean	249	24,5	314	31,0
Central Anatolia	88	21,5	110	27,1
Western Black Sea	122	24,3	163	32,6
Eastern Black Sea	72	25,1	85	29,6
North Eastern Anatolia	51	22,6	68	31,1
Middle Eastern Anatolia	68	18,1	105	28,2
South Eastern Anatolia	106	16,4	161	25,2
Area of Residence				
Rural	507	21,5	730	31,1
Urban	1264	23,7	1563	29,5
Total	1796	23,0	2323	29,9
(95% CI)		(22,0-23,9)		(29,1-31,1)
Total*		21,3		27,8

* Standardized using Turkey 2010 population



Table 9.4 Large waist circumference and high waist-hip ratio prevalences in females by age groups, NUTS1 regions and area of residence, Turkey 2011.

	Waist Circumference >88 cm		WHR risky	
Age Groups				
15-24	178	10,6	165	9,8
25-34	493	27,2	243	13,4
35-44	810	47,5	322	19,0
45-54	1085	69,7	493	31,7
55-64	807	78,7	449	44,1
65-74	439	75,7	261	45,2
75+	266	64,9	221	54,3
NUTS1 regions				
İstanbul	730	44,3	351	21,5
Western Marmara	211	51,0	111	26,9
Aegean	610	48,0	313	24,7
Eastern Marmara	409	47,3	175	20,3
Western Anatolia	432	48,2	204	22,8
Mediterranean	500	46,1	275	25,4
Central Anatolia	245	50,8	133	27,7
Western Black Sea	287	51,0	170	30,2
Eastern Black Sea	143	46,3	83	26,9
North Eastern Anatolia	99	46,5	63	29,9
Middle Eastern Anatolia	129	38,6	79	23,7
South Eastern Anatolia	282	40,6	196	28,5
Area of Residence				
Rural	1221	49,8	722	29,6
Urban	2780	45,0	1386	22,5
Total	4078	46,5	2154	24,6
(95% CI)		(45,4-47,5)		(23,7-25,5)
Total*		43,99		23,6

* Standardized using Turkey 2010 population

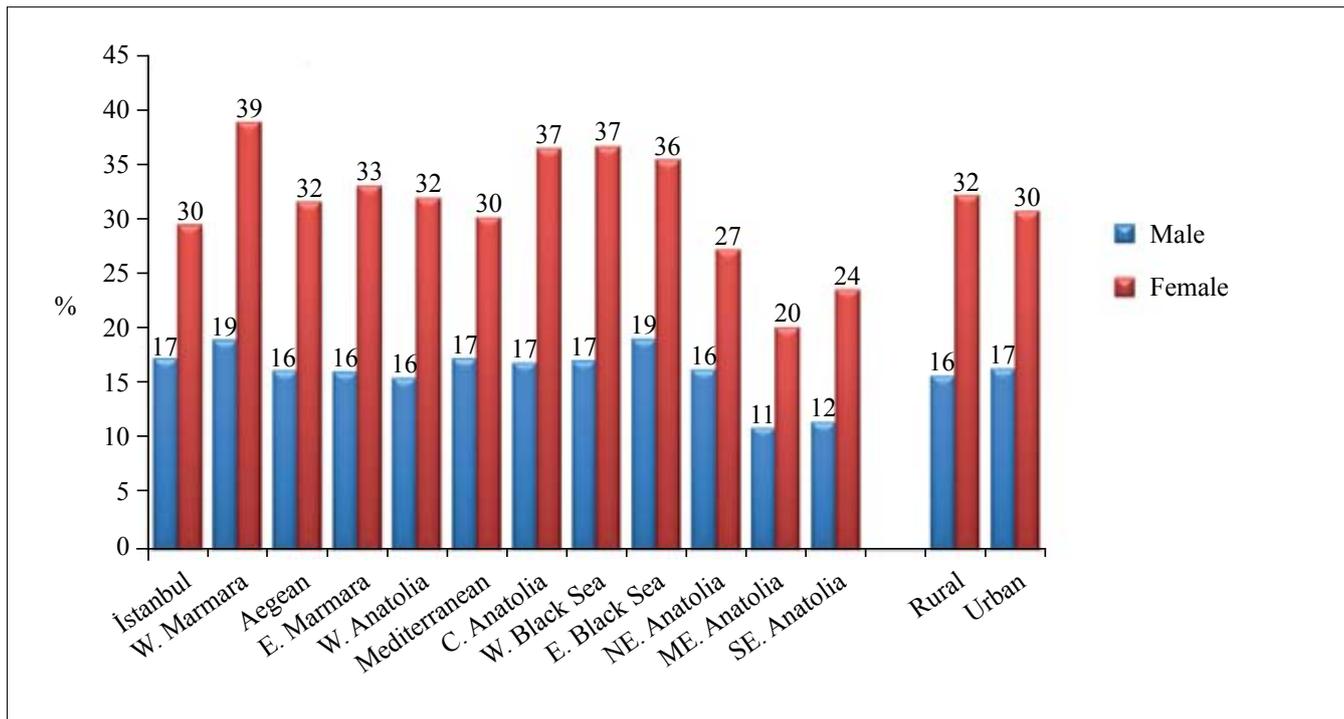


Figure 9.5 Obesity (BMI>30kg/m²) prevalence by sex and NUTS1 regions, Turkey 2011.

Obesity prevalence in females is higher than males in all NUTS1 regions. Western Marmara, Western Black Sea, Eastern Black Sea and Central Anatolia are the regions where obesity prevalence in females is significantly higher. Obesity prevalence in males does not show a significant difference between regions except for Eastern Central and South-eastern Anatolia. The regions where obesity prevalence is the lowest in males are Eastern Central Anatolia and South-eastern Anatolia regions. Obesity prevalences are similar in rural and urban areas in both sexes (Table 9.1, 9.2, Figure 9.5).

In Table 9.5 prevalence of obesity defined by BMI, waist circumference and waist hip ratio for different age groups were presented. Obesity prevalence is 17,9% in male and 34% in female over 20 years of age. High waist circumference prevalence is 50,7% in female over 20 years of age and increases to 59,5% in over 30 years of age. Obesity prevalence defined by BMI and waist circumference is two times higher in female than male however high waist hip ratio is higher in male than female. High waist hip ratio prevalence is 38,1% in male 30,4% in female over 30 years of age.

**Table 9.5 Obesity prevalence defined by BMI, waist circumference and waist to hip ratio for different age groups, Turkey 2011.**

	Male			Female			Total		
	Number	%	%95 CI	Number	%	%95 CI	Number	%	%95 CI
BMI>30									
Over 15 years	1298	16,2	15,4-17,0	2751	31,1	30,1-32,1	4049	24,1	23,4-24,7
Over 20 years	1266	17,9	17,0-18,7	2713	34,0	32,9-35,0	3979	26,4	25,7-27,1
Over 30 years	1161	20,7	19,6-21,7	2553	40,8	39,5-41,9	3714	31,3	30,4-32,1
Waist circumference “large”									
Over 15 years	1796	23,0	22,0-23,9	4078	46,5	45,4-47,5	5874	35,4	34,6-36,1
Over 20 years	1762	25,5	24,4-26,5	4008	50,7	49,5-51,7	5770	38,9	38,1-39,7
Over 30 years	1632	29,7	28,4-30,8	3691	59,5	58,3-60,7	5323	45,5	44,5-46,4
Waist / hip ratio “high”									
Over 15 years	2322	29,9	28,9-30,9	2153	24,6	23,7-25,5	4475	27,1	26,4-27,7
Over 20 years	2264	33,0	31,8-34,1	2080	26,4	25,4-27,3	4344	29,5	28,7-30,2
Over 30 years	2079	38,1	36,7-39,3	1878	30,4	29,2-31,5	3957	34,0	33,1-34,8

9.4 Discussion

In Turkey Chronic Diseases and Risk Factors Study, the prevalence of obesity above 15 years of age is found 16% in males and 31% in females. Table 9.6 is prepared for the purpose of comparison of Turkey Chronic Diseases and Risk Factors Study results and the previous studies performed in general population. As it is seen in the table, the prevalences detected in this study are generally lower than the results of previous studies.

In a nationwide study conducted on 4267 individuals above 20 years of age, obesity prevalence (BMI>30 kg/m²) was found 20.6% in males and 39.9% in females (10). In another nationwide study it was reported that over 18 years of age, 7,8% of males and 22,1% of females were obese (11). Obesity prevalence in TURDEP-1 study for males and females are 12.8% and 29.2% respectively. In TURDEP-2, conducted in 2010, obesity prevalence is 25.9% and 41.7% respectively (4).

In a study conducted on population above 20 years of age in Trabzon province, obesity prevalence was found 16.5% in males and 29.4% in females; in another study in Konya province, the prevalence was reported as 17.9% in males and 37.6% in females (12, 13). In this study, obesity prevalence in the population above 15 years of age was found 17,9% in males and 34,1% in females.

The differences observed in the prevalence of obesity among studies may be related with the design of the studies. Participation is generally low in studies in which individuals are selected as sample and were invited to health centers. A substitute is invited in case if the sample individual does not come, this results people who are “those who have health problems” or health behaviors different from sample individuals to take place in higher prevalences in the studies. This “bias” may lead to relatively higher prevalences in studies which determine the specific disease prevalence.



In previous, it was reported that obesity was more prevalent in urban areas (4,14). In this study, with a population of 20,000 or more are defined as urban places, and the prevalence of obesity was no significant difference between urban and rural areas. Rural-urban definition based on only the population is insufficient to show the differences in the chronic diseases and their risk factors. In a study with a similar definition of urban and rural areas to determine the prevalence of metabolic syndrome, similar prevalences are reported in urban and rural areas (10).

Table 9.6 Prevalence of obesity (BMI>30) in national population surveys carried out in Turkey.

	TEKHARF	TURDEP I(4)	Delibaşı T. (11)	METSAR, Oğuz A. (10)	TURDEP II(5)	Chronic Diseases and Risk Factors Study
Age group	over 20 years	over 20 years	over 18 years	over 20 years	over 20 years	over 15 years
Year and characteristics of survey	1990 Study group withdrawn from 7 regions and 32 urban, 27 rural health centers Sampling method is not probabilistic.	1997-1998 A sample was selected, rural-urban, regional population distribution taken into account. 24788 people	1999-2000 A sample was selected from 6 provinces, 3570 household. 8674 people	2006 A national rural-urban population sample 2110 male 2154 female	2010 A randomly selected sample from 15 provinces, 540 health centers. 26499 people	2011 A random sample of over 15 years of age population selected from family physicians' lists from 81 provinces. 18477 people
Prevalence of obesity (%)	Men: 12.8, Female:29.2	Men: 13.2, Female:32.9, Total:22.3	Men:7.8 Female:22.1 Total:15.6	Men:20.6 Female:39.9	Men:25.6 Female: 41.7	Men:16,2 Female: 31,1 Total: 24,1 Men*:17,9 Female*: 34,0 Total*: 26,4

* Over 20 years of age

In the METSAR study, in which abdominal obesity was defined as waist circumference >102 cm in males and >88 cm in females, 17.2% of males and 54.8% of females was found having risky values (10,15) In a study conducted in Trabzon, 18.1% of males and 38.9% of females had risky waist circumference values (13). In TURDEP-2 study the prevalence seen in urban areas was 36.5% and the 32.3% in rural areas; the prevalence for risky waist circumference were similar in urban and rural areas (5). Risky waist circumference prevalence was found lower in this study; in addition, the differences between urban and rural areas lower.

According to waist-hip ratio, another method of assessment of obesity, 27.8% of males and 23.6% of the females have high values. The prevalence of obesity defined by BMI and abdominal obesity defined by waist circumference was higher in females whereas the prevalence of obesity defined by waist-hip ratio is higher in males.

In this study, differences in prevalences of obesity between the regions are noteworthy. The prevalence of obesity defined by each of the three criteria is lower in Eastern Anatolia regions than in other regions.



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10

Metabolic Syndrome





10 Metabolic Syndrome

Dr. Melih Kaan Sözmen

Key Findings

- This chapter presents the prevalence of metabolic syndrome for males and females above 15 years of age by age groups, area of residence and NUTS1 regions.
- 23% of the participants have MS (15% in males, 32% in females).
- MS prevalence in rural and urban areas is similar, 24% and 23% respectively.
- The highest prevalence of MS was detected in Eastern Black Sea Region in males and in Western Black Sea Region in females, 19% and 39% respectively.



10.1 Introduction

Metabolic Syndrome (MS) is one of the most important risk factors of cardiovascular diseases (1). Existence of MS increases the risk of coronary heart disease risk two folds. Metabolic syndrome comprises of metabolic risk factors such as abdominal obesity, hyperglycemia or insulin resistance or type II diabetes, high blood pressure and dyslipidemia (2). Consumption of high calorie and fat-rich foods and low levels of physical activity due to modern life style increase the prevalence of MS. MS prevalence in Turkey varies between 23.7% and 32.2% in males and 38.6% and 45.0% in females in the population above 20 years of age (3,5).

This chapter presents the metabolic syndrome prevalence in population above 15 years of age by sex, age groups, area of residence and NUTS1 regions.

10.2 Methods

Metabolic Syndrome was defined using criteria suggested by International Diabetes Federation (6). According to this definition, in addition to having risky values for central obesity in waist measurements, existence of two other factors is enough for metabolic syndrome diagnosis. The risky levels for waist circumference are ≥ 102 cm in males and ≥ 88 cm in females. Other risk factors are (1) Triglycerid ≥ 150 mg/dl, (2) HDL-Cholesterol below 40 mg/dl in males and below 50 mg/dl in females, (3) blood pressure systolic >130 mmHg or diastolic > 85 mmHg or use of hypertensive medication, (4) fasting blood glucose ≥ 100 mg/dl or previous type II diabetes diagnosis.

10.3 Findings

The MS prevalence based on the IDF criteria is 15.0% in males and 31.8% in females and 23.4% in total. The highest MS prevalence in males was in age group 65-74 (28.9%), and in age group 55-64 in females (71.4%) (Figure 10.1 and Table 10.1).

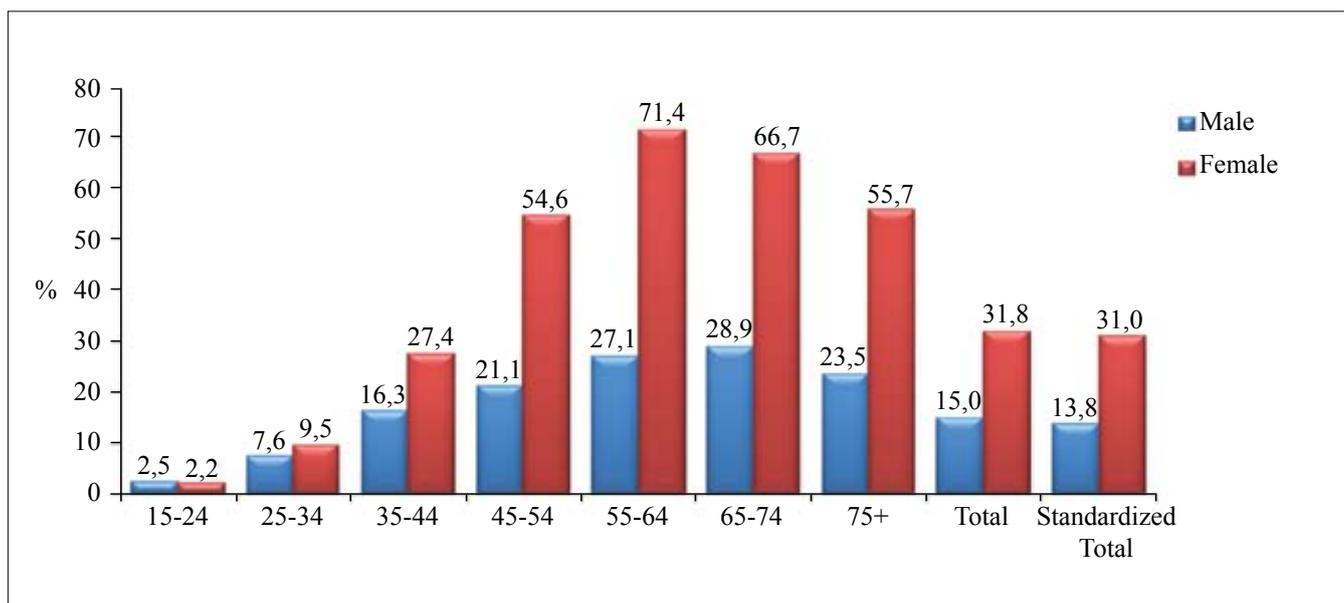


Figure 10.1 Prevalence of Metabolic Syndrome by age groups and sex, Turkey 2011.



The highest MS prevalence in males was in Eastern Black Sea region (18.6%) and in İstanbul (17.7%). In females, the highest MS prevalence was in Western Black Sea (39.2%) and Western Marmara (37.4%). While MS prevalence in males living in urban areas (15.7%) is higher than the ones living in the rural areas (13.2%), higher prevalence was found in females living in the rural areas (36.3%) than the ones living in urban areas (30.0%) (Figure 10.2).

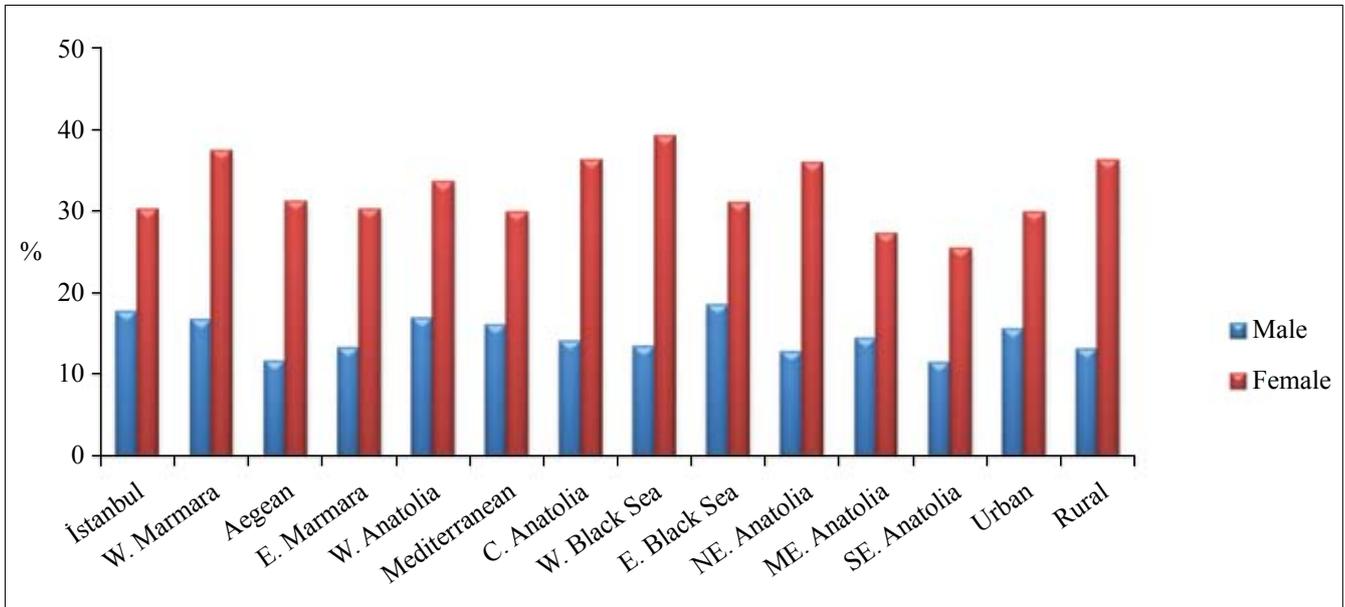


Figure 10.2 Prevalence of Metabolic Syndrome by NUTS Regions and area of residence, Turkey 2011.



Table 10.1 Metabolic Syndrome prevalence by age, sex, area of residence and NUTS1 regions, Turkey 2011.

Age Groups	Male		Female		Total				
	n	%	n	%	n	%			
15-24	30	2,5	29	2,2	59	2,4			
25-34	98	7,6	122	9,5	220	8,6			
35-44	193	16,3	317	27,4	510	21,8			
45-54	218	21,1	546	54,6	764	37,5			
55-64	204	27,1	486	71,4	690	48,1			
65-74	115	28,9	274	66,7	388	48,0			
75+	54	23,5	176	55,7	231	43,7			
Area of Residence									
Rural	235	13,2	577	36,3	812	24,0			
Urban	662	15,7	1332	30,0	1994	23,1			
NUTS1 Regions									
İstanbul	201	17,7	361	30,3	562	24,2			
Western Marmara	53	16,8	110	37,4	164	26,9			
Aegean	98	11,7	278	31,4	376	21,8			
Eastern Marmara	86	13,3	186	30,3	272	21,6			
Western Anatolia	95	16,9	220	33,7	315	25,9			
Mediterranean	130	16,2	221	30,0	351	22,8			
Central Anatolia	47	14,2	126	36,3	173	25,5			
Western Black Sea	54	13,4	166	39,2	220	26,6			
Eastern Black Sea	42	18,6	66	31,1	108	24,6			
North Eastern Anatolia	20	12,8	46	35,9	66	23,2			
Middle Eastern Anatolia	36	14,5	63	27,3	100	20,9			
South Eastern Anatolia	49	11,5	106	25,5	155	18,5			
Total for 15 + age	912	15,0	1950	31,8	2862	22,7-24,2			
		14,1-15,9		30,6-33,0	23,4				
Total for 15 + age *		13,8		30,0		22,0			
Total for 20 + age	899	16,7	15,7-17,7	1939	35,6	34,3-36,9	2838	26,2	25,4-27,1
Total for 30 + age	850	19,9	18,7-21,1	1871	44,6	43,1-46,1	2721	32,2	31,2-33,1

* Standardized using Turkey 2010 population



10.4 Discussion

Metabolic Syndrome prevalence was found 15% in males and 32% in females. Life style changes due to rapid epidemiological and socio-economic transformation in Turkey and the increase in risk factors for MS may have caused this high MS prevalence. In TEKHARF study, in 1990, MS prevalence was found 27% in males and 45% in females in 30-and-above population (7). In another study conducted in Adana in MS prevalence was found 33.4% in over 20 years of age population, 39.1% in females and 23.7% in males. In METSAR Study MS prevalence was found 33.9% in 20-and-above population (28.0% in males, and 39.6% in females) (8).

When we reanalysed the data taking the beginning age as 20 and using the Adult Treatment Panel-3 criteria used in the other study, in order to make a more accurate comparison, MS prevalences were found 30.8% in males, 38.6% in females and 35.1% in total. As for that, 2% higher prevalence was found for males, 1% lower for females and 1.2% higher for total population. In this respect the results can be considered similar. The differences between prevalences are caused by the differences in the definitions of MS.

When evaluated with regard to NUTS1 regions, the highest MS prevalence in males was found in Eastern Black Sea region (18.6%) and the lowest was found in South-eastern Anatolia with 11.5%. As for females, the highest MS prevalence was found in Western Black Sea with 39.2% and the lowest was found in Sout-eastern Anatolia with 25.5%. In METSAR study, too, the region with highest MS prevalence was Black Sea region, and the one with lowest MS prevalence was South-eastern Anatolia region (8). MS prevalence was found similar in rural and urban areas with regard to areas of residence.



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11

Nutrition





11 Nutrition

Professor Gönül DİNÇ HORASAN

Key Findings

- Whole-meal bread consumption is 11,5% in male and 15,8% in female. Whole-meal bread consumption increases by age in both sexes. Type of the bread consumed is the same in rural and urban areas. Whole-meal bread consumption is higher in İstanbul, the Mediterranean and the Aegean (ranging from 16,4% to 18,7%) and lower in Central, South-eastern and North-eastern Anatolia and Eastern Black Sea regions (ranging from 5,4% to 10,4%).
- When the type of oil/butter consumed generally is evaluated, it is seen that butter is consumed at a 7,1% proportion, margarine 3,2%, olive oil 27,6% and oils such as sunflower, corn, soy, and hazelnut 62,1%. Nine out of ten people consume olive, corn, and soy or hazelnut oil.
- One fifth of the participants add salt to meal on the table without tasting first. Approximately one fourth of young male and female declare that they add salt to the meals without tasting. Although this proportion decreases by age (approximately 10% in 65-74 age group), it increases in 75+ age group (for male and female, 17,7% and 14,1% respectively). The percentages of adding salt to the meals without tasting first are similar in rural and urban areas.
- In total 13,3% of the participants consume five or more portions of fruits or vegetables. The mean portions of fruit/vegetable per day are $2,7 \pm 0,01$ and the median is 2.
- Fruit/vegetable consumption is similar according to sex and residence. The median of fruit/vegetable consumption in the Aegean (3,1) Eastern Black Sea (3,1), Mediterranean (3,0) is higher than other regions.



11.1 Introduction

There is a growing body of evidence for a link between poor diet and illness. It is estimated that, in a global scale, almost 19% of the digestive system cancers, 31% of the ischemic heart diseases, 11% of stroke cases are related to inadequate consumption of fruits/vegetables. 2,7 millions of deaths occurring in the world each year (4.9%) and the 26,7 DALY of disease burden (1,8%) result from inadequate consumption of vegetables and fruits (1).

Since the obesity is an important public health problem in Turkey, the “Turkish Obesity Control Program” started in 2010. The name of the program has changed to “Turkey Healthy Nutrition and Active Life Program” in 2012, since it is important to encourage the physical activity along with an adequate and balanced diet to control obesity. The program aims to increase the vegetable and fruit consumption in Turkey.

According to the results of the National Household Survey, conducted by Refik Saydam National Public Health Institute, it has been found that individuals aged over 18 consume 1,64 portions of fruit and 1,57 portions of vegetables per day on average. For adequate and balanced nutrition, it is recommended by WHO that individuals should consume 400 grams of vegetables and fruits per day. The Nutrition Guide for Turkey recommends 5 portions of vegetables and fruits per day. According to the results of the surveyments above, fruit and vegetable consumption in Turkey is inadequate based on the recommended level. In the Nutrition Guide for Turkey, it is also recommended that the whole-meal bread to be consumed and saturated fats consumption to be limited (2).

In order to control hypertension which constitutes an important risk factor for cardiovascular diseases and stroke limiting salt consumption is recommended. It has been found that salt consumption is closely related to stomach cancer, osteoporosis and kidney diseases. WHO recommends that the daily consumption of salt should be <5 g/day. However, the SALTurk study conducted in Turkey shows that daily salt consumption is 18 g/day.

In the European and North American countries 70-80% of the daily salt consumption comes from the processed foods, restaurants and convenience food services and 20% from meals cooked at home and salt used at the dining table. In Turkey, on the other hand, traditional foods (pickles, brine, canned food), cheese and other processed food and the salt used in the meals and adding at the dining table is thought to build up the excess load. In order to prevent overconsumption of salt in Turkey, a “Preventing Salt Overconsumption Program and Action Plan” has been prepared. It is important to determine the ‘salty’ feeding behaviour and its time trends in Turkish community in order to assess the success of the program (3).

11.2 Methods and Definitions

Participants have been questioned how they “generally” eat in order to determine their healthy eating behaviour. With this purpose, questions were asked about what kind of bread they consume (white/whole-wheat, rye, oat), which kind of oil/butter they prefer in their meals (butter/margarine/olive oil/oils such as sunflower, corn, soy or hazelnut), and whether they add salt to the meals at the dining table without



tasting it. The amounts of daily fruit and vegetable portions were also questioned. In order to determine the fruit portions consumed, the individuals were requested to answer how many portions of fruits per day they consumed and the following explanation is supplied to calculate the fruit portion: “1 portion: 1 apple or 1 peach or 2 tangerines or 1 slice of watermelon or 1 slice of melon or 4 apricots or 6 plums or half a pomegranate or half a grapefruit or 10 strawberries”. In a similar way, in order to determine the daily vegetable consumption, the individuals were asked how many portions of vegetables per day they consumed and the following explanation is supplied to calculate the vegetable portion: 1 portion: 4 table spoons cooked vegetables, or one of vegetables such as carrots, tomatoes and artichokes, or a bowl of salad.”The individuals were requested to write “0” if they do not consume fruits of vegetables every day.

Percentage distributions of the types of bread, oil/butter consumed and adding salt without tasting the meal first were presented according to age, sex, residence (rural/urban) and NUTS1 regions. The mean, standard error of mean and median of daily number of fruit and vegetable daily portions were calculated. The data also presented as the percentage distributions of the number of fruit or vegetable portions consumed.

11.3 Findings

Among the study group, 13% (11% of male and 15% of female) consume whole-meal bread (Table 11.1, Figure 11.1). Whole-meal bread consumption is similar in rural and urban areas, and there is a higher consumption in İstanbul, the Mediterranean and the Aegean (ranging from 16.4% to 18.7%); and lower consumption in Central, South-eastern and North-eastern and Eastern Black Sea (ranging from 5.4% to 10.4%) (Table 11.2).



Table 11.1 Bread and Oil/Butter type consumed by age and sex, Turkey 2011.

	Age groups							Total	Total*
	15-24	25-34	35-44	45-54	55-64	65-74	75+		
Men	%	%	%	%	%	%	%		
Bread Type									
White	94,8	92,1	90,7	84,8	80,3	79,9	83,8	88,5	89,2
Whole-meal**	5,2	7,9	9,3	15,2	19,7	20,1	16,2	11,5	10,8
Oil/Butter Type									
Butter	8,7	5,9	8,2	6,6	7,8	9,0	12,0	7,7	7,7
Margarine	5,2	3,7	2,9	3,9	3,9	1,4	5,1	3,8	3,9
Olive Oil	23,8	24,3	24,6	29,6	32,0	33,0	36,0	27,1	26,7
Oil***	62,3	66,1	64,3	59,9	56,3	56,6	46,8	61,4	61,8
Female									
Bread Type									
White	92,5	87,6	84,6	80,0	73,7	78,8	82,9	84,2	84,7
Whole-meal**	7,5	12,4	15,4	20,0	26,3	21,2	17,1	15,8	15,3
Oil/Butter Type									
Butter	6,5	6,5	5,0	7,2	7,4	7,5	8,6	6,6	6,6
Margarine	4,1	2,6	2,1	2,5	2,1	2,7	1,8	2,7	2,7
Olive Oil	24,1	25,1	28,5	31,2	31,4	29,4	33,4	28,0	27,8
Oil***	65,3	65,8	64,4	59,1	59,1	60,5	56,1	62,7	62,9
Total									
Bread Type									
White	93,6	89,8	87,5	82,2	76,9	79,3	83,2	86,3	87,0
Whole-meal**	6,4	10,2	12,5	17,8	23,1	20,7	16,8	13,7	13,0
Oil/Butter Type									
Butter	7,5	6,2	6,5	6,9	7,6	8,2	10,1	7,1	7,1
Margarine	4,6	3,1	2,5	3,2	3,0	2,0	3,2	3,2	3,3
Olive Oil	24,0	24,7	26,6	30,4	31,7	31,2	34,5	27,6	27,2
Oil***	63,9	65,9	64,3	59,5	57,7	58,6	52,1	62,1	62,4
Number of participants	3585	3877	3596	3180	2224	1234	781	18477	

* Standardized using 2010 Population of Turkey **Whole meal bread, barley etc.

*** Oil including sunflower, corn, soy or hazelnut



Table 11.2 Bread and Oil/Butter type consumed according to area of residence and NUTS1 regions, Turkey 2011.

	Type of Bread (%)			Type of Oil/butter (%)			Number of Participants
	White	Whole-meal	Butter	Margarine	Olive oil	Other oil	
NUTS1 Regions							
Istanbul	81,3	18,7	4,3	3,8	25,2	66,6	3399
Western Marmara	86,6	13,4	1,3	2,2	28,3	68,3	866
Aegean	83,6	16,4	1,8	1,4	53,8	42,9	2581
Eastern Marmara	86,4	13,6	5,3	2,4	19,1	73,3	1783
Western Anatolia	87,5	12,5	8,0	2,7	22,5	66,8	1799
Mediterranean	83,0	17,0	4,3	1,3	34,0	60,4	2337
Central Anatolia	94,6	5,4	12,5	5,3	20,8	61,4	964
Western Black Sea	90,3	9,7	9,0	2,9	18,7	69,4	1189
Eastern Black Sea	89,6	10,4	23,0	0,8	18,0	58,2	660
North Eastern Anatolia	90,8	9,2	44,6	10,6	7,0	37,8	504
Middle Eastern Anatolia	87,7	12,3	13,0	7,0	11,2	68,8	816
South Eastern Anatolia	92,5	7,5	4,2	5,3	25,4	65,1	1579
Residence							
Rural	86,9	13,1	12,3	3,4	25,5	58,8	5335
Urban	85,9	14,1	5,0	3,2	28,5	63,3	12825
Total	86,2	13,8	7,1	3,2	27,6	62,0	18477

When the type of oil/butter consumed generally is evaluated, it is seen that butter is consumed at a 7,1% proportion, margarine 3,3%, olive oil 27,3% and oils such as sunflower, corn, soy, and hazelnut 62,4% (Figure 11.2). In other words, 89,6% of the individuals declared that they consume olive oil or oils such as sunflower, corn, soy, and hazelnut. It draws attention that the proportion of butter is higher in 75+ age group while the proportion of margarine is higher in 15-24 age group. In young and old age groups, male consumers of olive oil and other oils are 5% less compared to female, in other age groups the oil/butter consumption of male and female are similar (Table 11.1).

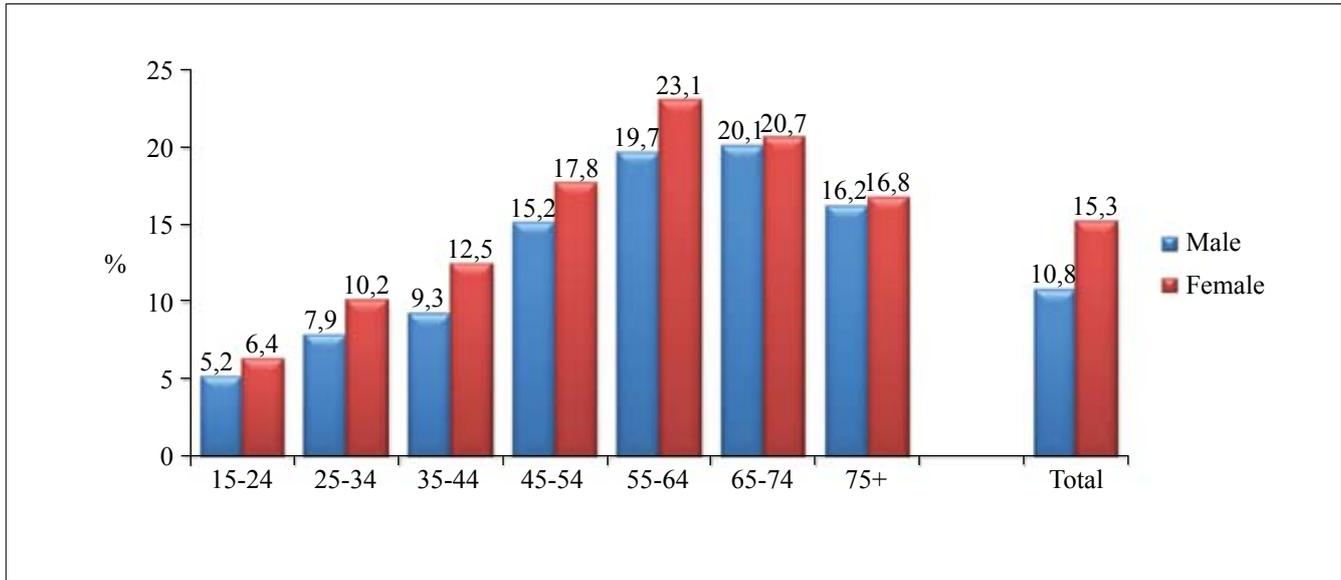


Figure 11.1 Whole-meal bread consumption according to age and sex, Turkey 2011.

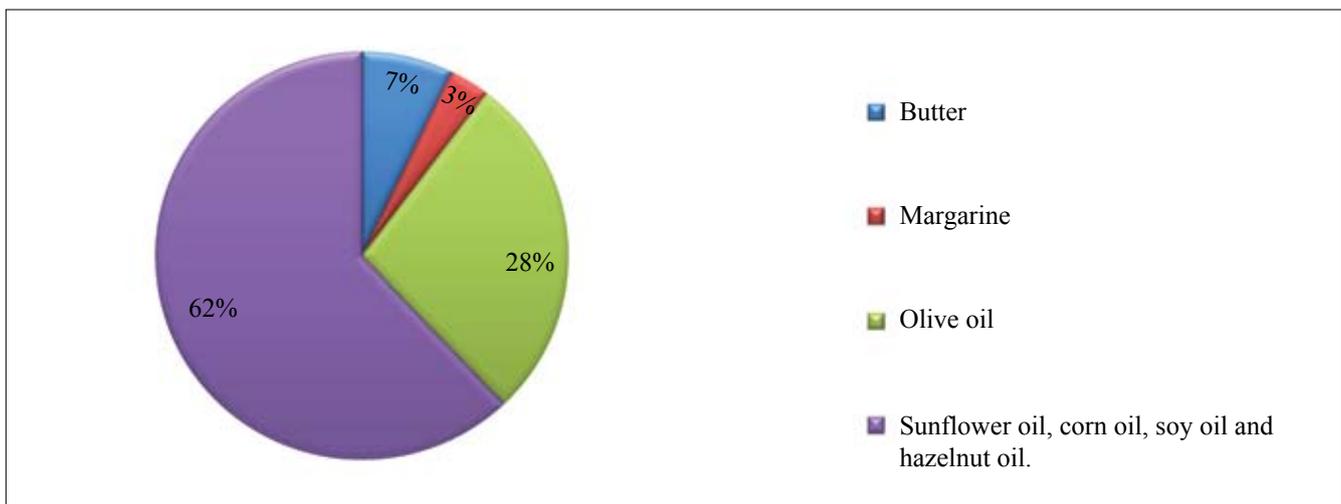


Figure 11.2 Distribution of types of oil/butter consumed, Turkey 2011.

It is remarkable that butter consumption is higher in rural areas compared to urban areas (12,3% and 5,0% respectively). It is found that butter consumption is quite common in North-eastern Anatolia and Eastern Black Sea (44,6% and 23,0% respectively), and it was also common in Central and Eastern-Central Anatolia (Table 11.2, Figure, 11.3).

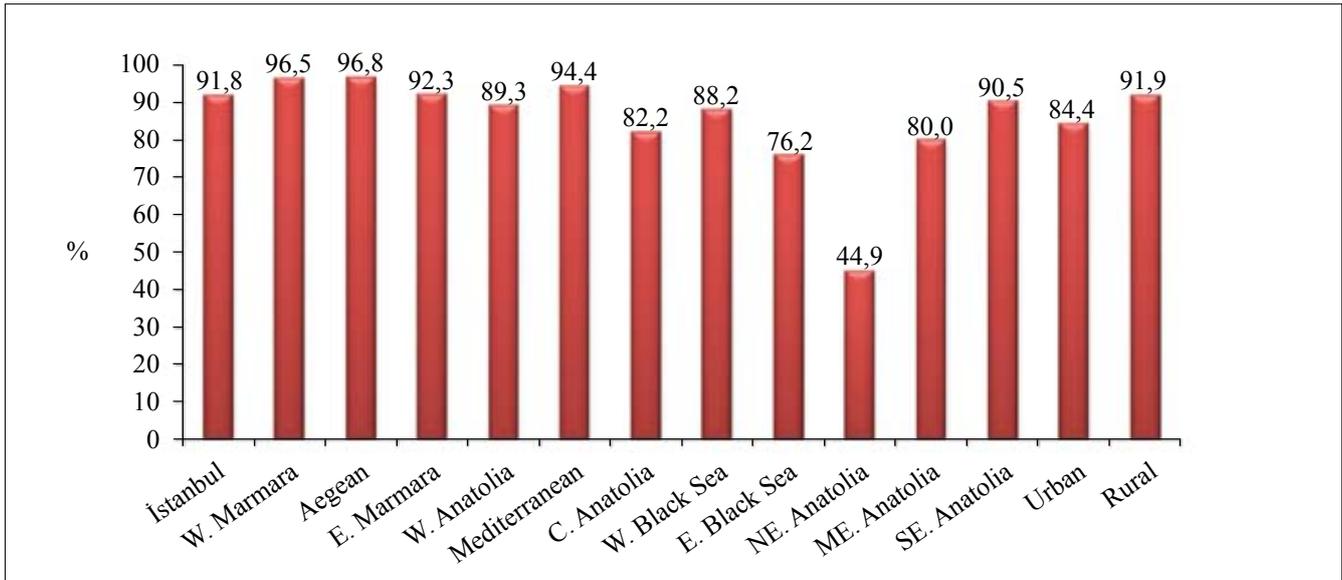


Figure 11.3 Olive oil / other oils consumption according to area of residence and NUTS1 regions, Turkey 2011.

Almost one fifth of the participants declared that they added salt to the meals without tasting it. One fourth of young male and female declared that added salt to the meals without tasting, this proportion decreases by age (approximately 10% in 65-74 age group). However, it increases in 75+ age group especially for male (Table 11.3, Figure 11.4). This behaviour which is similar in rural and urban areas, is more common in North-eastern Anatolia and Eastern-Central Anatolia (approximately 25%) and less common in the Mediterranean and Eastern Black Sea (approximately 15%) (Table 11.3).

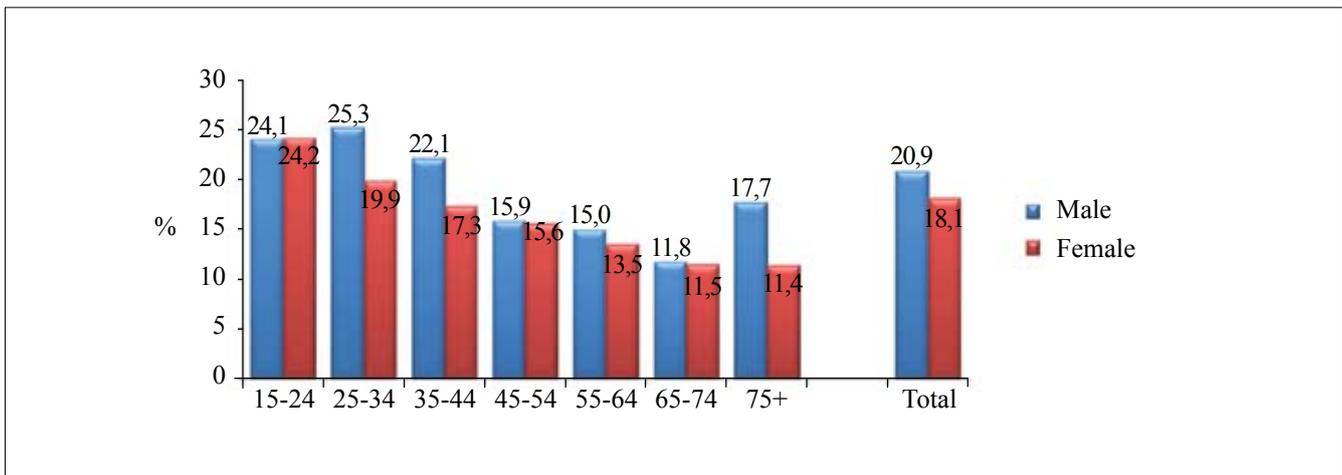


Figure 11.4 Adding salt to the meals without tasting by age and sex, Turkey 2011.

**Table 11.3 Percentage of adding salt to meals without tasting first by age groups, NUTS1 regions and area of residence in male and female, Turkey 2011.**

Adding salt to meals without tasting first						
Age	Men		Female		Total	
	n	%	n	%	n	%
15-24	408	24,1	446	24,2	854	24,1
25-34	463	25,3	396	19,9	859	22,5
35-44	372	22,1	320	17,3	692	19,6
45-54	230	15,9	264	15,6	494	15,7
55-64	160	15,0	152	13,5	312	14,2
65-74	69	11,8	73	11,5	142	11,6
75+	59	17,7	49	11,4	108	14,1
NUTS1 Regions						
İstanbul	364	23,1	377	21,1	740	22,0
Western Marmara	82	19,9	79	18,0	162	19,0
Aegean	206	17,9	245	17,6	451	17,8
Eastern Marmara	175	20,7	137	15,0	312	17,7
Western Anatolia	170	21,5	154	15,7	324	18,3
Mediterranean	189	17,0	159	13,4	348	15,1
Central Anatolia	79	17,9	94	18,6	173	18,2
Western Black Sea	107	19,3	102	16,5	209	17,8
Eastern Black Sea	55	17,4	43	12,9	98	15,1
North Eastern Anatolia	58	23,1	65	26,7	123	24,9
Middle Eastern Anatolia	107	24,5	95	25,8	202	25,1
South Eastern Anatolia	168	22,3	150	18,8	319	20,5
Area of Residence						
Rural	453	17,6	491	18,3	945	18,0
Urban	1264	21,3	1181	17,6	2445	19,3
Total	1761	20,4	1700	17,8	3461	19,0
Total*		20,9		18,1		19,5

* Standardized using Turkey 2010 population

Only 13% of the participants eat five or more portions of fruit and vegetable daily. The percentages are 4% for none, 10,4% for one portion a day, 41,3% for two portions a day, 18,5% for three portions a day, 12,6% for four portions a day). The mean of daily consumption of fruit or vegetable portions is $2,7 \pm 0,01$ and the median as 2. In both sexes the number of portions consumed increases with the age. The fruit and vegetable portions consumption of male and female are similar (Table 11.4, Figure 11.5). Consumption of fruit and vegetables are similar in rural and urban areas. The median value for daily fruit or vegetable consumption is higher in the Aegean, Eastern Black Sea and the Mediterranean compared to other regions (Table 11.5, Figure 11.6).



Table 11.4 Total number of fruit or vegetable portions a day according to age and sex, Turkey 2011

	Age groups							Total	Total *
	15-24	25-34	35-44	45-54	55-64	65-74	75+		
Male									
Daily portions ≥ 5 (%)	10.6	9.8	12.8	15.4	20.7	17.7	14.3	13.5	13.1
Mean	2.5	2.5	2.7	2.8	3.1	3.1	2.7	2.7	
$\pm S_x$	0.04	0.03	0.04	0.04	0.05	0.07	0.09	0.01	
Female									
Daily portions ≥ 5	10.9	11.1	12.5	15.3	18.4	14.1	12.0	13.2	13.1
Mean	2.6	2.6	2.8	2.9	3.0	2.9	2.7	2.8	
$\pm S_x$	0.03	0.03	0.03	0.04	0.05	0.06	0.07	0.01	
Total									
Daily portions ≥ 5	10.7	10.5	12.6	15.3	19.5	15.8	13.0	13.3	13.0
Mean	2.6	2.6	2.8	2.9	3.1	3.0	2.7	2.8	
$\pm S_x$	0.02	0.02	0.02	0.03	0.03	0.05	0.05	0.01	
Number of participants	3585	3877	3596	3180	2224	1234	781	18477	

* Standardized using Turkey 2010 population

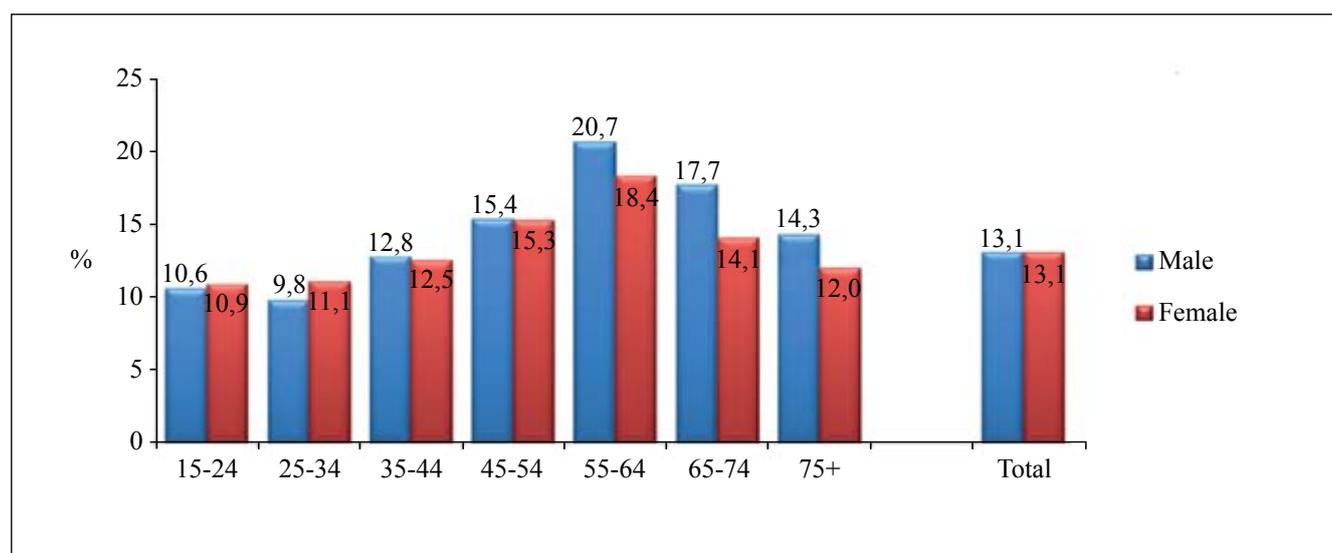


Figure 11.5 Consumption of five or more portions of fruits or vegetables by age and sex, Turkey 2011.



Table 11.5 Total number of fruit or vegetable portions a day by NUTS1 Regions and area of residence, Turkey 2011.

Total number of fruit or vegetable portions a day										
	0	1	2	3	4	≥5	Total	Mean ±s _x	Median	Number
NUTS1 Regions										
İstanbul	3,2	11,6	41,3	19,8	12,8	11,3	100,0	2,7±0,02	2,0	3399
Western Marmara	4,1	9,9	40,5	19,9	12,8	12,9	100,0	2,7±0,05	2,0	866
Aegean	2,5	7,7	35,2	21,9	15,3	17,4	100,0	3,1±0,03	3,0	2581
Eastern Marmara	3,5	10,8	36,9	19,1	14,2	15,5	100,0	2,9±0,04	2,0	1783
Western Anatolia	4,2	9,0	41,9	17,2	12,6	15,1	100,0	2,8±0,04	2,0	1799
Mediterranean	2,4	7,2	40,1	20,0	14,8	15,5	100,0	3,0±0,03	3,0	2337
Central Anatolia	5,7	14,0	45,7	15,5	8,4	10,7	100,0	2,5±0,05	2,0	964
Western Black Sea	4,1	10,9	36,1	21,3	13,8	13,8	100,0	2,8±0,04	2,0	1189
Eastern Black Sea	3,0	9,6	34,0	19,8	15,3	18,2	100,0	3,1±0,07	3,0	660
North Eastern Anatolia	11,1	12,3	53,4	9,5	8,5	5,1	100,0	2,1±0,05	2,0	504
Eastern Central Anatolia	7,5	10,5	47,0	13,8	11,7	9,4	100,0	2,5±0,05	2,0	816
South Eastern Anatolia	7,3	12,9	51,9	13,6	6,8	7,5	100,0	2,2±0,03	2,0	1579
Residence										
Rural	5,0	10,2	40,2	18,0	12,4	14,1	100,0	2,8±0,02	2,0	5335
Urban	3,7	10,2	41,2	18,8	13,0	13,1	100,0	2,8±0,01	2,0	12825
Total	4,1	10,2	41,0	18,6	12,8	13,3	100,0	2,8±0,01	2,0	18477

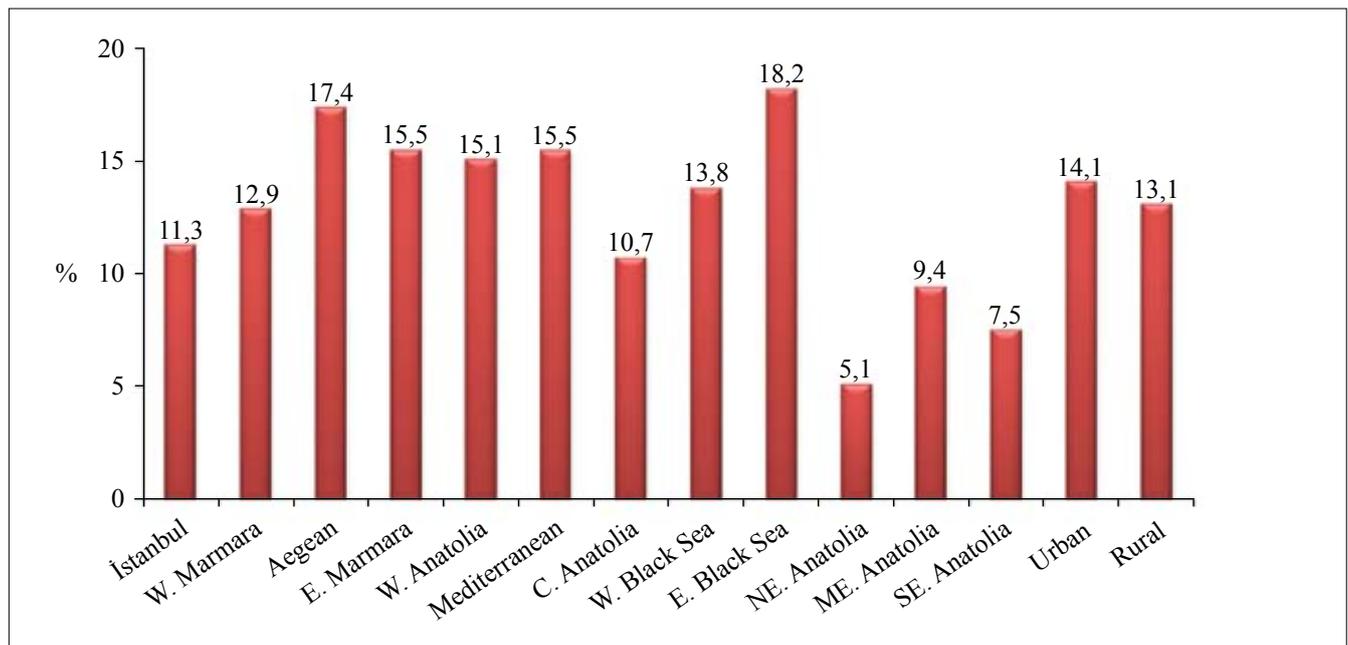


Figure 11.6 Consumption of five or more portions of fruits or vegetables by area of residence and NUTS1 Regions, Turkey 2011.



11.4 Discussion

The consumption of whole-meal bread is found very low (13%) in Turkish population. Although it is 4% higher in female than men, the consumption of whole-meal bread is very low in both sexes.

It is found that the consumption of olive oil and other oils is common. Approximately nine out of ten individuals consume various kinds of oils. In the National Food and Nutrition Strategy Work Group report, also, it has been reported that consumption of oils compared to margarine or butter increases although there had not been any substantial change in amount of oil consumption in Turkey over year (5). According to our results, margarine consumption is as low as 3.3%. However, butter and margarine consumption is very common in Eastern Black Sea, Central and Eastern-Central Anatolia and especially in North-eastern Anatolia. People living in these regions, young people and the ones over 75 (especially old men) should be the target groups for community education programme for oil consumption.

Approximately one fifth of the people declared that they add salt to the meals before tasting. The UK Health Survey in 2007 also found that adding salt to meals without tasting was common in English population (18% for male and 13% for female) (6). The decrease in salt consumption by age may be caused by having the diseases. Adding salt to the meals before tasting is more common among young age groups. However, take away food consumption is higher in younger population. A high amount of salt is added to take away food in order to prevent food deterioration. Therefore, it is of great importance to train the community about limiting salt consumption, and also limiting and controlling salt consumption with processed food.

The salt amount of bread was limited to 1,5% since July, 2011 with a regulation by The Ministry of Food, Agriculture and Livestock. The bran amount of bread was also defined with the same regulation: it should not be less than 0,65% and more than 1,5% (4). It is expected this regulation would have an impact on community level such as decreasing salt consumption and increasing whole-meal consumption. Regulations related other food, especially processed food is also necessary.

Only 13% of the participants stated that they consumed five or more portions a day. The median of total fruit or vegetable portions consumed is 2. It is also found in the National Household Survey that individuals over 18 in Turkey consumed 1,64 portions of fruits and 1.57 portions of vegetables on average (2). According to the UK Health Survey 2007, 27% of male and 31% of female in the UK consume five or more portions of fruit or vegetables a day. In England, the median for the fruit or vegetable portions consumed a day is also higher than Turkey (3,2 for men, 3,5 for female) (6). The mean portions of fruit or vegetable consumption a day in the Aegean and the Mediterranean (3.0) is even lower than the England. The median portions of fruit or vegetable consumption is quite low in North-eastern Anatolia and South-eastern Anatolia (2,1 and 2,2 respectively). The “Five Portions a Day” program, which has been conducted since 2002 in the UK, may be responsible for the higher consumption portions, besides the difference in level of welfare, when compared to Turkey (7). In Turkey, increasing fruit and vegetable consumption is also aimed with the “Turkey Healthy Nutrition and Active Life Program”. It is important to give healthy eating messages to the community using mass-media and all health staff, especially family physicians (2).



It draws attention that fruit or vegetable consumption increases as the age increases. Age and fruit or vegetable consumption relationship is similar in the English Population. Getting diet consultation with the health issues due to aging may be a reason for this trend. The information and attitude levels of the individuals about nutrition have been assessed in the UK. Despite the high levels of information in young population, fruit or vegetable consumption were found low. So, the fruit or vegetable consumption in young population is low due to their life-styles; therefore, in order to increase fruit or vegetables consumption among young people, fruit and vegetable serving/selling should be increased in dining halls, school canteens, and fast food restaurants (6).

It is found that unhealthy eating behaviour is more common in North-eastern Anatolia, Central Anatolia, Easter-Central Anatolia and South-eastern Anatolia. Although fruit or vegetables consumption in Eastern Black Sea is higher compared to the regions mentioned, other eating behaviour data are not satisfactory. It may be suggested that in addition to the education programs and guidance about healthy eating in Turkey (especially in these regions), precautions to increase the access to healthy foods should be taken.



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12

Physical Activity





12 Physical Activity

Professor Gönül DİNÇ HORASAN

Key Findings

- Among male, 23% meets recommended activity level, 22% have “moderate” activity level and 55% have “low” activity level in leisure times. These percentages are 13%, 18% and 69% respectively in female. The proportion of adults that met recommended level of leisure time activity decrease with age in both sexes.
- Almost half of male and female stated that they spent more than 4 hours a day by watching TV or using a computer. Male spend more time on using a computer, compared to female. Time spent on watching TV is higher in female than men.
- Almost a quarter of male and one-fifth of female climb up the stairs for five or more floors a day.
- A very small proportion of the employed individuals (6% in male and 9% in female) walk at least 30 minutes to their workplace.
- Occupational activity in male is higher than female. Two out of ten employed male have moderate physical activity and three out of ten have vigorous physical activity. 10% of employed female have moderate physical activity and 18% have vigorous physical activity.
- The percentage of people who have increased physical activity in the last six months (8%) and the percentage who intent to increase physical activity (approximately 40%) were quite similar in male and in female.
- Physical activity level (leisure time activity, climbing stairs, walking to workplace and occupational activities) is lower in female, in older age groups, in urban areas. There is no difference in physical activity levels between the NUTS1 regions.



12.1 Introduction

Inadequate physical activity is an important public health issue. WHO estimated that physical inactivity is responsible for 1.9% of the deaths in the world and the 19 million DALY of the burden of disease. Physical inactivity is also responsible for the 10% to 16% of breast cancer, colon cancer, rectum cancer and Type II diabetes, and for the 22% of ischemic heart diseases in the world. According to WHO estimates, 8% to 16% of the burden of disease in Turkey is due to inadequate physical activity. It is reported that global prevalence of physical inactivity is 17% (range between 11% and 24% in WHO regions); and the prevalence of some but insufficient activity (<2.5 hours per week of moderate activity) is 41% (range between 31% and 51% in WHO regions) (1). According to the results of National Burden of Disease Study conducted in 2000-2004 in Turkey, 4.3% of the disease burden could be prevented if the physical activity levels were adequate (2).

Increasing physical activity is an important target in the National Health Policy in Turkey. The National Obesity Prevention Program has been published in February 2010 and the name of the program was changed to “Turkey Healthy Nutrition and Active Life Program”, since it contains interventions to ensure adequate and balanced nutrition in the control of obesity, as well as it contains interventions to increase physical activity levels in the community. In order to evaluate the effectiveness of this program, having information on the physical activity levels in Turkish community is important (3).

Different definitions have been used in evaluating the physical activity levels of Turkish people in the studies conducted in Turkey. However, all studies show that the physical activity levels are low in Turkish community. In the “Let’s eat healthy, Let’s protect our Heart” study conducted by the Ministry of Health on 15.468 individuals over 30 years, it was found that the percentage of the individuals who had regular physical activity was just about 3.5% (4). In the National Burden of Disease study, it was found that 20% of the participants had a sedentary life, and 16% of them had inadequate physical activity (3). In the “Balçova’s Heart Study” conducted in İzmir, it was found that almost two-thirds of male and five-sixth of female had moderate physical activity (5); in another study conducted in Antalya it was found that almost half of the residents of an urban districts, and one-third of the residents of the slum districts had physical exercises in leisure time (6). There are no current national data on the physical activity levels of Turkish population. In this study physical activity levels is evaluated.

12.2 Methods and Definitions

Physical Activity Levels

There is no common international definition to evaluate the physical activity levels. In most of the studies, the leisure time activities are questioned, and in some studies in addition to the leisure time activity, home activities, activity for transportation and occupational activities are also questioned (1, 7). In order to evaluate the total physical activity levels of the people, quite detailed information about activities in leisure time, at home, for transportation and at workplace are collected and the total physical activity levels are found gathering the information together. This kind of evaluation can be used in special-purpose studies since this kind of questionnaires are quite long (7). In this study, a small number of questions about



physical activity were included in the questionnaire as there were other questions about other chronic diseases and risk factors also. The physical activity levels of individuals were evaluated separately for leisure time, home activities, transportation and occupational activities. The physical activity questions used in the survey and the evaluation are explained below.

Leisure Time Physical Activity Levels

Self reported physical activity levels in the leisure time were asked. Information about intensity, duration and frequency of the physical activities were collected. People were asked if they do moderate or vigorous physical activities. Individuals were asked if they had physical activities, sports or leisure activities that last at least 10 minutes which increase their heart beat or breathing *moderately* (activities such as *walking, gardening, cycling*), and if they had how many days a week and how many hours a day. Individuals were also asked if they had physical activities, sports or leisure activities that last at least 10 minutes which increase their heart beat or breathing *vigorously* (activities such as *running, walking quickly, swimming, jumping*) and if they had, how many days a week and how many hours a day.

Physical activity level in leisure time is classified based on the information of moderate or vigorous activity level questions as follows:

Meets recommendations: Moderate or vigorous activity of at least 30 minutes duration per day in total, on at least five of the seven days.

Moderate activity: 30 minutes or more of moderate or vigorous activity on one to four days.

Low activity: lower levels of activity (7). During data analysis a common error was noted in the data of physical activity duration, therefore only intensity and frequency were considered for the classification of the leisure time activities in this survey. Therefore moderate or vigorous physical activity at least five times a week was defined as “*Meets recommendations*” activity level; moderate or vigorous physical activity 1 to 4 times a week was defined as “moderate” activity level; and moderate or vigorous physical activity less than one time a week or no physical activity was evaluated as “low” activity level. Due to this change in definition which did not take duration of the activity into consideration, leisure time physical activity could have been estimated higher than actual.

Home Activities

How many floors had the individuals climbed up stairs were questioned and the explanation “1 floor = 10 steps of stairs” was added to the questionnaire. In order to estimate the sedentary duration spent at home, “time spent watching TV and using a computer” was asked.



Physical Activity Levels For Transportation

Employed participants were asked whether they walked to work or not; if they walked whether the duration was more or less than 30 minutes.

Occupational Physical Activity

Eight expressions related occupational physical activities were asked and the subjects were requested to select one of the appropriate answers among “never”, “seldom”, “sometimes”, “frequently”, “always” according to physical activity level during their work. The expressions related occupational physical activities were: “I generally work sitting”, “I work standing”, “I am very physically active during work”, “I need to lift heavy loads” “I feel very tired after work”, “I am physically active enough to sweat during work”, “I do physical activities, that last at least 10 minutes which increase my heart beat or breathing ***vigorously***, at my workplace (*activities such as running, walking quickly swimming, jumping*)”, “I do physical activities, that last at least 10 minutes which increase my heart beat or breathing ***moderately*** (*activities such as walking, gardening, cycling*)”.

Change in Physical Activity Levels in The Last Six Months and Intention to Increase Physical Activity Levels

The participants were asked “if they changed their physical activity levels in the last six months” and “whether they intent to increase physical activity levels”.

12.3 Findings

Leisure Time Physical Activity Levels

Among men, 23% meets recommended activity level, 22% have “moderate” activity level and 55% have “low” activity level in leisure times. These percentages are 13%, 18% and 69% respectively in female. In both sexes, the proportion of adults that meets recommended activity level and in the “moderate” activity level decrease with age. Of the people over 65 years, 81% of the male and 88% of the female do not meet recommended activity level. Among the subjects over 75 years, 85% of the male and 95% of the female do not meet recommended activity level (Table 12.1, Table 12.2 and Figure 12.1). The proportion of participants meeting the physical activity recommended is higher in rural areas than urban areas, and in Eastern Black Sea and Western Black Sea regions compared to other NUTS1 Regions.



Table 12.1 Self-reported leisure time activity levels in male by age, area of residence and NUTS1 regions, Turkey 2011.

	Self-reported activity levels(%)				Number of Participants
	Meets recommendations	Moderate activity	Low activity	Total	
Age groups					
15-24	27,3	28,6	44,1	100,0	1661
25-34	23,2	22,4	54,4	100,0	1751
35-44	21,8	20,8	57,4	100,0	1607
45-54	20,7	19,2	60,0	100,0	1394
55-64	22,0	21,4	56,6	100,0	1018
65-74	21,1	20,4	58,4	100,0	563
75+	14,2	10,3	75,5	100,0	310
NUTS1 Regions					
İstanbul	21,0	22,7	56,3	100,0	1531
Western Marmara	26,2	18,6	55,1	100,0	381
Aegean	24,9	19,0	56,1	100,0	1108
Eastern Marmara	22,9	24,1	53,0	100,0	808
Western Anatolia	19,6	22,3	58,2	100,0	772
Mediterranean	23,1	24,3	52,6	100,0	1073
Central Anatolia	24,9	20,1	54,9	100,0	417
Western Black Sea	24,1	18,9	57,0	100,0	523
Eastern Black Sea	25,8	27,8	46,4	100,0	306
North Eastern Anatolia	21,7	23,4	54,9	100,0	244
Middle Eastern Anatolia	22,7	27,6	49,6	100,0	409
South Eastern Anatolia	20,5	19,3	60,2	100,0	732
Area of residence					
Rural	26,2	20,6	53,2	100,0	2438
Urban	21,3	23,0	55,7	100,0	5720
Total	22,7	22,1	55,2	100,0	8304
Total*	23,0	22,5	54,5		

* Standardized using Turkey 2010 population



Table 12.2 Self-reported leisure time activity in female by age, area of residence and NUTS1 regions, Turkey 2011.

	Self-reported activity levels(%)			Total	Number of Participants
	Meets recommendations	Moderate activity	Low activity		
Age groups					
15-24	13,6	21,2	65,1	100,0	1730
25-34	12,5	17,1	70,4	100,0	1861
35-44	15,8	16,7	67,4	100,0	1751
45-54	14,6	18,5	66,9	100,0	1577
55-64	13,2	17,1	69,7	100,0	1058
65-74	10,1	14,0	75,8	100,0	592
75+	5,2	9,6	85,3	100,0	407
NUTS1 Regions					
İstanbul	12,8	17,8	69,3	100,0	1693
Western Marmara	17,7	15,9	66,4	100,0	402
Aegean	14,7	18,0	67,2	100,0	1302
Eastern Marmara	16,7	17,1	66,2	100,0	858
Western Anatolia	11,3	17,1	71,7	100,0	950
Mediterranean	11,4	19,4	69,2	100,0	1103
Central Anatolia	10,5	17,5	72,0	100,0	446
Western Black Sea	19,1	18,0	62,9	100,0	577
Eastern Black Sea	18,1	24,9	57,0	100,0	309
North Eastern Anatolia	13,3	15,0	71,7	100,0	233
Middle Eastern Anatolia	9,8	17,0	73,3	100,0	348
South Eastern Anatolia	8,2	12,5	79,3	100,0	754
Area of residence					
Rural	16,7	17,2	66,1	100,0	2502
Urban	12,0	17,8	70,2	100,0	6319
Total	13,3	17,5	69,2	100,0	8976
Total*	13,3	17,6	69,1		

* Standardized using Turkey 2010 population

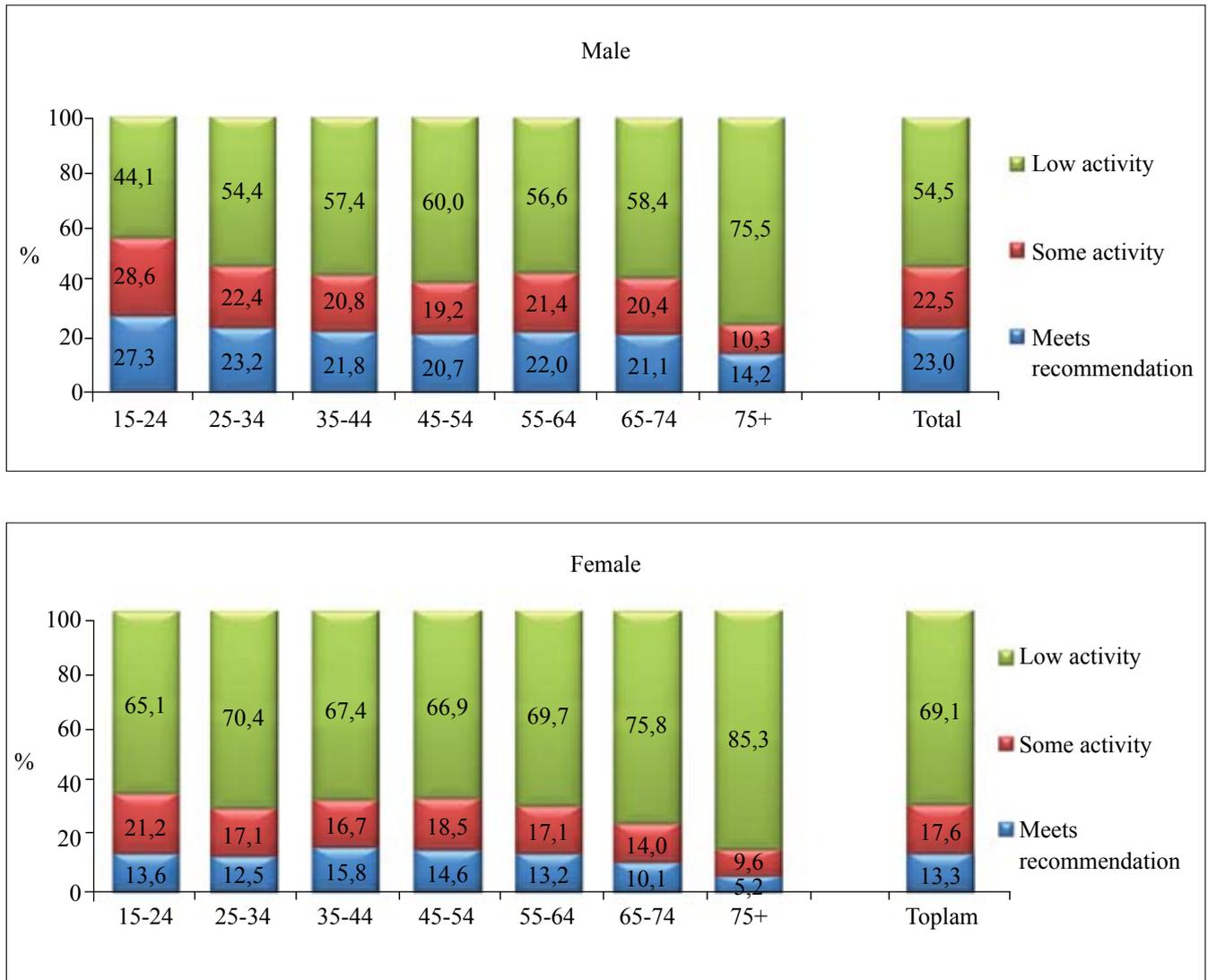


Figure 12.1 Self-reported leisure time activity levels by age and sex, Turkey 2011

Almost half of male and female stated that they spent more than 4 hours a day for watching TV or using a computer. Male spend more time for using a computer, compared to female. Time spent for watching TV is higher in female than men. The time spent for watching TV increases with age in men; it is common among female in all age groups. The time spent for using a computer decreases with age. Time spent for watching TV or using a computer is similar in both sexes; however younger age groups spend more time on watching TV or using a computer than the older population (Table 12.3, Table 12.4, Figure 12.2).

The time spent on watching TV or using a computer is higher in urban areas than rural areas, and it is higher in İstanbul, Western Anatolia, Eastern Marmara than other regions (Table 12.5).



Table 12.3 Sedentary time per day (time spent watching TV or using a computer) in male by age, Turkey 2011.

	Age Groups							Total	Total*
	15-24	25-34	35-44	45-54	55-64	65-74	75+		
Sedentary time									
Watching TV									
<2 hours	41,1	34,2	28,0	23,7	20,5	23,1	29,6	30,0	30,9
2-3,9 hours	40,6	46,7	50,7	49,1	43,3	43,4	31,5	45,5	45,4
≥4 hours	18,3	19,1	21,3	27,1	36,2	33,5	38,9	24,5	23,7
Mean	2,22	2,40	2,55	2,93	3,32	3,24	3,39	2,69	
±S _x	0,05	0,05	0,05	0,06	0,08	0,12	0,17	0,02	
Median	2,00	2,00	2,00	2,00	3,00	3,00	3,00	2,00	
Using a computer									
<2 hours	48,1	62,4	73,8	82,4	93,0	93,9	99,6	71,9	70,3
2-3,9 hours	29,9	17,8	12,5	7,8	3,8	1,9	,4	14,3	15,3
≥4 hours	22,0	19,8	13,7	9,8	3,2	4,2	0,0	13,7	14,5
Mean	2,33	2,12	1,46	0,99	0,47	0,65	0,03	1,48	
±S _x	0,07	0,08	0,07	0,06	0,06	0,14	0,01	0,03	
Median	2,00	1,00	0,00	0,00	0,00	0,00	0,00	0,00	
Total sedentary time									
<2 hours	11,2	13,0	15,8	17,2	18,7	22,1	28,9	15,8	15,3
2-3,9 hours	35,9	38,7	42,2	42,6	40,0	40,2	31,4	39,5	39,3
≥4 hours	52,9	48,3	42,0	40,2	41,3	37,7	39,7	44,7	45,4
Mean	4,44	4,37	3,89	3,82	3,73	3,79	3,40	4,04	
±S _x	0,08	0,08	0,08	0,09	0,10	0,20	0,17	0,04	
Median	4,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00	

* Standardized using Turkey 2010 population



Table 12.4 Sedentary time per day (time spent watching TV or using a computer) in female by age, Turkey 2011.

	Age groups							Total	Total*
	15-24	25-34	35-44	45-54	55-64	65-74	75+		
Sedentary time									
Watching TV									
<2 hours	24,7	25,1	24,7	24,3	25,8	27,2	35,7	25,5	25,5
2-3,9 hours	38,6	40,4	44,4	38,9	38,9	33,3	32,4	39,6	39,5
≥4 hours	36,7	34,5	30,9	36,7	35,2	39,5	31,9	34,9	34,9
Mean	3,35	3,28	2,99	3,30	3,27	3,54	2,98	3,24	
±S _x	0,07	0,06	0,06	0,07	0,08	0,14	0,17	0,03	
Median	3,00	3,00	2,00	3,00	3,00	3,00	2,00	3,00	
Using a computer									
<2 hours	65,8	80,9	86,4	93,5	96,9	98,2	98,9	84,7	84,1
2-3,9 hours	19,6	8,2	6,1	3,8	2,0	,8		7,8	8,2
≥4 hours	14,6	10,9	7,5	2,8	1,1	1,0	1,1	7,5	7,7
Mean	1,56	1,25	0,88	0,42	0,22	0,23	0,26	0,87	
±S _x	0,06	0,07	0,06	0,05	0,05	0,09	0,13	0,03	
Median	1,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	
Total sedentary time									
<2 hours	11,1	15,5	18,2	21,7	25,3	26,8	35,9	19,0	18,7
2-3,9 hours	30,4	36,2	40,9	36,7	37,8	32,8	31,8	35,8	35,6
≥4 hours	58,5	48,3	40,9	41,7	36,9	40,4	32,3	45,2	45,8
Mean	4,76	4,38	3,75	3,66	3,45	3,72	3,18	4,00	
±S _x	0,08	0,09	0,08	0,09	0,10	0,17	0,22	0,04	
Median	4,00	3,00	3,00	3,00	3,00	3,00	2,00	3,00	

* Standardized using Turkey 2010 population



Table 12.5 Sedentary time per day (time spent watching TV and using a computer) by area of residence and NUTS1 regions, Turkey 2011

	Time spent watching TV and using a computer (hours)			Number of Participants
	≥4 hours	Mean± S _x	Median	
NUTS1 Regions				
İstanbul	51,2	4,50±0,06	4,00	3287
Western Marmara	41,5	3,79±0,11	3,00	812
Aegean	43,0	3,83±0,07	3,00	2455
Eastern Marmara	45,8	4,23±0,10	3,00	1693
Western Anatolia	50,4	4,21±0,08	4,00	1694
Mediterranean	41,1	3,83±0,07	3,00	2202
Central Anatolia	41,9	3,84±0,12	3,00	895
Western Black Sea	40,7	3,76±0,10	3,00	1092
Eastern Black Sea	40,8	3,75±0,14	3,00	623
North Eastern Anatolia	39,0	3,74±0,18	3,00	466
Middle Eastern Anatolia	39,7	3,70±0,14	3,00	779
South Eastern Anatolia	46,2	3,90±0,08	3,00	1469
Area of residence				
Rural	34,9	3,33±0,05	3,00	4968
Urban	48,8	4,30±0,03	3,00	12209
Total	44,9	4,02±0,03	3,00	17467

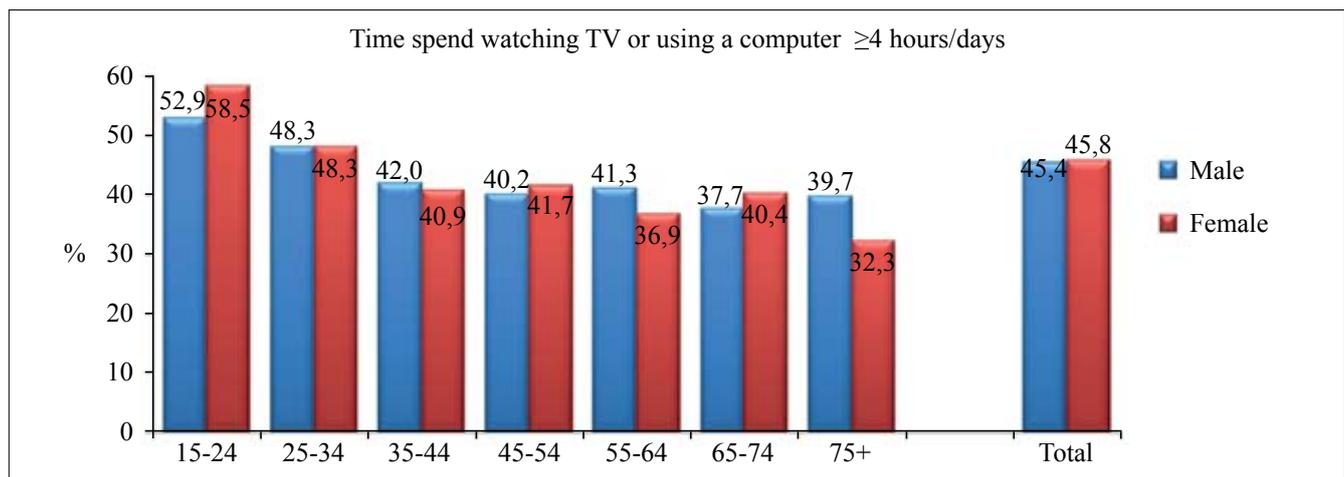


Figure 12.2 Sedentary time per day (time spent watching TV and using a computer) by age and sex, Turkey 2011



Almost a quarter of male and one-fifth of female climb up the stairs for 5 or more floors a day. Percentage of climbing up the stairs decreases with age both in male and female. Climbing up the stairs is higher in male in urban areas. In both sexes, climbing up the stairs behaviour is similar according to area of residence and NUTS1 regions (Table 12.6, Table 12.7 and Figure 12.3).

Table 12.6 The proportion of climbing stairs and walking to workplace in male by age, NUTS1 regions and area of residence, Turkey 2011.

Age groups	How many floors do you climb up the stairs a day?				How do you go to work?		
	0	1-2 floors	3-4 floors	≥5 floors	Walking (<30 min)	Walking (≥30 min)	Other
15-24	14,0	34,9	22,0	29,1	19,8	5,0	75,2
25-34	12,4	33,9	25,6	28,1	18,9	3,2	77,9
35-44	13,2	35,6	22,5	28,7	19,1	4,5	76,5
45-54	17,7	36,5	23,1	22,8	22,6	7,4	70,0
55-64	19,3	41,9	18,7	20,0	22,9	9,7	67,4
65-74	20,4	45,4	18,1	16,1	21,7	9,6	68,7
75+	36,4	43,8	9,1	10,8	10,7	25,0	64,3
NUTS1 Regions							
İstanbul	9,4	30,5	29,4	30,8	16,9	3,4	79,7
Western Marmara	21,6	35,5	21,3	21,6	19,5	6,6	73,9
Aegean	19,3	37,9	20,7	22,0	22,5	5,7	71,8
Eastern Marmara	12,8	33,9	25,6	27,7	14,5	4,0	81,5
Western Anatolia	13,4	37,9	20,7	27,9	12,0	5,2	82,8
Mediterranean	17,0	41,2	19,4	22,4	20,3	4,3	75,4
Central Anatolia	20,0	38,7	17,0	24,4	19,7	5,9	74,4
Western Black Sea	15,6	42,9	20,0	21,5	24,5	5,7	69,7
Eastern Black Sea	11,8	41,9	20,6	25,7	28,3	5,7	66,0
North Eastern Anatolia	34,1	39,1	14,5	12,3	29,4	5,6	65,1
Middle Eastern Anatolia	19,3	31,3	18,6	30,8	30,6	9,6	59,8
South Eastern Anatolia	19,1	41,8	17,9	21,2	24,5	7,9	67,5
Area of residence							
Rural	25,2	44,3	12,0	18,5	26,6	9,0	64,4
Urban	12,1	34,0	26,0	27,9	17,2	3,9	78,9
Total	16,0	37,0	21,9	25,1	20,0	5,2	74,8
Total *	15,6	36,6	22,2	25,6	20,0	6,2	73,8
Number of Participants	1283	2968	1759	2017	961	252	3594

* Standardized using Turkey 2010 population



Table 12.7 The proportion of climbing stairs and walking to workplace in female by age, NUTS1 regions and area of residence, Turkey 2011.

Age groups	How many floors do you climb up the stairs a day?				How do you go to work?		
	0	1-2 floors	3-4 floors	≥5 floors	Walking (<30 min)	Walking (≥30 min)	Other
15-24	15,1	41,2	24,2	19,5	16,8	2,8	80,4
25-34	18,2	38,4	23,3	20,1	21,2	2,9	75,9
35-44	18,7	40,6	21,7	18,9	26,4	2,8	70,7
45-54	20,0	41,4	22,5	16,2	23,3	5,0	71,7
55-64	23,0	44,3	16,8	15,9	34,1	7,3	58,5
65-74	30,1	43,5	15,7	10,7	33,3	16,7	50,0
75+	39,8	43,5	12,3	4,5	0,0	100,0	0,0
NUTS1 Regions							
İstanbul	14,9	39,4	27,5	18,3	22,1	4,1	73,8
Western Marmara	26,4	41,1	17,3	15,2	22,7	2,7	74,7
Aegean	20,9	41,5	19,5	18,1	21,2	1,7	77,1
Eastern Marmara	16,1	40,7	26,5	16,7	17,3	2,6	80,1
Western Anatolia	16,2	41,8	22,9	19,2	13,0	3,1	84,0
Mediterranean	20,2	44,1	19,7	16,1	21,6	4,1	74,3
Central Anatolia	29,9	38,6	14,5	17,1	25,0	5,6	69,4
Western Black Sea	20,9	41,5	18,5	19,1	32,4	5,9	61,8
Eastern Black Sea	18,2	38,0	22,4	21,5	32,7	5,8	61,5
North Eastern Anatolia	41,1	34,2	12,9	11,9	15,0	5,0	80,0
Middle Eastern Anatolia	31,2	37,9	17,0	13,8	45,5		54,5
South Eastern Anatolia	23,5	46,0	16,1	14,4	21,7	1,7	76,7
Area of residence							
Rural	29,3	43,2	12,2	15,2	22,3	4,5	73,2
Urban	17,0	40,5	24,7	17,8	21,5	3,1	75,4
Total	20,3	41,1	21,3	17,2	21,7	3,4	74,9
Total*	20,1	41,1	21,4	17,4	22,7	8,9	68,4
Number of Participants	1740	3524	1821	1477	303	48	1041

* Standardized using Turkey 2010 population

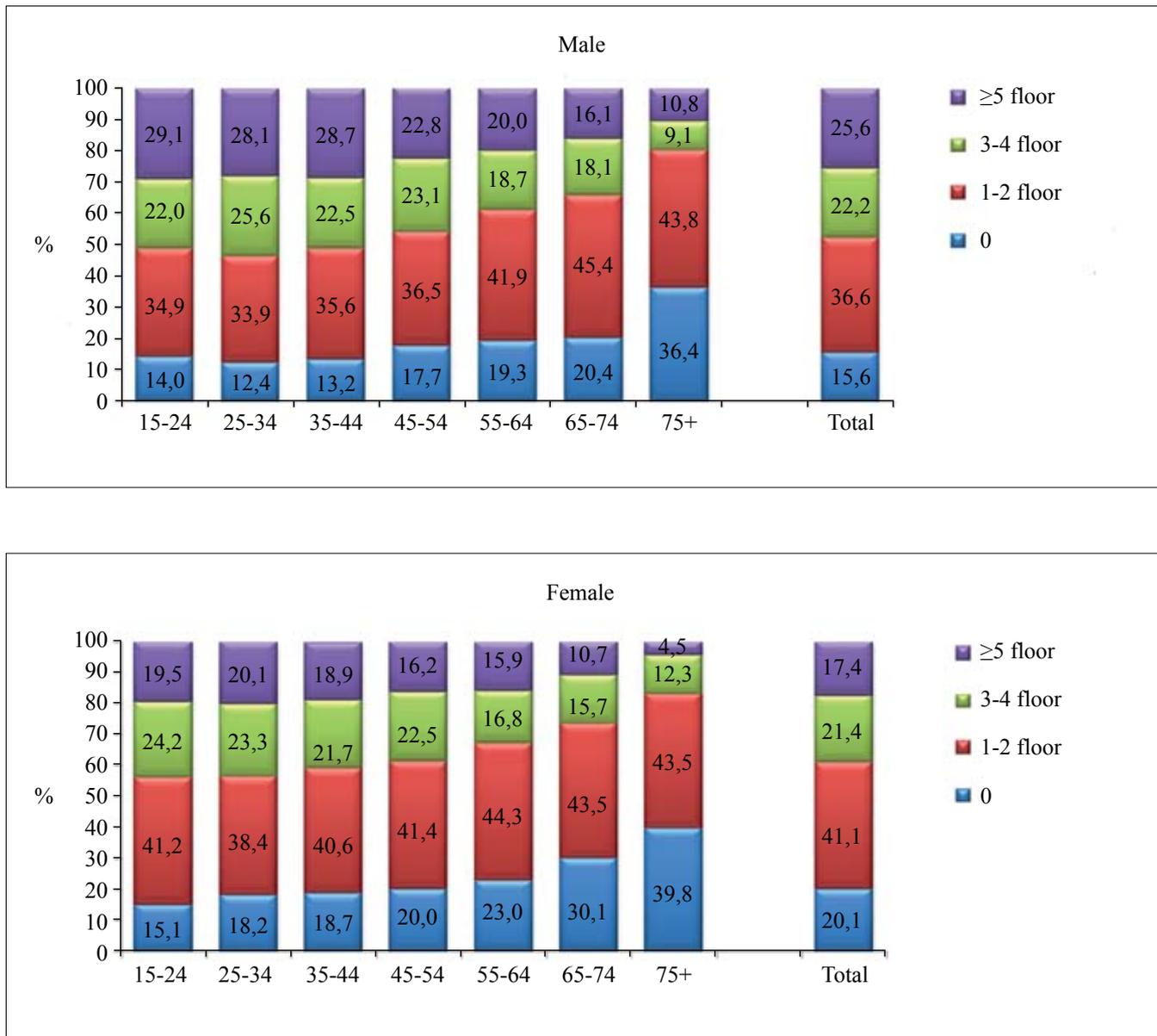


Figure 12.3 The proportion of climbing stairs by age and sex, Turkey 2011



Physical Activity Levels For Transportation

A very few number of the employed individuals (6% in male and 9% in female) walk at least 30 minutes to their workplace. The proportions of walking to the workplace are slightly higher in older age groups in both sexes, and in rural areas (Table 12.6, 12.7).

Occupational Physical Activity

Occupational activity in male is higher than in female. Almost half of male stated that they were physically active enough to sweat during work and felt very tired after the work. Two-tenth of employed male has moderate physical activity and three-tenth of them have vigorous physical activity. 10% of employed female have moderate physical activity and 18% have vigorous physical activity. The physical activity levels are similar in age groups in both sexes (Table 12.8, 12.9).



Table 12.8 Occupational activity levels in male by age, Turkey 2011.

	15-24 %	25-34 %	35-44 %	45-54 %	55-64 %	65-74 %	75+ %	Total %
I usually work at sitting position								
Never/seldom	62,4	60,5	59,9	57,3	56,0	65,7	65,0	59,9
Sometimes	13,5	10,9	12,5	12,7	12,7	14,3	15,0	12,2
Frequently/Always	24,1	28,5	27,6	30,0	31,3	20,0	20,0	27,9
I work at standing position								
Never/seldom	24,4	26,7	25,1	28,0	28,3	18,8	20,0	26,1
Sometimes	10,5	11,1	13,0	11,1	14,8	13,0	5,0	11,8
Frequently/Always	65,2	62,2	61,9	60,9	56,9	68,1	75,0	62,1
I need to move always at work								
Never/seldom	17,0	19,7	19,7	19,8	21,0	18,3	10,0	19,3
Sometimes	8,3	9,0	10,3	10,0	10,5	5,6	25,0	9,6
Frequently/Always	74,7	71,4	70,0	70,3	68,5	76,1	65,0	71,1
I need to lift heavy loads								
Never/seldom	50,8	51,7	50,0	52,2	57,3	60,0	57,1	51,7
Sometimes	18,8	16,6	17,6	18,4	16,2	18,6	33,3	17,6
Frequently/Always	30,4	31,7	32,4	29,4	26,5	21,4	9,5	30,7
I feel tired after work								
Never/seldom	24,9	22,0	22,1	25,1	25,2	38,2	15,0	23,4
Sometimes	25,3	24,9	23,1	24,0	29,8	30,9	20,0	24,7
Frequently/Always	49,7	53,1	54,8	50,9	45,0	30,9	65,0	51,9
I am physically active enough to sweat								
Never/seldom	32,6	33,1	34,4	36,7	38,9	35,8	25,0	34,4
Sometimes	15,7	15,7	14,5	14,8	16,2	14,9	20,0	15,2
Frequently/Always	51,7	51,2	51,1	48,5	44,9	49,3	55,0	50,3
I do vigorous physical activity at least 10 minutes								
Never/seldom	66,6	65,9	65,9	71,2	73,9	65,7	73,7	67,5
Sometimes	13,4	14,2	13,2	10,4	9,1	14,9	10,5	12,8
Frequently/Always	20,0	20,0	20,9	18,5	17,0	19,4	15,8	19,8
I do moderate physical activity at least 10 minutes								
Never/seldom	57,0	57,1	54,4	57,6	52,3	40,8	57,1	55,8
Sometimes	15,1	16,1	19,6	15,9	16,3	22,5	14,3	17,0
Frequently/Always	27,9	26,9	26,0	26,5	31,4	36,6	28,6	27,2
Number of Participants	1201	1606	1510	996	419	125	43	5900



Table 12.9 Occupational activity levels in female by age, Turkey 2011.

	15-24 %	25-34 %	35-44 %	45-54 %	55-64 %	65-74 %	75+ %	Total %
I usually work at sitting position								
Never/seldom	46,9	44,0	52,9	57,0	67,6	80,0	100,0	50,0
Sometimes	9,4	11,6	15,7	17,0	11,8	20,0	0,0	13,1
Frequently/Always	43,6	44,4	31,4	26,0	20,6	0,0	0,0	36,9
I work at standing position								
Never/seldom	37,7	40,0	29,9	24,5	24,2	0,0	0,0	33,5
Sometimes	14,0	11,3	12,4	19,5	9,1	20,0	50,0	13,5
Frequently/Always	48,3	48,8	57,7	56,0	66,7	80,0	50,0	53,0
I need to move always at work								
Never/seldom	27,3	31,6	23,0	21,8	20,6	0,0	0,0	26,1
Sometimes	12,8	10,1	8,9	13,9	11,8	16,7	0,0	11,0
Frequently/Always	59,9	58,3	68,1	64,4	67,6	83,3	100,0	62,9
I need to lift heavy loads								
Never/seldom	79,2	75,8	71,3	63,5	56,3	40,0	50,0	72,7
Sometimes	11,9	11,8	11,0	16,5	18,8	40,0	50,0	12,6
Frequently/Always	8,9	12,5	17,7	20,0	25,0	20,0	0,0	14,7
I feel tired after work								
Never/seldom	20,0	18,5	13,2	18,7	9,4	0,0	0,0	16,9
Sometimes	26,2	23,8	21,6	25,8	28,1	40,0	50,0	24,2
Frequently/Always	53,8	57,8	65,2	55,6	62,5	60,0	50,0	58,9
I am physically active enough to sweat								
Never/seldom	47,8	52,4	47,8	40,6	31,3	0,0	0,0	47,4
Sometimes	17,9	16,0	7,5	10,2	15,6	40,0	50,0	13,1
Frequently/Always	34,4	31,6	44,8	49,2	53,1	60,0	50,0	39,5
I do vigorous physical activity at least 10 minutes								
Never/seldom	81,5	79,1	76,1	76,4	64,7	80,0	100,0	78,0
Sometimes	11,6	8,5	13,2	11,1	11,8	0,0	0,0	11,0
Frequently/Always	6,8	12,3	10,7	12,6	23,5	20,0	0,0	11,0
I do moderate physical activity at least 10 minutes								
Never/seldom	70,7	71,5	64,9	58,3	58,8	40,0	50,0	66,9
Sometimes	16,0	11,3	18,0	15,1	5,9	40,0	0,0	14,9
Frequently/Always	13,3	17,3	17,0	26,6	35,3	20,0	50,0	18,2
Number of Participants	743	441	427	228	56	10	5	1910



Change in Physical Activity Habits

The percentage who have increased physical activity level in the last six months (8%) and the percentage who intent to increase physical activity (approximately 40%) were quite similar in male and in female. The percentage of increasing physical activity in the last six months and the percentage of intention to increase physical activity decrease with age. The percentage of increasing physical activity in both sexes is similar in terms of residence and NUTS1 regions. However, the intention to increase physical activity is higher in urban areas (Table 12.10, and Table 12.11, Figure 12.4 and Figure 12.5).

Table 12.10 Change in physical activity levels and intention to increase physical activity in male by age, area of residence and NUTS1 Regions, Turkey 2011.

	Physical activity levels in the last 6 months			Intention to increase physical activity levels	
	No change	Increased	Decreased	Yes	No
Age groups					
15-24	73,6	13,3	13,1	47,1	52,9
25-34	83,0	8,6	8,4	42,2	57,8
35-44	86,7	7,4	5,9	37,4	62,6
45-54	88,7	6,2	5,2	32,7	67,3
55-64	87,8	5,4	6,8	29,3	70,7
65-74	86,6	4,1	9,3	19,3	80,7
75+	86,0	2,9	11,1	12,7	87,3
NUTS1 Regions					
İstanbul	80,4	8,0	11,6	44,8	55,2
Western Marmara	88,0	7,2	4,7	30,3	69,7
Aegean	84,9	7,8	7,2	33,8	66,2
Eastern Marmara	83,6	9,4	7,1	38,6	61,4
Western Anatolia	83,4	7,5	9,1	38,8	61,2
Mediterranean	86,6	6,5	6,9	36,5	63,5
Central Anatolia	80,0	11,1	8,8	36,7	63,3
Western Black Sea	84,6	8,3	7,1	27,6	72,4
Eastern Black Sea	82,5	8,1	9,4	35,4	64,6
North Eastern Anatolia	84,4	7,4	8,2	28,3	71,7
Middle Eastern Anatolia	82,9	7,5	9,6	31,8	68,2
South Eastern Anatolia	86,3	7,8	6,0	32,6	67,4
Area of residence					
Rural	85,2	8,5	6,4	24,8	75,2
Urban	83,2	7,8	9,0	41,4	58,6
Total	83,8	8,0	8,2	36,4	63,6
Total*	83,2	8,4	8,5	37,5	62,5
Number of Participants	7126	678	700	3104	5424

* Standardized using Turkey 2010 population



Table 12.11 Change in physical activity and intention to increase physical activity levels in female by age, area of residence and NUTS1 Regions, Turkey 2011

Age groups	Physical activity levels in the last 6 months			Intention to increase physical activity levels	
	No change	Increased	Decreased	Yes	No
15-24	80,7	9,7	9,5	45,8	54,2
25-34	80,0	10,0	10,0	41,9	58,1
35-44	82,4	10,0	7,6	45,3	54,7
45-54	82,0	8,6	9,5	42,1	57,9
55-64	82,9	6,9	10,3	31,4	68,6
65-74	84,8	3,7	11,6	16,8	83,2
75+	79,5	2,2	18,3	8,7	91,3
NUTS1 Regions					
İstanbul	79,4	7,1	13,5	49,9	50,1
Western Marmara	84,0	7,6	8,3	34,0	66,0
Aegean	81,3	9,1	9,6	37,7	62,3
Eastern Marmara	80,5	9,5	10,0	41,2	58,8
Western Anatolia	78,3	10,8	10,9	45,2	54,8
Mediterranean	83,3	7,4	9,3	38,4	61,6
Central Anatolia	80,0	10,9	9,0	35,8	64,2
Western Black Sea	81,3	10,7	7,9	32,2	67,8
Eastern Black Sea	81,8	9,0	9,3	31,8	68,2
North Eastern Anatolia	84,9	10,0	5,0	28,8	71,2
Middle Eastern Anatolia	85,3	7,1	7,6	29,2	70,8
South Eastern Anatolia	86,5	6,4	7,2	28,3	71,7
Area of residence					
Rural	84,3	8,4	7,3	23,8	76,2
Urban	80,6	8,6	10,9	45,1	54,9
Total	81,6	8,6	9,9	39,0	61,0
Total*	81,5	8,6	9,9	39,2	60,8
Number of Participants	7498	788	906	3614	5644

* Standardized using Turkey 2010 population

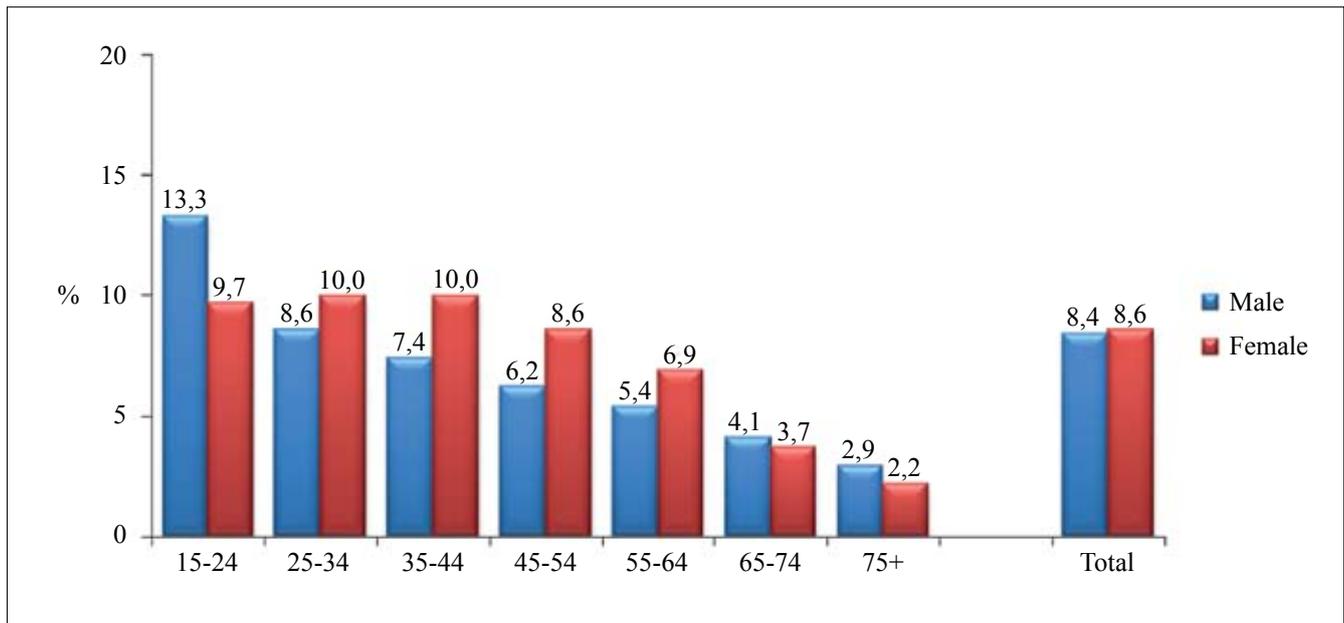


Figure 12.4 Increase in physical activity levels in the last six months by age and sex, Turkey 2011.

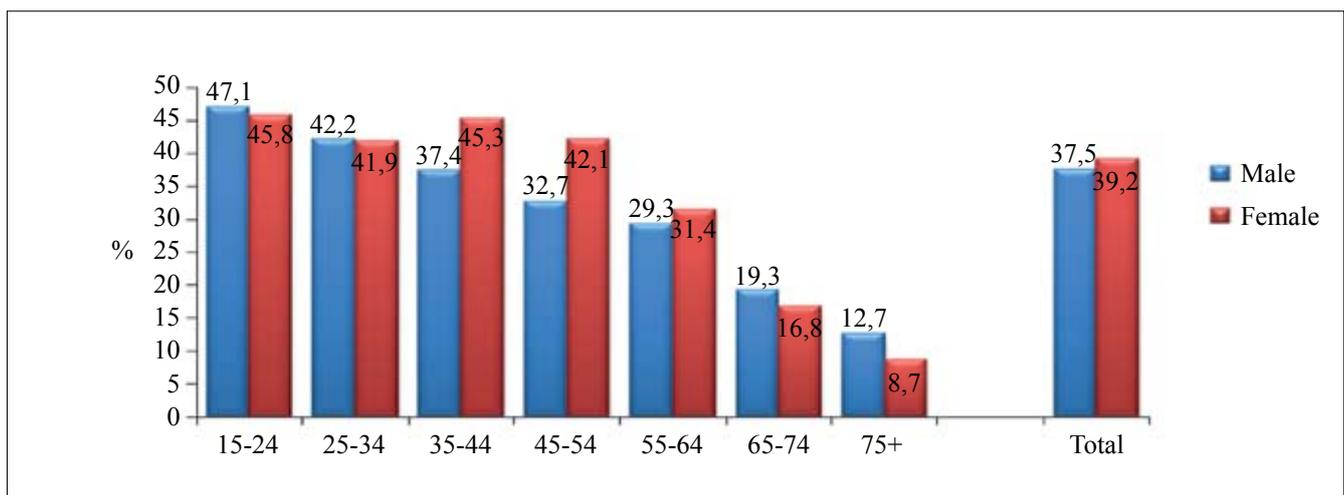


Figure 12.5 Intention to increase physical activity levels by to age and sex, Turkey 2011.

12.4 Discussion

The physical activity levels of individuals were evaluated separately for leisure time, home activities, transportation and occupational activities in this study. The findings indicate that the physical activity levels of Turkish population, especially in female, are low. One fifth of male and one tenth of female meet the recommended level of physical activity in leisure times. When home activities are considered, almost half of male and female stated that they spent more than 4 hours a day for watching TV or using a computer. Climbing up the stairs and walking to workplace are very seldom. Occupational activity levels are higher compared to the ones in leisure time and home activities. Most of the employed male work in manufacturing and agriculture sectors, thus, the employed male need to be very physically active during their work. The employed female work in jobs need less effort. Physical activity level was found less in older age groups and in urban areas besides female. These groups should be given priority in planning and improving physical activity of the community.



In the Health Survey for England, conducted in 2008, detailed information about leisure time, home activities, transportation and occupational activities were collected and summarized. In this survey, 39% of male and 29% of female were found to meet the weekly recommendations of physical activity of 30 minutes or more moderate or vigorous activity on at least five days per week. Due to the methodological differences in the physical activity assessments of the Turkey Chronic Diseases and Risk Factors Survey and the Health Survey for England, the differences in the physical activity levels between Turkish and British population could not be compared directly. In the current survey, leisure time physical activity levels of individuals, home activities, transportation and occupational activities could not be summarized since a very few number of questions about physical activity were included. It is recommended that special surveys should be done in order to determine physical activity level of the Turkish population in detail.

Turkish people spent approximately three hours a day by watching TV; this is half an hour longer in female than that in men. When we add the time for using a computer, Turkish people spent approximately four hours a day for watching TV or using a computer. When it is considered that this time does not include other sedentary times of the day, it is seen that the sedentary time is quite high among Turkish people. In the Health Survey for England, the time spent for eating meals, studying, painting and reading was added to the time spent in front of a screen and the average of sedentary time was found 5 hours a day (7). These results indicate that Turkish population spend more time sedentarily than the British population. Although the time spent watching TV is longer in female than men, and the time spent using a computer is longer in male than in female, the total time spent in front of a screen is similar for both sexes. Similarly in both sexes, the time spent watching TV is longer in older age groups and the time spent using a computer is longer in younger age groups. These differences should be taken into consideration in the educational messages to be given to the different groups of the population.

Of the study group, 6% of male and 10% of female have increased physical activity in the last six months. More importantly every four tenth of male and female have an intention to increase their physical activity. In the Balçova's Heart Project, almost half of the participants were found to have an intention to increase their physical activity levels (8). These results indicate that the Turkish population believe the importance of the physical activity, and suggest that physical activity facilities should be increased.



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13

Cardiovascular Diseases





13 Cardiovascular Diseases

Professor Belgin ÜNAL

Key Findings

- This section presents the prevalence of coronary heart disease and stroke by sex, age groups, area of residence and NUTS1 regions in population above 15 years of age.
- Angina pectoris prevalence defined as self report or Rose questionnaire is 6,4% in male and 9,8% in female.
- Acute myocardial infarction was reported by 2,3% of males and 1,1% of females.
- Prevalence of self reported coronary heart disease is 3,8% in males and 2,3% in females.
- In males, Western Anatolia Region has the highest prevalence of coronary heart disease with 7,5%. In females Western Black Sea and Central Anatolia has the highest prevalences.
- Among post acute myocardial infarction patients 68,6% of males and 51% of female have prescription report and use regular medicine but %16 of males and 30% females do not use any medication.
- Cerebrovascular disease prevalence is 1,8% in males and 2,2% in females.
- In all age groups cerebrovascular disease prevalence is higher in females than males.
- There are regional differences in cerebrovascular disease prevalence. In females Eastern Marmara and Middle Eastern Anatolia has over 3% cerebrovascular disease prevalence. In males West and East BlackSea Region have the highest prevalences.
- Among patients with stroke history, 42% of males and 26% of females with stroke have chronic disease report and use regular medicine for stroke. Approximately fifty percent of patients with stroke history do not use regular medication.
- Among stroke patients 29% of males and 20% of females were given antithrombotic therapy treatment at the acute phase. Surgical treatment is approximately 6% both in males and females.



13.1 Introduction

Cardiovascular diseases are diseases that affect the heart and the vascular system. Underlying cause of cardiovascular diseases is atherosclerosis. Coronary heart disease (CHD) comprises of a group of clinic syndromes such as angina pectoris, acute myocardial infarction and sudden death caused by thrombosis in coronary arteries due to atherosclerosis. Heart failure due to CHD is also considered in this group of clinic syndromes.

In a study conducted on 20-and-above population in Turkey in 1990, CHD prevalence was reported 4.1% in males and 3.5% in females (1). In TURKSTAT 2010 Health Survey self reported angina pectoris prevalence is 4,2% in both sex over 15 years of age. Myocardial infarction prevalence is 2,1% in male and 0,7% in female (2).

Cerebrovascular diseases (CVD) comprise the second largest group in cardiovascular diseases. According to National Burden of Disease Study 8% and 5% of the DALYs are caused by CHD and cerebrovascular disease respectively in 2000 (3). Comprehensive data on stroke epidemiology is limited in Turkey. In TURKSTAT 2010 Health Survey doctor diagnosed stroke prevalence is 1,2% in male and 1% in female over 15 years of age (2).

13.2 Methods and Definitions

In this study, coronary heart disease and stroke prevalences were determined according to self-reports. The individuals who were selected for the sample of the study were invited to the FHCs by the family physicians. Family physicians collected the medical history of the participants using the survey forms prepared in the digital medium.

The angina pectoris (AP) history was questioned by asking the patients the question “Have you been informed that you had angina pectoris (chest pain due to heart condition)?” Also, the Rose Survey, prepared for diagnosing angina pectoris in epidemiological studies, was conducted and the participants were asked about angina pectoris symptoms in the last month. Participants who stated that they had angina pectoris history and the ones who were diagnosed with angina pectoris according to the results of the Rose survey were accepted as having angina pectoris. When providing AP prevalence, individuals with acute myocardial infarction, by-pass or balloon angioplasty histories were removed both from the numerator and the denominator.

Acute myocardial infarction (AMI) history was surveyed by the question “Have you had heart crisis or myocardial infarction diagnosed by a physician?” In addition the participants were asked whether they had coronary by-pass surgery balloon angioplasty. Individuals with a history of AMI, coronary by-pass operation or balloon angioplasty were accepted as coronary heart disease patients.

Stroke history was determined by asking the participants the question “Have you had any unexpected disability, numbness, speech disorder, visual disorder, imbalance, disorder in eye movements in any side of the body which lasted more than 24 hours?” Participants who confirmed these conditions were accepted as having stroke. For transient stroke/paralysis the participants were asked the question “Have



you had any unexpected disability, numbness, speech disorder, visual disorder, imbalance, disorder in eye movements in any side of the body which lasted shorter than 24 hours?” Participants who replied positively were considered as having cerebrovascular disease.

13.3 Findings

AP was reported in 6.4% of males, and 9.8% of females. A linear increase was found in AP prevalence in females with aging. AP prevalence in males varies between 3.7% and 9.9%.

It attracts attention that AP prevalence in males and females was found highest in North-eastern Anatolia followed by Central Anatolia and South-eastern Anatolia regions. A significant difference between prevalences in rural and urban areas could not be found (Table 13.1, 13.2, Figure 13.1).

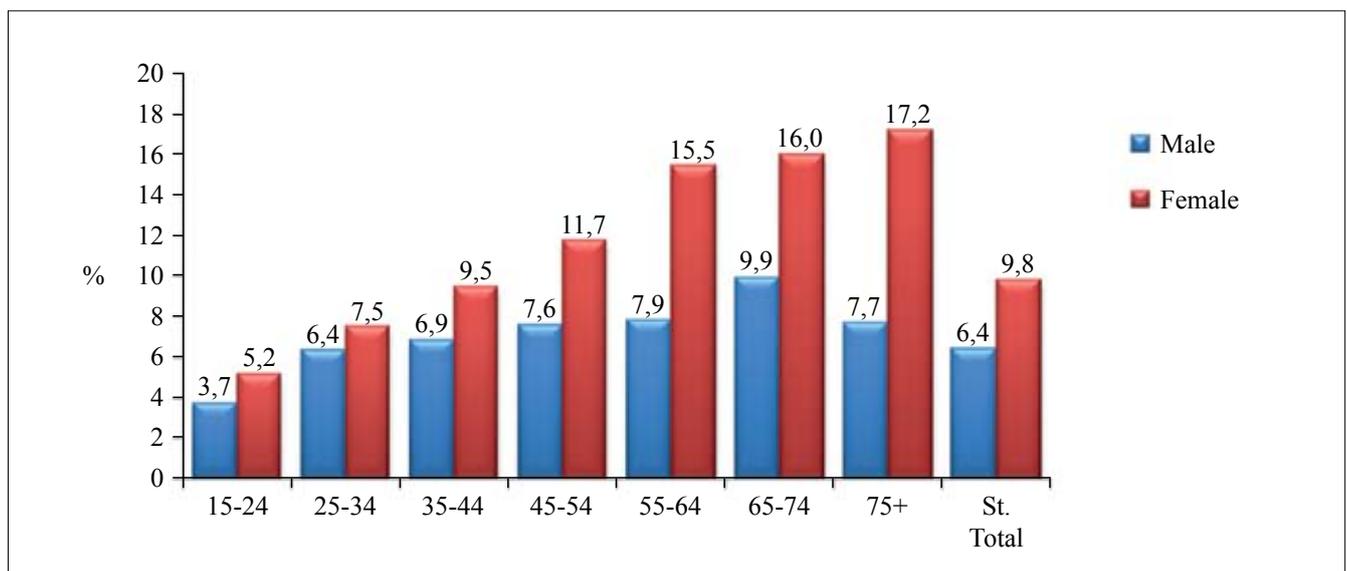


Figure 13.1 Prevalence of Angina Pectoris by sex and age groups, Turkey 2011.



Table 13.1 Angina Pectoris Prevalence in males by age groups, NUTS1 regions and area of residence, Turkey 2011.

Age Groups	Angina History		Angina based on Rose Questionnaire		Angina based on history or Rose Questionnaire	
	n	%	n	%	n	%
15-24	38	2,2	28	1,6	64	3,7
25-34	78	4,3	55	3,0	117	6,4
35-44	73	4,4	65	3,8	116	6,9
45-54	78	5,7	42	3,0	106	7,6
55-64	64	6,7	26	2,7	76	7,9
65-74	41	8,6	21	4,3	48	9,9
75+	16	5,9	7	2,6	21	7,7
NUTS1 Regions						
İstanbul	83	5,5	34	2,2	106	6,9
Western Marmara	6	1,5	3	0,8	10	2,5
Aegean	45	4,1	32	2,9	66	5,9
Eastern Marmara	28	3,5	20	2,4	39	4,8
Western Anatolia	37	5,1	17	2,3	49	6,6
Mediterranean	56	5,2	30	2,8	71	6,6
Central Anatolia	25	5,8	13	3,0	30	6,9
Western Black Sea	28	5,3	19	3,5	41	7,6
Eastern Black Sea	9	3,0	10	3,3	16	5,3
North Eastern Anatolia	18	7,5	12	4,9	27	11,0
Middle Eastern Anatolia	19	4,6	18	4,3	34	8,1
South Eastern Anatolia	35	4,8	36	4,8	60	8,1
Area of Residence						
Rural	118	4,8	88	3,5	176	7,0
Urban	264	4,7	152	2,7	364	6,4
Total (%95 CI)	388	4,7 (4,3-5,2)	244	2,9 (2,6-3,3)	548	6,6 (6,0-7,1)
Total*		4,6		2,9		6,4

* Standardized using Turkey 2010 population



Table 13.2 Angina Pectoris Prevalence in females by age groups, NUTS1 regions and area of residence, Turkey 2011.

Age Groups	Angina History		Angina based on Rose Questionnaire		Angina based on history or Rose Questionnaire	
	n	%	n	%	n	%
15-24	40	2,2	71	3,8	97	5,2
25-34	76	3,8	105	5,2	152	7,5
35-44	104	5,6	118	6,3	177	9,5
45-54	115	6,9	130	7,7	197	11,7
55-64	110	10,5	100	9,4	164	15,5
65-74	60	10,5	62	10,6	93	16,0
75+	54	13,8	31	7,8	68	17,2
NUTS1 Regions						
İstanbul	119	6,8	115	6,5	186	10,5
Western Marmara	24	5,6	25	5,7	37	8,5
Aegean	75	5,5	82	5,9	126	9,1
Eastern Marmara	48	5,3	49	5,4	79	8,7
Western Anatolia	36	3,8	56	5,8	78	8,1
Mediterranean	53	4,5	62	5,2	92	7,8
Central Anatolia	35	7,2	35	7,1	58	11,7
Western Black Sea	36	6,1	43	7,2	60	10,0
Eastern Black Sea	17	5,1	25	7,4	35	10,4
North Eastern Anatolia	24	10,1	26	10,7	42	17,4
Middle Eastern Anatolia	37	10,3	33	9,1	60	16,5
South Eastern Anatolia	57	7,4	66	8,3	95	11,9
Area of Residence						
Rural	157	6,0	188	7,1	277	10,4
Urban	384	5,8	418	6,3	644	9,7
Total	559	6,0	617	6,5	948	10,0
(%95 CI)		(5,5-6,5)		(5,9-6,9)		(9,4-10,6)
Total*		5,8		6,4		9,8

* Standardized using Turkey 2010 population

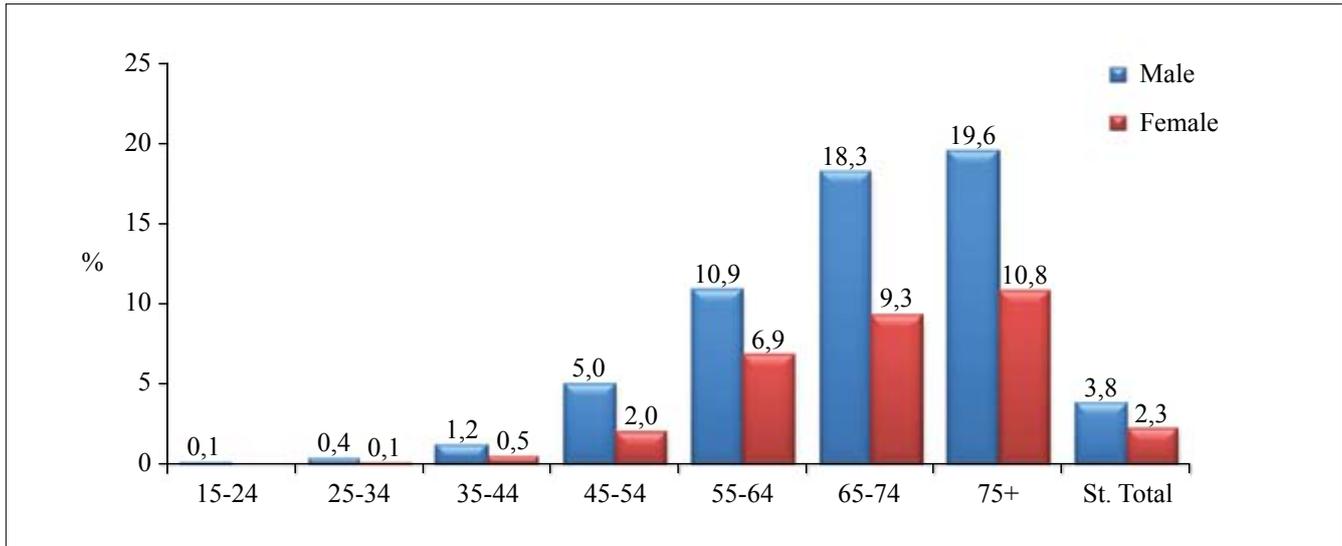


Figure 13.2 Coronary Heart Disease Prevalence by sex and age groups, Turkey 2011.

Coronary Artery Disease prevalence was found 4% in males and 2% in males in the population over 15 years of age. CAD prevalence increases with age in males and reaches up to 20% in the 75-and-above group. CAD prevalence is 5% in males and 2,6% in females in the population over 20 years of age and 6,1% in males and 3,3%in females in the population over 30 years of age.

Western Anatolia is the region where CAD is most prevalent in males, with a 7.5% rate. The region with the lowest prevalence is South-eastern Anatolia with a 3% rate. In females CAD prevalence is highest in Western Black Sea and Central Anatolia regions. CAD prevalence is higher in males living in urban areas than the ones living in rural areas, while in females CAD prevalence is higher in rural areas (Figure 13.3, Table 13.3, 13.4).

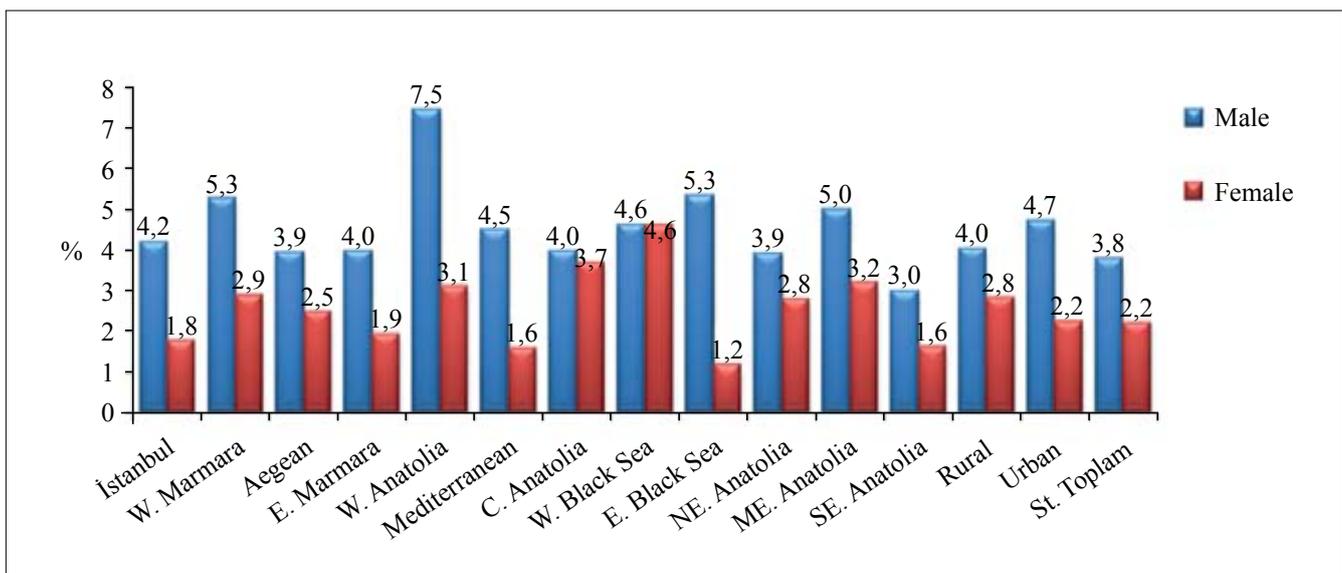


Figure 13.3 Coronary Heart Disease Prevalence by NUTS1 regions for male and female, Turkey 2011.



Table 13.3 AMI, By-Pass surgery, PTCA and coronary heart disease history in male by age groups, NUTS1 regions and area of residence, Turkey 2011.

Males	AMI		BY-PASS		PTCA		CHD	
Age groups	n	%	n	%	n	%	n	%
15-24	0	0	1	0,1	1	0,1	2	0,1
25-34	5	0,3	0	0	5	0,3	7	0,4
35-44	14	0,8	3	0,2	8	0,5	21	1,2
45-54	48	3,3	20	1,4	42	2,9	74	5,0
55-64	64	6,0	46	4,3	71	6,7	118	10,9
65-74	64	11,0	44	7,5	65	11,2	108	18,3
75+	38	11,4	27	8,1	42	12,8	66	19,6
NUTS1 Regions								
İstanbul	41	2,6	28	1,8	37	2,4	67	4,2
Western Marmara	12	2,9	10	2,4	9	2,2	22	5,3
Aegean	23	2,0	15	1,3	34	3,0	46	3,9
Eastern Marmara	24	2,8	10	1,2	17	2,0	34	4,0
Western Anatolia	39	4,9	23	2,9	30	3,9	60	7,5
Mediterranean	24	2,1	22	2,0	33	3,0	51	4,5
Central Anatolia	16	3,6	6	1,3	13	2,9	18	4,0
Western Black Sea	15	2,7	11	2,0	12	2,2	26	4,6
Eastern Black Sea	10	3,2	7	2,2	9	2,9	17	5,3
North Eastern Anatolia	8	3,2	1	0,4	6	2,4	10	3,9
Middle Eastern Anatolia	8	1,9	3	0,7	19	4,5	22	5,0
South Eastern Anatolia	12	1,6	7	0,9	14	1,9	23	3,0
Area of Residence								
Rural	57	2,2	33	1,3	66	2,6	105	4,0
Urban	170	2,9	106	1,8	167	2,8	284	4,7
Total (%95 CI)	233	2,7	141	1,6	234	2,7	396	4,5
		(2,4-3,1)		(1,4-1,9)		(2,4-3,1)		(4,1-5,0)
Total*		2,3		1,4		2,3		3,8
Over age 20	231	3,0	141	1,9	223	2,9	384	5,0
Over age 30	230	3,8	140	2,3	220	3,6	380	6,1

* Standardized using Turkey 2010 population



Table 13.4 AMI, By-Pass surgery, PTCA and coronary heart disease history in female by age groups, NUTS1 regions and area of residence, Turkey 2011.

Females	AMI		BY-PASS		PTCA		CHD	
	n	%	n	%	n	%	n	%
Age groups								
15-24	0	0	0	0	0	0	0	0
25-34	2	0,1	0	0	1	0,1	2	0,1
35-44	4	0,2	3	0,2	6	0,3	10	0,5
45-54	18	1,1	8	0,5	20	1,2	35	2,0
55-64	43	3,8	16	1,4	42	3,8	78	6,9
65-74	20	3,2	16	2,5	43	6,9	60	9,3
75+	26	6,1	19	4,5	18	4,2	48	10,8
NUTS1 Regions								
İstanbul	12	0,7	8	0,5	19	1,1	32	1,8
Western Marmara	6	1,4	5	1,1	5	1,1	13	2,9
Aegean	20	1,4	7	0,5	24	1,7	35	2,5
Eastern Marmara	12	1,3	5	0,5	7	0,8	18	1,9
Western Anatolia	15	1,5	10	1,0	17	1,8	31	3,1
Mediterranean	10	0,8	4	0,3	11	0,9	19	1,6
Central Anatolia	7	1,4	5	1,0	12	2,4	19	3,7
Western Black Sea	15	2,4	6	1,0	15	2,4	29	4,6
Eastern Black Sea	2	0,6	2	0,6	2	0,6	4	1,2
North Eastern Anatolia	6	2,4	2	0,8	4	1,6	7	2,8
Middle Eastern Anatolia	7	1,9	2	0,5	5	1,4	12	3,2
South Eastern Anatolia	4	0,5	6	0,8	8	1,0	13	1,6
Area of Residence								
Rural	37	1,4	23	0,9	38	1,4	77	2,8
Urban	76	1,1	38	0,6	90	1,4	153	2,2
Total (%95 CI)	113	1,2	62	0,7	130	1,4	233	2,4
		(1,0-1,4)		(0,5-0,8)		(1,2-1,6)		(2,1-2,7)
Total*		1,1		0,6		1,3		2,2
Over age 20	112	1,3	59	0,7	130	1,5	229	2,6
Over age 30	111	1,6	59	0,9	130	1,9	228	3,3

* Standardized using Turkey 2010 population

The study also investigated the conditions of treatment and use of medication in participants with AMI, by-pass or balloon angioplasty histories. Among post acute myocardial infarction patients 68,6% of males and 51% of females have prescription report and use regular medicine. In males with AMI history 16% were not receiving any treatment while in females 29% were not receiving any treatment. Rate of having prescription report and using regular medicine in population with a history of by-pass and angioplasty is over 70%. However there's a group, higher in females, constituting the 18% who do not receive treatment (Table 13.5).



Table 13.5 Treatment use by sex among patients with AMI, By-pass ve angioplasty history, Turkey 2011.

Treatment					
AMI	Have medical report, receiving treatment	Do not have medical report, receiving treatment	Do not receive treatment	Number	Total
Male	68,6	15,7	15,7	210	100,0
Female	51,4	19,3	29,4	109	100,0
Total	62,7	16,9	20,4	319	100,0
By-pass					
Male	76,9	15,4	7,7	130	100,0
Female	71,4	10,7	17,9	56	100,0
Total	75,3	14,0	10,8	186	100,0
PTCA					
Male	70,0	13,1	16,9	213	100,0
Female	67,9	14,3	17,9	112	100,0
Total	69,2	13,5	17,2	325	100,0

Cerebrovascular disease prevalence was found 1.8% in males and 2.2% in females in the population above 15 years of age. In all age groups CVD prevalence is higher in females than males. A significant increase in CVD prevalence with aging attracts attention in both sexes.

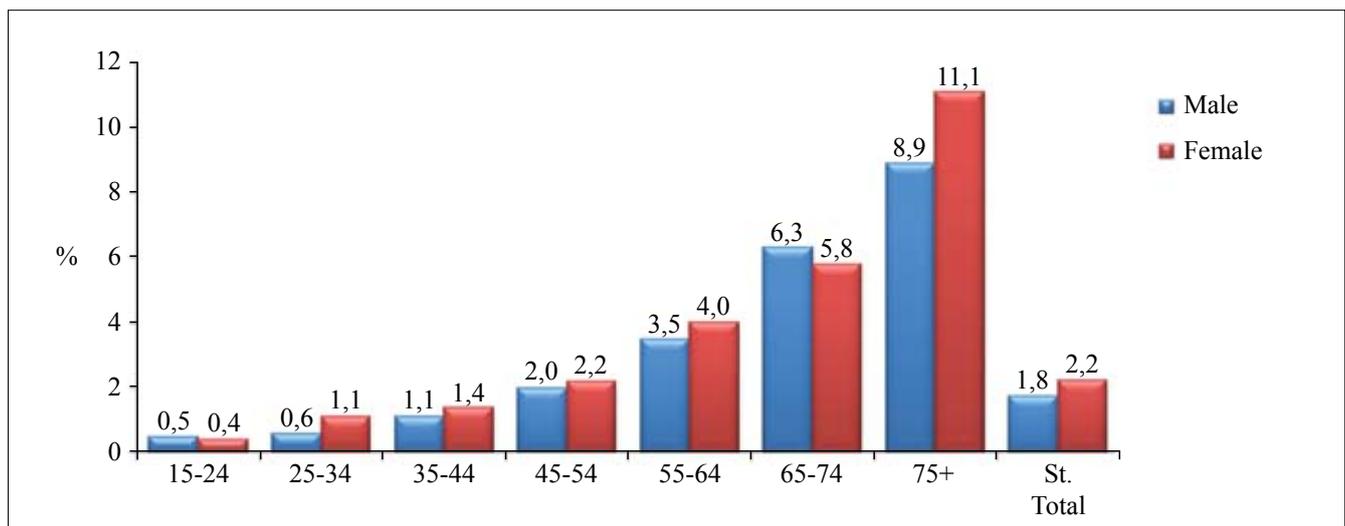


Figure 13.4 Cerebrovascular Disease Prevalence by sex and age groups, Turkey 2011.



Table 13.6 Family history for stroke, physician diagnosed stroke and transient ischemic attack frequency in males by age, NUTS1 regions and area of residence, Turkey 2011.

Males	Family history for stroke		Self-history for stroke		Self-history for transient ischemic attack		Stroke or TIA	
	n	%	n	%	n	%	n	%
Age Groups								
15-24	35	2,0	5	0,3	4	0,2	9	0,5
25-34	92	5,0	8	0,4	4	0,2	12	0,6
35-44	164	9,6	8	0,5	11	0,7	18	1,1
45-54	145	9,9	16	1,1	15	1,0	29	2,0
55-64	116	10,7	22	2,1	18	1,7	38	3,5
65-74	69	11,7	25	4,3	17	3,0	37	6,3
75+	22	6,5	25	7,7	14	4,3	30	8,9
NUTS1 Regions								
İstanbul	143	9,0	13	0,8	15	1,0	27	1,7
Western Marmara	38	9,1	3	0,7	2	0,5	4	1,0
Aegean	69	5,9	16	1,4	12	1,1	26	2,2
Eastern Marmara	61	7,1	17	2,0	10	1,2	24	2,8
Western Anatolia	38	4,7	9	1,2	9	1,2	15	1,9
Mediterranean	93	8,2	9	0,8	5	0,5	13	1,1
Central Anatolia	35	7,8	6	1,3	5	1,1	10	2,2
Western Black Sea	42	7,5	12	2,2	11	2,0	19	3,4
Eastern Black Sea	22	6,9	8	2,6	3	1,0	10	3,1
North Eastern Anatolia	21	8,2	3	1,2	2	0,8	5	2,0
Middle Eastern Anatolia	28	6,3	4	0,9	1	0,2	4	0,9
South Eastern Anatolia	53	6,9	10	1,3	8	1,1	17	2,2
Area of Residence								
Rural	193	7,4	34	1,3	28	1,1	54	2,1
Urban	442	7,4	74	1,3	55	0,9	118	2,0
Total	643	7,3	109	1,3	83	1,0	173	2,0
(%95 CI)		(6,8-7,9)		(1,1-1,5)		(0,8-1,2)		(1,7-2,3)
Total*		6,9		1,1		0,9		1,8
20-and-above	628	8,1	109	1,4	81	1,1	171	2,2
30-and-above	589	9,5	103	1,7	77	1,3	161	2,6

* Standardized using Turkey 2010 population



Table 13.7 Family history for stroke, physician diagnosed stroke and transient ischemic attack frequency in females by age, NUTS1 regions and area of residence, Turkey 2011.

Females	Family history for stroke		Self-history for stroke		Self-history for transient ischemic attack		Stroke or TIA	
	n	%	n	%	n	%	n	%
Age Groups								
15-24	51	2,7	4	0,2	5	0,3	8	0,4
25-34	120	5,9	13	0,7	11	0,6	23	1,1
35-44	198	10,5	16	0,9	17	0,9	26	1,4
45-54	181	10,6	20	1,2	23	1,4	38	2,2
55-64	161	14,1	21	1,9	26	2,3	45	4,0
65-74	98	15,2	23	3,7	20	3,2	37	5,8
75+	43	9,7	37	8,6	18	4,3	49	11,1
NUTS1 Regions								
İstanbul	178	9,9	18	1,0	15	0,9	31	1,7
Western Marmara	40	8,9	4	0,9	7	1,6	11	2,4
Aegean	122	8,6	22	1,6	20	1,5	38	2,7
Eastern Marmara	86	9,3	17	1,9	15	1,7	28	3,0
Western Anatolia	80	8,0	16	1,7	14	1,4	28	2,8
Mediterranean	96	8,0	16	1,4	11	0,9	22	1,8
Central Anatolia	44	8,6	8	1,6	10	2,0	15	2,9
Western Black Sea	70	11,2	10	1,6	6	1,0	14	2,2
Eastern Black Sea	31	9,1	4	1,2	4	1,2	6	1,8
North Eastern Anatolia	20	8,0	4	1,6	3	1,2	4	1,6
Middle Eastern Anatolia	17	4,5	4	1,1	8	2,2	12	3,2
South Eastern Anatolia	66	8,1	10	1,3	9	1,2	18	2,2
Area of Residence								
Rural	245	9,0	43	1,6	40	1,5	72	2,6
Urban	587	8,6	89	1,3	80	1,2	153	2,2
Total	852	8,8	134	1,4	120	1,3	226	2,3
(%95 CI)		(8,2-9,3)		(1,2-1,7)		(1,1-1,5)		(2,1-2,7)
Total*		8,4		1,4		1,2		2,2
20-and-above	838	9,6	138	1,6	117	1,4	226	2,6
30-and-above	758	11,0	130	1,9	114	1,7	215	3,1

* Standardized using Turkey 2010 population

There are some differences in CVD prevalences by NUTS1 regions. For females, Eastern Marmara and Eastern Central Anatolia regions are the ones with prevalences above 3%. As for males, Western and Eastern Black Sea regions are the ones with the highest prevalences (Figure13.5). CVD prevalences in rural and urban areas of residence seem similar in both sexes.

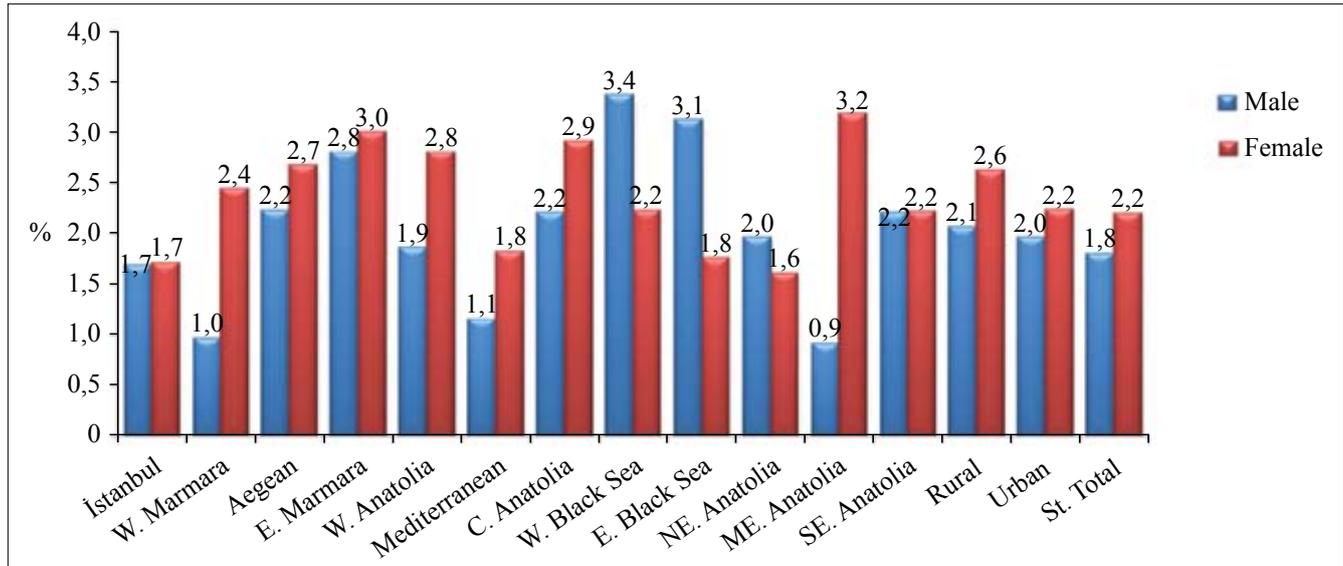


Figure 13.5 Cerebrovascular Disease Prevalence by sex and NUTS1 regions, Turkey 2011.

Percentage of being diagnosed with stroke and having medical report is 42% in males and 26% in females. Almost half of the participants who have stroke or TIA stated that they do not use any regular treatment for their condition (Table 13.8).

Table 13.8 Receiving medication in participants with stroke diagnosis by sex, Turkey 2011.

Regular medication use					
Sex	Have medical report, receive treatment	Do not have medical report, receive treatment	Do not receive treatment	Total	%
Male	42,1	15,9	42,1	107	100,0
Female	25,9	18,8	55,4	112	100,0
Total	33,8	17,4	48,9	219	100,0

Table 13.9 Distribution of treatment methods in participants with stroke history by sex, Turkey 2011.

Type of treatment	Males (n=110) %	Females (n=133) %
Antithrombotic Therapy	29,0	19,8
Medical treatment	63,0	58,0
Surgical treatment	6,2	6,2
Endarterectomy	0,0	2,2

Treatments used in stroke patients were also evaluated. In stroke patients 29% of males and 20% of females were given antithrombotic therapy in the acute phase. Approximately 6% of stroke patients in both sexes declared that they received surgical treatment for stroke (Table 13.9).



13.4 Discussion

Self reported data on coronary heart disease and stroke, which constitute the most important part of cardiovascular diseases, were presented in the Turkish Chronic Diseases and Risk Factors Survey. Angina pectoris defined as self report of a doctor diagnosis and Rose questionnaire was 6,4% in male and 9,8% in female. Self reported acute myocardial infarction prevalence was 2,3% in male and 1,1% in female.

In TURKSTAT Health survey self reported angina prevalence for over 15 years of age was slightly lower than the current study; 4,7% in male and 4,6% in female. Myocardial infarction history was 1,7% in male and 0,8% in female (2). When prevalences of two studies are compared, it's seen that prevalence of angina pectoris is slightly higher especially in female in Turkish Chronic Diseases and Risk Factors Survey.

Although cardiovascular diseases are considered important public health problems, national epidemiologic data on prevalence are quite limited. In TEKHARF Study in 2000, CHD prevalence for over 30 years of age was reported as 10,1% and incidence was 8.9 per thousand (4). However sampling method used in this study was not a probabilistic therefore these estimates should be interpreted cautiously.

CHD and stroke patients are entitled as candidates of medical and behavioral treatments named as secondary prevention measures to prevent complications and death.

CHD and stroke are chronic diseases that share common risk factors. If the risk factors are changed using medical therapies and life style changes development of these diseases can be prevented. Effectiveness of primary prevention was demonstrated in many studies and programs implemented in many countries (5,6). Primary prevention and secondary prevention that includes early detection, treatment and follow-up of patients, should be combined in a successful control programme. Treatment in CHD patients aims to prevent new recurrent coronary events, to control ischemia, to increase quality of life and prolong survival (7). Treatments in order to prevent a new coronary event or death in patients with known CVD, in other words, patients with a history of AMI or diagnosed coronary stenosis are called secondary prevention. In secondary prevention healthy diet, increase in physical activity, quitting smoking should be given with efficient medical therapies (7). In CHD patients, beta blockers, ACE inhibitors, lipid lowering drugs including statins and anti thrombotic drugs such as aspirin proven to prolong survival (8). However, there are still problems in providing secondary prevention treatments to the patients who are in need starting from prescription. In the EUROASPIRE III Study prescription of secondary prevention treatments were evaluated at the hospital discharge and then patients were invited to the controls after 6 months. Prescription rates at hospital discharge for antihypertensives, cholesterol lowering drugs and aspirin were between 80% in CHD patients aged between 18 and 80. However these levels were found quite lower because of a variety of reasons (9).

The effectiveness of chronic disease report in providing medications for chronic disease patients should be evaluated using health service research methods.

In Turkish Chronic Disease and Risk Factor Survey treatment use for both CHD and stroke patients were found quite low. There is still unmet need in providing secondary prevention treatments for CHD and stroke patients.



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14

Chronic Respiratory Diseases







14 Chronic Respiratory Diseases

Professor Gönül DİNÇ HORASAN

Key Findings

- Chronic obstructive pulmonary disease (COPD) was defined in two ways: the definition based on spirometry and the definition based on self reporting of a doctor diagnosis of COPD. Both definitions were also combined as “COPD prevalence based on self reporting of a doctor diagnosis or spirometry”.
- The age and sex standardized COPD prevalence according to the spirometry is 5.3% (5.6% in male and 5.1% in female). Of the participants, 1.8% has mild COPD, 2.2% is has moderate COPD, 0.8% has severe COPD, and 0.6% has very severe COPD.
- The age and sex standardized COPD prevalence based on self reporting of a doctor diagnosis is 4.0% (3.8% in male and 4.1% in female).
- COPD prevalence based on self reporting of a doctor diagnosis or spirometry is 5.0 % (4.9% in male and 5.1% in female).
- COPD is more common in rural areas than urban areas.
- COPD is more common in Western Black Sea, Eastern Marmara, North-eastern Anatolia, Eastern Central Anatolia, Eastern Black Sea and Aegean regions than other regions.
- 46.1% of COPD patients who reported of a doctor diagnosis use regular medication. Regular medication use is higher in older age groups, in rural areas and in some NUTS1 regions (Western Anatolia, Central Anatolia, Mediterranean, Western Black Sea and Western Marmara).
- The age and sex standardized asthma prevalence based on self reporting of a doctor diagnosis is 4.5% (2.8% in male and 6.2% in female).
- Asthma prevalence, based on self reporting of a doctor diagnosis is higher among female in all age groups. It is higher in rural areas than urban areas and in Central Anatolia, Western Black Sea, Eastern Black Sea and Western Anatolia than other NUTS1 regions.
- 62.2% of the asthma patients who reported a doctor diagnosis use regular medication.



14.1 Introduction

Chronic Respiratory Diseases (asthma and COPD) remains a major public health problem with a significant proportion in the burden of disease both globally and nationally and with their economic and social consequences. According to WHO estimates, COPD is the fourth leading cause of death in 2004 globally and accounts to 5.1% of deaths. COPD is projected to rank third in 2030 with an 8.6% percentage in burden of disease caused worldwide (1). COPD was found to rank eight with a 2.8% percentage in burden of disease caused in 2000 according to National Burden of Disease Study. Asthma was found to rank 14th with a 1.3% percentage in urban areas, and 9th with a 1.1% rate in rural areas in the same study (2).

For the prevention and control of non-communicable diseases (NCD), an action plan on NCDs is intended to support coordinated, comprehensive and integrated implementation of strategies and evidence-based interventions across individual diseases and risk factors, especially at the national and regional levels by World Health Organization (WHO). The Global Alliance against Chronic Respiratory Diseases (GARD) has been developed and it is making every attempt to align with WHO's non-communicable diseases action plan. The goals of the GARD project are in line with the GARD action plan to prevent and control chronic respiratory diseases, to reduce their mortality and morbidity, and to reduce the social and economical burden of these diseases (3). GARD Turkey Project, "Chronic Respiratory Diseases Prevention and Control Program and National Action Plan", was developed and have been implemented by the Ministry of Health (MoH) and the Turkish Thoracic Society (TTS) between 2009 and 2013 (4). In the control program, the monitoring of epidemiologic data such as COPD and asthma specific prevalence was planned in order to evaluate the effectiveness of the program (4).

The only national data source for COPD and asthma prevalence in Turkey is the National Burden of Disease Health Survey conducted in 2000. This study reported COPD prevalence as 10.2% (8.4% in male and 11.9% in female), and asthma prevalence as 3.8% (3.1% in male and 4.4% in female) (2). The COPD prevalence was found 19.5% in adults above 40 years of age ($FEV_1/FVC < 70$) (28.5% in male and 10.3% in female) in 2004 in Adana, one of the centres selected for the BOLD study, one of the international COPD prevalence studies (4). Since there is no current national data on COPD and asthma prevalence, this study aimed to obtain COPD and asthma prevalence.

14.2 Methods and Definitions

COPD and Asthma Based on Self Reporting of a Doctor Diagnosis and Treatment

The individuals were asked if they had been diagnosed with COPD or asthma by a doctor, whether they had been using regular medication due to these diseases and if they had been, whether they have medical report.

COPD Definition Based on Post-Bronchodilator Spirometry

Family physicians (FPs) directed the participants to a health institution, generally state hospitals, to perform a spirometry test. The spirometry results have been brought by the participants to their family physicians



and then recorded into the electronic survey form. The FPs were requested to enter pre-bronchodilator FEV1/FVC(%), pre-bronchodilator FEV1(%), pre-bronchodilator FVC(%), post-bronchodilator FEV1/FVC(%), post-bronchodilator FEV1(%) and post-bronchodilator FVC(%). In order the spirometry results to be correctly transferred into the survey form, the outputs of various spirometry devices were scanned and these outputs were added to the section in which the spirometry results were written.

COPD was defined as post-bronchodilator FEV1/FVC<0.70. COPD severity was staged using GOLD criteria (Table 14.1) (5).

Table 14.1 COPD severity stages based on spirometry, Turkey 2011.

COPD severity stage	Pre-bronchodilator FEV1/FVC (%)	Post-bronchodilator FEV1 (%)
Mild COPD	<70	≥80
Moderate COPD	<70	50-79
Severe COPD	<70	30-49
Very severe COPD	<70	<30

Source: Global Initiative for Chronic Obstructive Lung Disease (5)

During data analysis, some incorrect data were detected, and the incorrect data limits were defined after consulting to the experts. For pre-bronchodilator and post-bronchodilator measurements, values below 5 and above 120 for FEV1/FVC (%), values below 5 for FEV1 (%) were accepted as incorrect and were not included the analysis. Table 14.2 presents the distribution of incorrect data in pre-bronchodilator and post-bronchodilator measurements. Only 35.7% of pre-bronchodilator measurements and 22.6% of post-bronchodilator measurements were in range plausible.

Since suggested COPD definition based on post-bronchodilator measurements, the analyses were conducted on the data obtained from 4171 individuals.

Table 14.2 Distribution of incorrect data in spirometry measurements, Turkey 2011.

	Pre-bronchodilator		Post-bronchodilator	
	n	%	n	%
No FEV1/FVC data	8811	47,7	12310	66,6
FEV1/FVC% <5	907	4,9	620	3,4
FEV1/FVC% >120	340	1,8	262	1,4
FEV1/FVC %≥5 - ≤120	8419	45,6	5285	28,6
Total	18477	100,0	18477	100,0
FEV1/FVC %≥5 - ≤120				
No FEV1% data	42	0,2	103	0,6
FEV1% value <5	1773	9,6	1011	5,5
FEV1% value ≥5 (analysis group)	6604	35,7	4171	22,6



COPD definition based on self reporting of a doctor diagnosis or spirometry

COPD definition based on self reporting of a doctor diagnosis and COPD definition based on spirometry were combined as “COPD definition based on self reporting of a doctor diagnosis or spirometry”

14.3 Findings

The age and sex standardized COPD prevalence according to spirometry is 5.3% (5.6% in male and 5.1% in female). Of the participants, 1.8% mild COPD, 2.2% is has moderate COPD, 0.8% have severe COPD, and 0.6% has very severe COPD (Table 14.3, 14.4). The age and sex standardized COPD prevalence based on self reporting of a doctor diagnosis is 3.8% in male and 4.1% in female. COPD prevalence based on self reporting of a doctor diagnosis or spirometry is 4.9% in male and 5.1% in female (Table 14.3).

Table 14.3 COPD and asthma prevalence by sex, Turkey 2011.

Sex	COPD prevalence (%)*			Asthma prevalence (%)*
	COPD** based on spirometry	COPD doctor diagnosed	COPD doctor diagnosed or spirometry	Asthma doctor diagnosed
Male	5,6	3,8	4,9	2,8
Female	5,1	4,1	5,1	6,2
Total	5,3	4,0	5,0	4,5

*Standardized using Turkey 2010 population

**COPD prevalence based on spirometry was calculated for 4171 individuals (weighted 3815 individuals) other rates were calculated for 18477 individuals.

Table 14.4 COPD stage distribution based on post-bronchodilator spirometry, Turkey 2011.

	Number	%
COPD Stage		
Mild COPD	70	1,8
Moderate COPD	85	2,2
Severe COPD	31	0,8
Very severe COPD	24	0,6
No COPD	3605	94,5
Total	3815	100,0

For both COPD definitions, COPD prevalence increases with age, and COPD prevalence is higher in male than female in age groups older than 45 years. The difference observed in COPD prevalence between male and female is more according to spirometry evaluation (Table 14.5, Table 14.6, Figure 14.1 and Figure 14.3). In both sexes, COPD prevalence according to area of residence and NUTS1 regions shows



similar pattern; COPD is more common in rural areas than urban areas; more common in Black Sea and Western regions than other regions (Table 14.5, Table 14.6, Figure 14.2 and Figure 14.4).

Table 14.5 COPD and Asthma prevalence in male by age, area of residence and NUTS1 regions, Turkey 2011.

Characteristics	COPD based on spirometry		COPD doctor diagnosed		COPD doctor diagnosed or spirometry		Asthma doctor diagnosed	
	n	%	n	%	n	%	n	%
Age groups								
15-24	14	4,3	14	0,8	29	1,7	29	1,7
25-34	14	3,7	23	1,3	37	2,0	31	1,7
35-44	17	4,8	54	3,2	70	4,1	62	3,7
45-54	21	6,4	84	5,8	101	7,0	48	3,3
55-64	22	9,4	76	7,2	96	9,0	38	3,6
65-74	14	11,6	67	11,6	78	13,4	31	5,4
75 +	5	7,1	51	15,3	56	16,8	17	5,2
NUTS1 Regions								
İstanbul	5	5,0	66	4,2	68	4,3	44	2,8
Western Marmara	7	6,4	17	4,1	23	5,6	10	2,4
Aegean	20	5,1	55	4,8	73	6,4	30	2,6
Eastern Marmara	19	8,4	28	3,3	44	5,2	23	2,7
Western Anatolia	9	4,6	33	4,2	41	5,2	26	3,3
Mediterranean	13	4,9	38	3,4	51	4,6	33	3,0
Central Anatolia	5	4,6	18	4,1	22	4,9	15	3,4
Western Black Sea	18	13,2	29	5,3	45	8,2	20	3,6
Eastern Black Sea	2	2,4	23	7,3	25	8,0	13	4,2
North Eastern Anatolia	4	11,1	18	7,3	21	8,5	10	4,0
Eastern Central Anatolia	6	7,7	15	3,5	21	4,9	8	1,9
South Eastern Anatolia	1	1,2	32	4,3	33	4,4	23	3,1
Area of residence								
Rural	47	7,9	122	4,8	166	6,5	82	3,2
Urban	60	5,0	245	4,1	298	5,0	169	2,9
Total	109	5,9	372	4,3	467	5,4	255	3,0
%95 CI		(4,8-7,0)		(3,9-4,7)		(4,9-5,9)		(2,6-3,3)



Table 14.6 COPD and Asthma prevalence in female by age, area of residence and NUTS1 regions, Turkey 2011.

Characteristics	COPD based on spirometry		COPD doctor diagnosed		COPD doctor diagnosed or spirometry		Asthma doctor diagnosed	
	n	%	n	%	n	%	n	%
Age groups								
15-24	17	4,6	23	1,2	40	2,2	41	2,2
25-34	19	4,8	29	1,5	47	2,4	76	3,8
35-44	24	5,6	60	3,3	83	4,5	123	6,7
45-54	8	2,2	83	4,9	91	5,4	155	9,2
55-64	19	7,5	88	7,9	104	9,3	113	10,1
65-74	11	8,3	65	10,4	75	11,9	57	9,1
75 +	4	5,5	62	14,4	65	15,0	49	11,4
NUTS1 Regions								
İstanbul	5	4,5	71	4,0	76	4,3	117	6,5
Western Marmara	6	5,8	22	5,0	27	6,1	28	6,3
Aegean	25	5,3	76	5,5	98	7,1	83	6,0
Eastern Marmara	14	6,4	46	5,0	58	6,3	53	5,8
Western Anatolia	8	3,5	33	3,4	41	4,2	69	7,1
Mediterranean	11	3,6	29	2,4	39	3,3	73	6,1
Central Anatolia	7	5,1	24	4,7	31	6,1	43	8,5
Western Black Sea	19	13,2	31	5,0	49	7,9	48	7,8
Eastern Black Sea	1	1,0	13	3,9	14	4,2	22	6,5
North Eastern Anatolia	0	0,0	14	5,7	14	5,7	8	3,3
Middle Eastern Anatolia	3	4,2	18	4,9	21	5,7	24	6,5
South Eastern Anatolia	5	6,0	32	4,1	37	4,7	46	5,8
Area of residence								
Rural	40	7,0	133	5,0	170	6,3	190	7,1
Urban	61	4,3	264	3,9	321	4,8	407	6,1
Total	104	5,1	409	4,3	505	5,3	614	6,4
%95 CI		(4,1-6,0)		(3,9-4,7)		(4,8- 5,7)		(5,9-6,9)

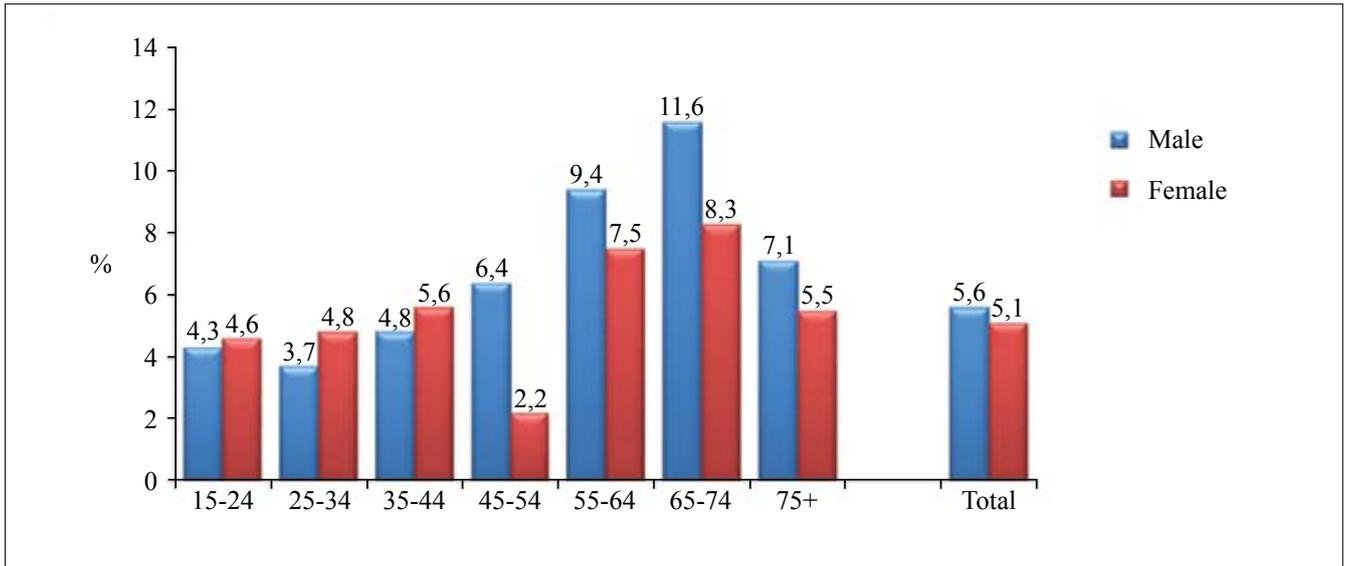


Figure 14.1 COPD prevalence based on post-bronchodilatator spirometry by age and sex, Turkey 2011.

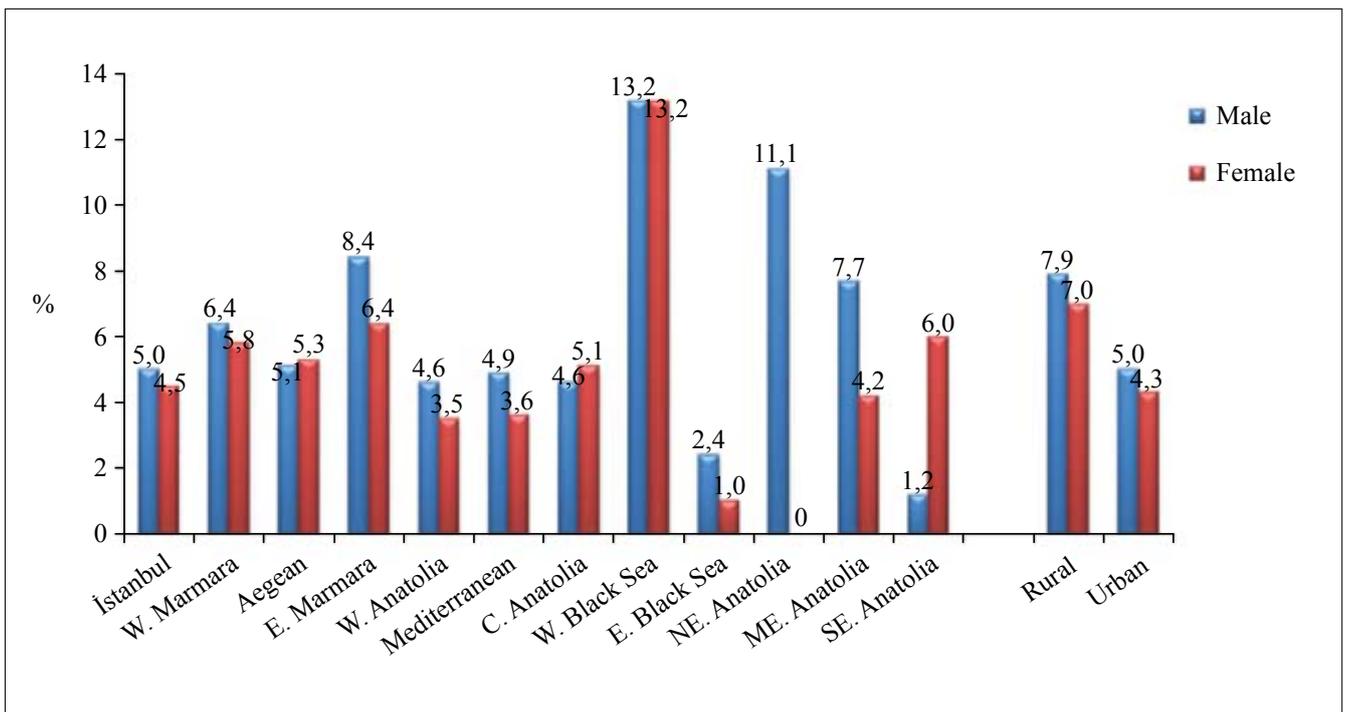


Figure 14.2 COPD prevalence based on post-bronchodilatator spirometry by area of residence and NUTS1 regions, Turkey 2011.

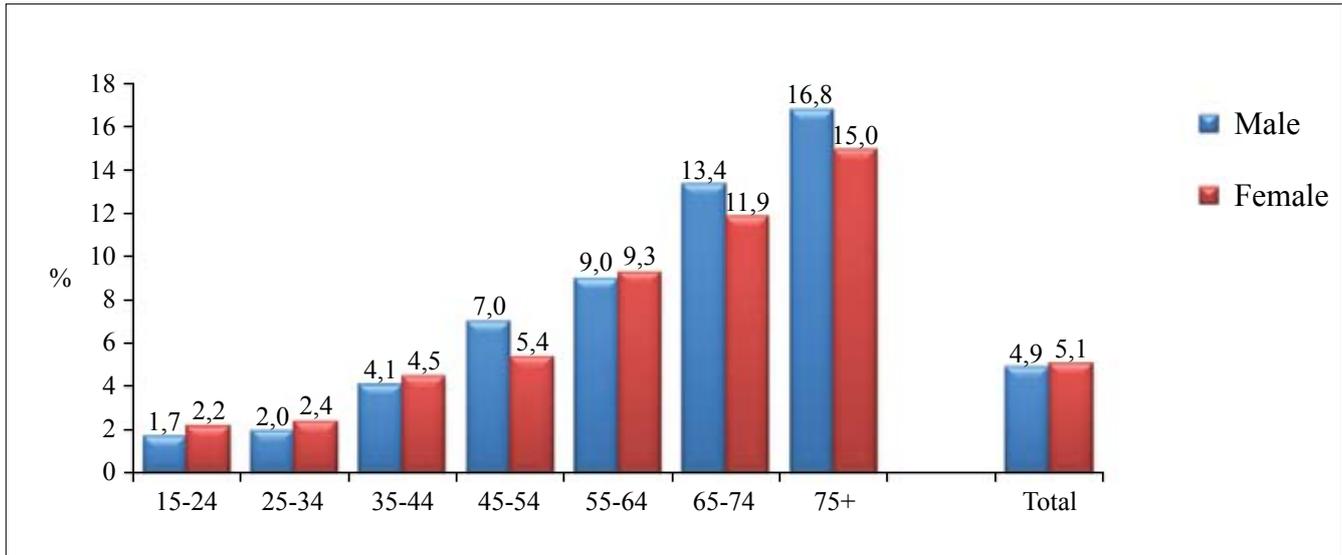


Figure 14.3 COPD prevalence based on self reporting of a doctor diagnosis or spirometry by age and sex, Turkey 2011.

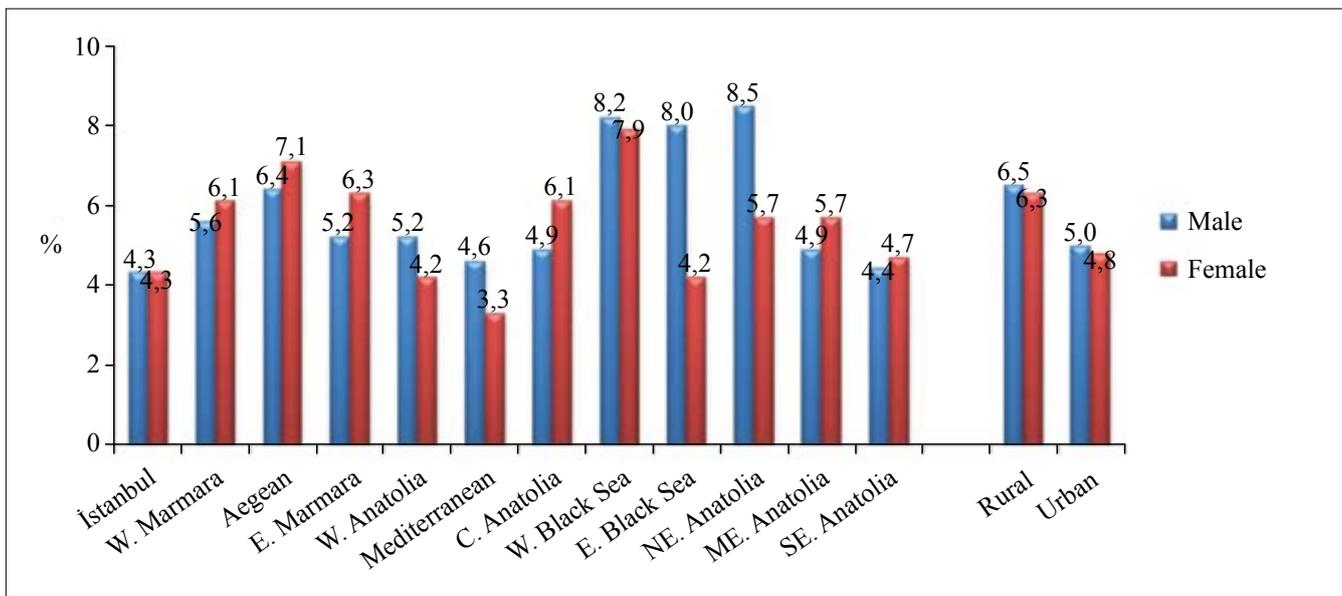


Figure 14.4 COPD prevalence based on self reporting of a doctor diagnosis or spirometry by area of residence and NUTS1 regions, Turkey 2011.

Among COPD patients who reported of a doctor diagnosis, 29% use regular medication with medical report and 17.1% use regular medication without medical report; in other words, 46.1% of COPD patients who reported of a doctor diagnosis use regular medication. Regular medication use is higher in older age groups, in rural areas and in some NUTS1 regions (Western Anatolia, Central Anatolia, Mediterranean, Western Black Sea and Western Marmara) (Table 14.7).



Table 14.7 Medication use among COPD patients by age, sex, NUTS1 regions and area of residence, Turkey 2011.

Regular medication use in COPD patients					
	Have medical report, use treatment	Do not have medical report, use treatment	Do not use treatment	Total (n)	Total %
Sex					
Men	32,4	14,6	53,0	336	100.0
Female	25,9	19,0	55,1	379	100.0
Age Groups					
15-24	3,2	29,0	67,7	31	100.0
25-34	8,9	15,6	75,6	45	100.0
35-44	21,9	16,2	61,9	105	100.0
45-54	25,4	11,3	63,4	142	100.0
55-64	30,8	18,2	50,9	159	100.0
65-74	41,6	19,2	39,2	125	100.0
75+	39,3	17,8	43,0	107	100.0
NUTS1 Regions					
İstanbul	20,8	15,2	64,0	125	100.0
Western Marmara	27,8	25,0	47,2	36	100.0
Aegean	31,7	15,8	52,5	120	100.0
Eastern Marmara	25,8	16,7	57,6	66	100.0
Western Anatolia	36,9	20,0	43,1	65	100.0
Mediterranean	37,7	16,4	45,9	61	100.0
Central Anatolia	35,0	25,0	40,0	40	100.0
Western Black Sea	39,3	12,5	48,2	56	100.0
Eastern Black Sea	32,4	14,7	52,9	34	100.0
North Eastern Anatolia	14,8	22,2	63,0	27	100.0
Middle Eastern Anatolia	12,5	31,3	56,3	32	100.0
South Eastern Anatolia	26,8	7,1	66,1	56	100.0
Area of residence					
Rural	30,5	19,2	50,2	239	100.0
Urban	28,9	16,3	54,9	461	100.0
Total	29,0	17,1	53,9	714	100.0



The age and sex standardized asthma prevalence based on self reporting of a doctor diagnosis is 2.8% in male and 6.2% in female (Table 14.3). Asthma prevalence is higher among female in all age groups; the female in 45-64 age group were reported as having asthma almost 3 times more than men. Asthma prevalence is higher in rural areas than urban areas and in Central Anatolia, Western Black Sea, Eastern Black Sea and Western Anatolia than other NUTS1 regions (Table 14.5, Table 14.6, Figure 14.5 and Figure 14.6).

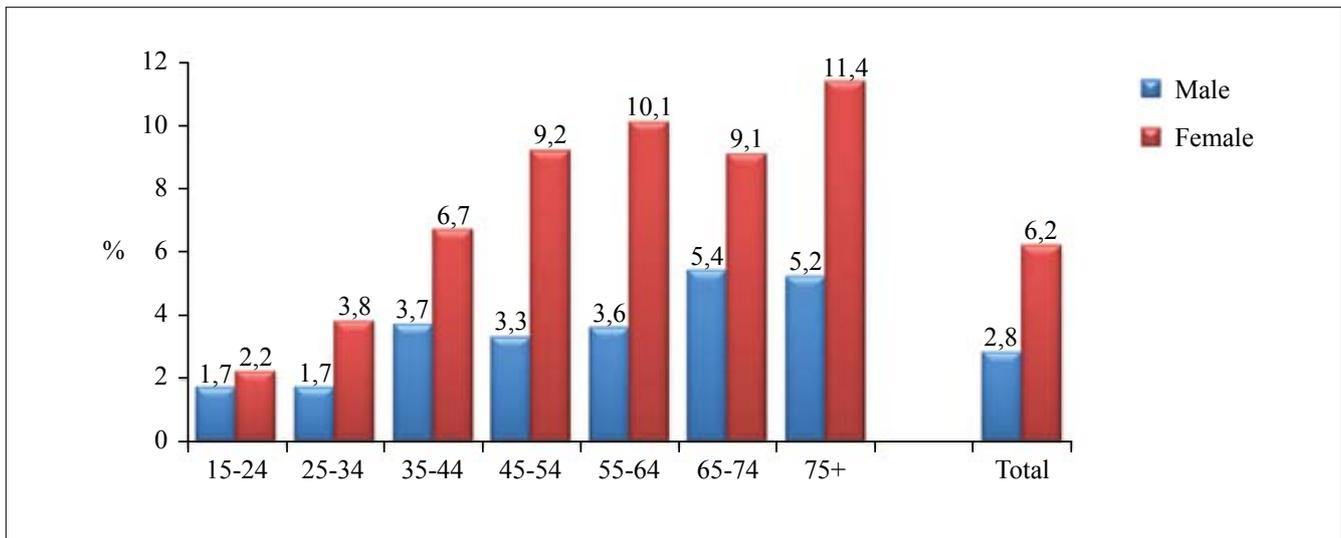


Figure 14.5 Asthma prevalence based on self reporting of a doctor diagnosis by age and sex, Turkey 2011

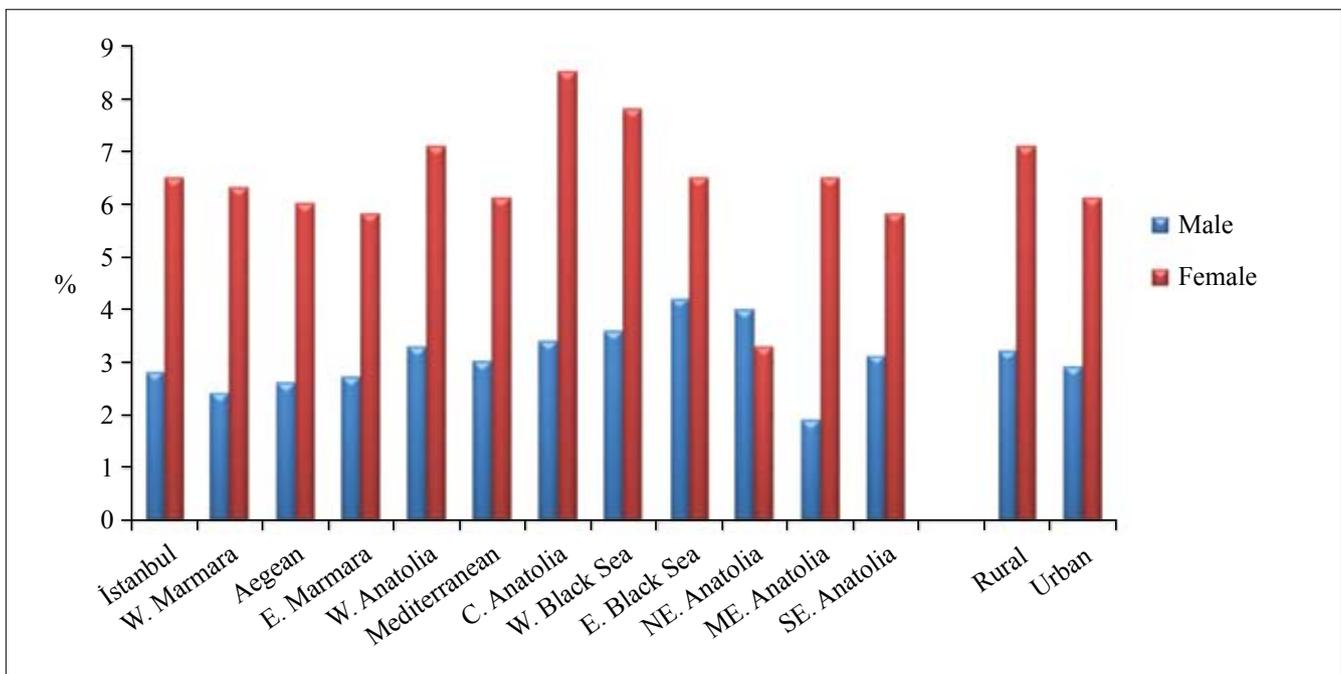


Figure 14.6 Asthma prevalence based on self reporting of a doctor diagnosis by area of residence and NUTS1 regions, Turkey 2011.



Among asthma patients who reported of a doctor diagnosis, 40.8% use regular medication with medical report, and 21.4% use regular medication without medical report; in other words, 62.2% of asthma patients who reported of a doctor diagnosis use regular medication. Regular medication use is higher in older age groups, in the Mediterranean and North-eastern Anatolia (Table 14.8).

Table 14.8 Medication use among asthma patients by sex, age, NUTS1 regions and area of residence, Turkey 2011.

Regular medication use in asthma patients					
	Have medical report, use treatment	Do not have medical report, use treatment	Do not use treatment	Total (n)	Total %
Sex					
Male	40,7	22,0	37,4	246	100,0
Female	40,9	21,2	37,9	575	100,0
Age groups					
15-24	23,2	26,1	50,7	69	100,0
25-34	25,5	25,5	49,0	98	100,0
35-44	36,6	17,1	46,3	175	100,0
45-54	43,5	22,8	33,7	193	100,0
55-64	41,1	24,7	34,2	146	100,0
65-74	64,6	16,5	19,0	79	100,0
75+	57,4	14,8	27,9	61	100,0
NUTS1 Regions					
İstanbul	30,6	27,4	42,0	157	100,0
Western Marmara	44,4	19,4	36,1	36	100,0
Aegean	40,2	20,6	39,3	107	100,0
Eastern Marmara	34,3	25,7	40,0	70	100,0
Western Anatolia	48,3	13,8	37,9	87	100,0
Mediterranean	52,0	21,0	27,0	100	100,0
Central Anatolia	35,8	24,5	39,6	53	100,0
Western Black Sea	50,0	11,3	38,7	62	100,0
Eastern Black Sea	41,2	23,5	35,3	34	100,0
North Eastern Anatolia	44,4	27,8	27,8	18	100,0
Middle Eastern Anatolia	48,4	6,5	45,2	31	100,0
South Eastern Anatolia	34,9	27,0	38,1	63	100,0
Area of residence					
Rural	41,6	20,4	38,0	255	100,0
Urban	41,3	22,1	36,5	542	100,0
Total	40,8	21,4	37,8	818	100,0



14.4 Discussion

14.4.1 COPD

In this study, age and sex standardized COPD prevalence based on spirometry is found 5.3%. Age standardized COPD prevalences are 5.6% in male and 5.1% in female. In a meta-analysis of the 32 population based studies published between 1990 and 2001, COPD prevalence among over 40 years was reported between 9-10% (4). The studies show remarkable variations due to the differences in survey methods (age distribution of study samples, response rate), diagnostic criteria (self report of a doctor diagnosis of COPD, spirometry with or without a bronchodilator, questionnaires that ask about respiratory symptoms), so it is quite difficult to conclude to what extent the variation in the COPD prevalence data is caused by the different distribution of risk factors and to what extent it is caused by the differences in the studies' methodology. Two international studies gave more reliable information about COPD prevalence. One of them is the PLATINO (Proyecto Latinoamericano de Investigación en Obstrucción Pulmonar) study conducted in five cities in South America (6), and the other one is BOLD study, a multi centre study conducted in 18 different countries (7). In PLATINO study, similar to the Turkey Chronic Diseases and Risk Factors Survey, same diagnostic criteria based on post-bronchodilator spirometry ($FEV_1/FVC < 70\%$) was used for COPD diagnosis. In PLATINO study, COPD prevalence in the population over 40 years was found 18% in Brazil, 11% in Mexico, 27% in Uruguay, 23% in Chile and 26% in Venezuela (6). In BOLD study, a definition of moderate COPD and higher was used, and COPD prevalence was found 10.1% among people over 40 years (11.8% in male and 8.5% in female) (7). COPD prevalence was found 19.1% with a definition of stage 1 and higher ($FEV_1/FVC < 70\%$) (28.5% in male and 10.3% in female) in the population over 40 years in 2004 Adana, one of the research centres in BOLD study; with a definition of stage 2 and higher the prevalence was found 10.5% (15.4% in male and 6.0% in female) (4). In the Turkey Chronic Diseases and Risk Factors Survey, COPD prevalence with a definition of stage 1 and higher was found 6.4% in the population over 40 years (7.6% in male and 5.3% in female); and it was found 4.5% (5.4% in male and 3.6% in female) with a definition of stage 2 and higher. COPD prevalences of the Turkey Chronic Diseases and Risk Factors Survey are quite lower than Adana study when the same age group and same criteria are used.

Additionally, in both studies conducted in other countries and in Adana, higher COPD prevalence rates were found in male than female, due to more prevalent smoking rates among men. In Turkey smoking prevalence is 50.6% for male and 16.6% for female, so a greater difference could be expected in the COPD prevalences for male and female than that was found in the Turkey Chronic Diseases and Risk Factors Survey (4). Higher prevalence rates were also found in other studies conducted to determine the COPD prevalence in Turkey. In the National Burden of Disease Study in 2000, COPD prevalence was found 10.2% (8.4% in male and 11.9% in female) (2). In another study conducted in Balçova/Izmir in 2007, COPD prevalence with a diagnostic criteria $FEV_1/FVC < 70\%$ based on spirometry without a bronchodilator was found 11,8% among the population over 40 years old (15,6% in men, 6,3% in female) (8). In another study conducted in the rural areas of Kayseri among the population over 20 years, using the ECRHS (European Community Respiratory Health Survey) questionnaire, chronic bronchitis prevalence was found 13.5% (17.8% in male and 10.0% in female) (4).



The age and sex standardized COPD prevalence based on self reporting of a doctor diagnosis is 4.0%. This prevalence is approximately 1.3% lower than the COPD prevalence based on spirometry. The patients in stage I are known asymptomatic cases. In this study, the patients in stage I comprise 1.8% of the individuals who have a spirometry measurements. These results show a consistency between the COPD prevalences based on self reporting of a doctor diagnosis and based on post-bronchodilator spirometry. However, the similarity of COPD prevalences in male and in female in all age groups raise suspicion about the validity of these results, since smoking is more common in male than female. This may be caused by higher use of health services by female, compared to male (9).

In conclusion, lower COPD prevalence was found in the Turkey Chronic Diseases and Risk Factors Survey compared to the previous studies in Turkey. Selection bias may occur in the estimation of COPD prevalence based on spirometry. Since the spirometry measurements were done by different health institutions, calibration of spirometry device or training of the technicians was not possible and this might have affected the results. Special studies intended at determining COPD prevalence may be suggested, since the results of other studies in Turkey are also inconsistent.

COPD prevalence according to both definitions used, increases with age. Age was also reported as an important risk factor for COPD prevalence in PLATINO and BOLD studies. It was found, in BOLD study, that every 10 years in age increased COPD risk by 1.94% (6,7). COPD prevalence according to spirometry is higher in rural areas than urban areas, and in Western Black Sea, Eastern Central Anatolia, South-eastern Anatolia, and Eastern Marmara than other NUTS1 regions.

In total 46.1% patients who reported of a doctor diagnosed COPD use regular medication. Both national and international studies indicate that the rates for access to diagnosis and treatment for COPD patients are inadequate. In the BOLD study conducted in Adana, it was found that only 12.3% of the COPD patients used medication (4).

14.4.2 Asthma

The age and sex standardized asthma prevalence based on self reporting of a doctor diagnosis is 4.5% (2.8% in male and 6.2% in female). In the studies conducted in Turkey to determine the asthma prevalence in adults, asthma was diagnosed generally by using the ECRHS questionnaire, and asthma prevalence was found between 2% and 6% (4). Asthma prevalence in the population over 18 years was found 3.8% in the National Burden of Disease Study (2). Although the asthma diagnosis was based on self reporting of a doctor diagnosis in the Turkey Chronic Diseases and Risk Factors Survey, the asthma prevalence obtained in the study is quite similar to the prevalences of the studies which used reliable diagnostic criteria such as the ECRHS questionnaire. This may be caused by the well recognition of the diseases by the people due to its specific symptoms. In the Chronic Respiratory Diseases Prevention and Control Program and National Action Plan, it is aimed to increase accessibility of the treatment in asthma cases. It was found that almost 60% of the asthma patients, reported of a doctor diagnosis, used regular medication. Accessibility to treatment in asthma patients should be increased.



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15

**Other
Noncommunicable
Diseases and Accidents**





15 Other Noncommunicable Diseases and Accidents

Professor Gül ERGÖR

Key Findings

- Non-communicable disease prevalence is given based on self-report of the participants.
- Dementia prevalence is 5% in 65-and-above age group.
- Parkinson's Disease prevalence is 3‰, and in 65-and-above group it is 2%.
- Epilepsy prevalence is 7‰.
- Allergic diseases are seen in 11% of the 15-and-above population.
- Gastroesophageal reflux prevalence is 15%.
- Cancer prevalence is 3% in 65-and-above age group, and 1% in the whole study population.
- Prevalence of all accidents is 3%. 1.2% of the accidents are home accidents, 1,6% are traffic accidents and 0.5% are occupational accidents.



15.1 Introduction

The most significant ones among non-communicable disease are the cardiovascular diseases, diabetes and COPD. Diseases in this group, except the aforementioned ones, neurological diseases such as Parkinson’s disease, epilepsy, dementia, allergic diseases and gastroesophageal reflux, which constitute a substantial amount of disease burden, but which are rare, will be discussed in this chapter. Tuberculosis, also, will be discussed in this chapter since it is a chronic disease, despite being a communicable one. Although cancers are discussed separately from the non-communicable diseases since they cover a vast group of diseases, they will be presented in this chapter in general. The prevalence of non-communicable diseases globally, and in various regions of the world are presented in Table 15.1.

Table 15.1 Prevalence of some NCDs globally and regionally, Turkey 2011.

Disease	Publication Date	Reference(no)	Country/ Region	Prevalence
Tuberculosis	2010	Ministry of Health (1)	Globally	178 per 100 000
Traffic accident	2009	WHO (2)	Globally	18.8 per 100 000
Occupational accident	2011	WHO (3)	Globally	10.7 per 100 000
Home accident	2004	WHO (3)	Globally	4.5 %
Cancer	2002	Micheli A, (4)	Europe	1367 per 100 000
Cancer	2008	Ferlay J, (5)	Globally	586 per 100 000
Epilepsy	2009	Sander J, (6)	Europe, USA	3–8 per 1000
Parkinson’s disease	2005	Campenhausen, (7)	Europe	66 - 270 per 100 000
Dementia	2005	Lobo A, (8)	Europe	4-221 per 1000 (60-90 age)
Dementia	1999	Lobo A, (8)	USA	1-6% age 65 and above 10-20% age 80 and above
Gastro-oesophageal Reflux	2006	Jin-Hai Wang, (9)	Asia	2.5-6.7%
Gastro-oesophageal Reflux	2000	Kennedy t, (10)	UK	28.7%
Gastro-oesophageal Reflux	2004	Jin-Hai Wang, (9)	China	17%
Allergic symptoms	2002	Şakar A, (11)	Europe	10-40%

These diseases have not been investigated in our country due to their low prevalence and incidence. There is not any reliable information about the prevalence of these diseases, since the hospital information systems had not been configured to calculate prevalence and incidence. Information on the prevalence of these diseases in Turkey was obtained from small-scale studies.

Neurological diseases appear as frequent health issues with aging, although they are not frequent in the society. In a study, conducted in Bursa, epilepsy prevalence was found 8.5%, and lifelong prevalence was



found 12.2‰ (12); lifelong prevalence was found 0.8% in a study conducted in İstanbul (13). Dementia prevalence was found 8.4% in 55-and-above age group in a study conducted in Eskişehir (14). It was found 15/ten thousand in Sivas and 11/ten thousand in Eskişehir (15).

Gastro-oesophageal reflux is the most prevalent gastrointestinal complaint encountered in primary healthcare. Prevalences up to 20% were found in adult population in local studies (16). Allergic symptoms, too, emerge as one of the most prevalent issues in primary health care. These symptoms are seen with other diseases especially asthma. In a cross-sectional study, conducted in Manisa, atopy, allergic rhinitis and dermatitis showed prevalence between 11% and 15% (11). Tuberculosis has been on the rise again in the world recently; according to the surveillance in our country, there is a decline in both incidence and prevalence. Tuberculosis prevalence was reported as 24 per one hundred thousand according to the 2009 records (1).

Accidents come forward as the preeminent cause of death especially in young adults. One out of ten deaths in the world is caused by accidents. Accidents were investigated under three categories as traffic, occupational and home accidents. According to TURKSTAT data, traffic accident prevalence is 5.5 per one hundred thousand, and occupational accident prevalence is around 6.2‰ (17, 18). According to some cross-sectional studies, home accident prevalence in Turkey was found 20% to 25% (19-21).

According to the data from the 8 Cancer Registries in our country, cancer incidence is 210 per one hundred thousand in males, and 129 per one hundred thousand in females (22). Estimations from a study in our country, cancer prevalence is 406 per one hundred thousand (23).

15.2 Methods and Definitions

For the diseases discussed in this chapter individuals were asked the question “Do you have any of the chronic diseases or conditions below, diagnosed by a physician?” If the answer was yes, the individuals were asked whether they used medications regularly or if they had medical reports. Allergic diseases were explained as rhinitis, pollen allergy, eczema-dermatitis, food allergy and medicine allergy. The prevalences presented in this chapter are based on self-reports. When the denominators of percentages in the tables were less than 50 then percentages were given in parenthesis.

15.3 Findings

Dementia prevalence was found 8‰ in 15-and-above population. Its prevalence is 5% in 65-and-above age group. There is no difference between males and females in terms of dementia prevalence. Epilepsy prevalence was found 7‰. A slight decrease with aging was found, but no difference was found with regard to sex and area of residence. Parkinson’s disease prevalence was found 3‰, and prevalence in 65-and-above age group was found 2% (Figure 15.1, 15.4, 15.5; Table 15.2).

Allergic diseases are prevalent in 11% of the 15-and-above population. It was reported as 13% in females and 8% in males. Prevalence of allergic diseases increased slightly with age, and decreased slightly in 65-and-above age group. Gastro-oesophageal reflux prevalence is 15%. It increases up to 19% in 35-and-above age group. It is more prevalent in females, but there is no difference between rural and urban areas of residence (Figure 15.1, 15.4, 15.5; Table 15.2).

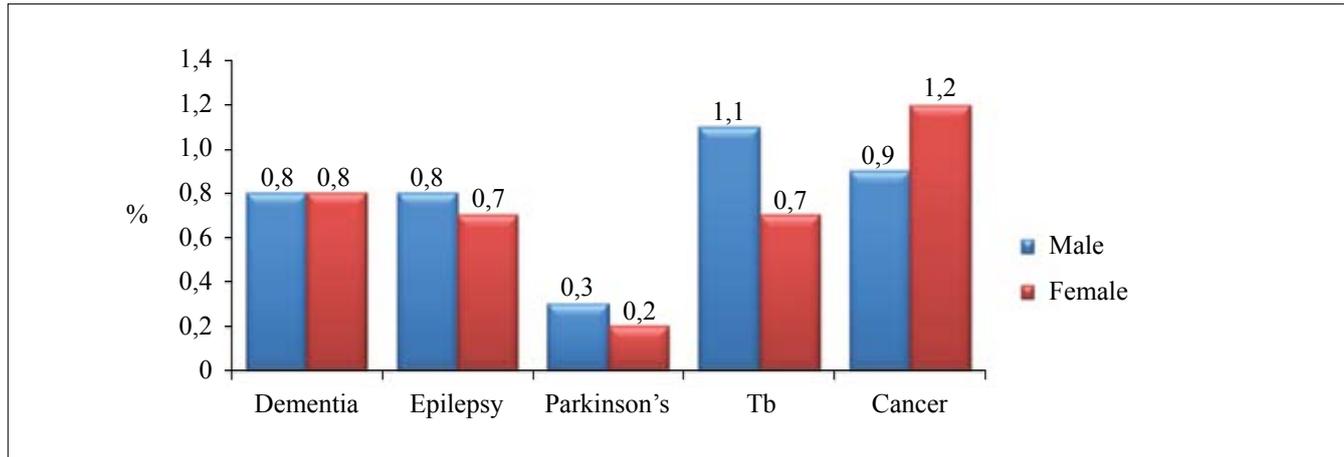


Figure 15.1 Prevalences for some NCDs by sex, Turkey 2011.

Tuberculosis prevalence is 9%. It would be more appropriate to interpret this finding as life-long tuberculosis diagnosis; individuals who had been diagnosed with tuberculosis in any period of their lives answered this question as yes. Higher prevalence was reported in males and individuals who live in urban areas (Figure 15.1, 15.4, 15.5; Table 15-2).

Table 15.2 Prevalence of some noncommunicable diseases by age, sex and area of residence, Turkey 2011.

	Number	Dementia	Epilepsy	Parkinson's Dis.	Allergy	GE Reflux	TB	Cancer
Age groups								
15-34	7462	-	0,8	-	9,9	9,8	(0,5)	(0,2)
35-64	8999	(0,4)	0,7	(0,1)	11,7	19,4	1,1	1,2
> 65	2015	4,8	(0,6)	(1,9)	8,5	18,5	(1,4)	3,2
Male	8761	0,8	0,8	(0,3)	8,3	13,3	1,1	0,9
Female	9715	0,8	0,7	(0,2)	13,0	17,3	0,7	1,2
Rural	5335	(0,9)	(0,8)	(0,2)	9,6	15,1	(0,6)	(0,8)
Urban	12825	0,7	0,7	(0,3)	11,3	15,6	1,0	1,1
Total	18477	0,8	0,7	0,3	10,8	15,4	0,9	1,1
% 95 CI		0,6-0,9	0,6-0,9	0,2-0,4	10,3-1,2	14,9-16,0	0,7-1,0	0,9-1,2

Cancer prevalence is 3% in 65-and-above age group and 1% in the whole group. It is slightly higher in females than males (1.2% and 0.9% respectively) (Figure 15.1, 15.4, 15.5; Table 15.2). In females, breast cancer comes first in prevalence, followed by cervix and corpus uteri cancers (Figure 15.2). In males prostate cancer comes first in prevalence and followed by colon-rectum and NH lymphoma cancers (Figure 15.3).

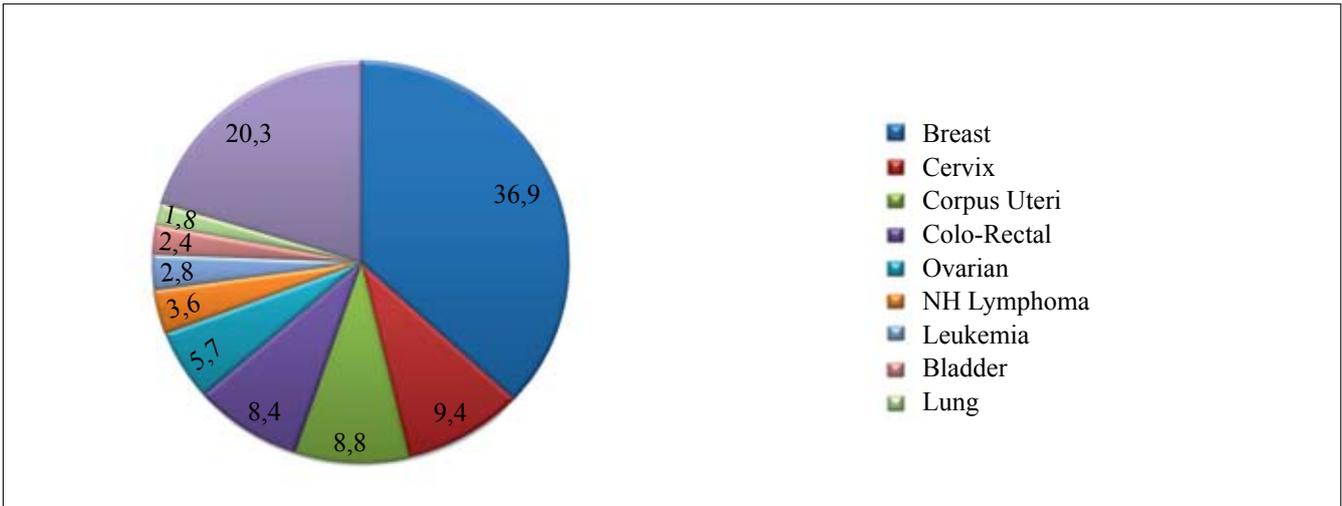


Figure 15.2 Percentage distributions of cancer types in females, Turkey 2011.

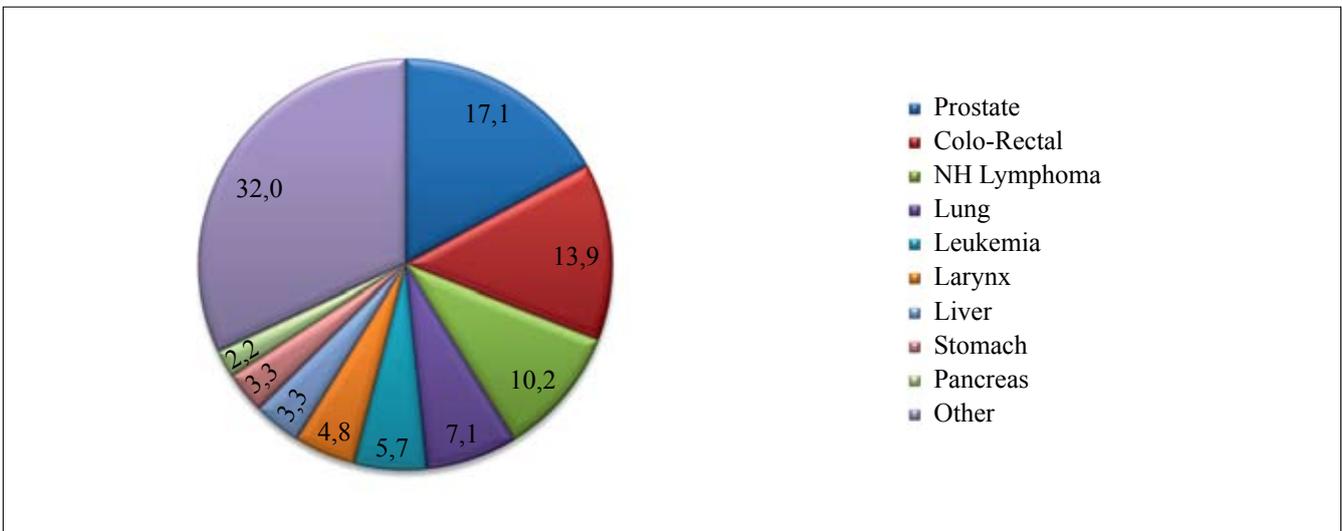


Figure 15.3 Percentage distribution of cancer types in males, Turkey 2011.

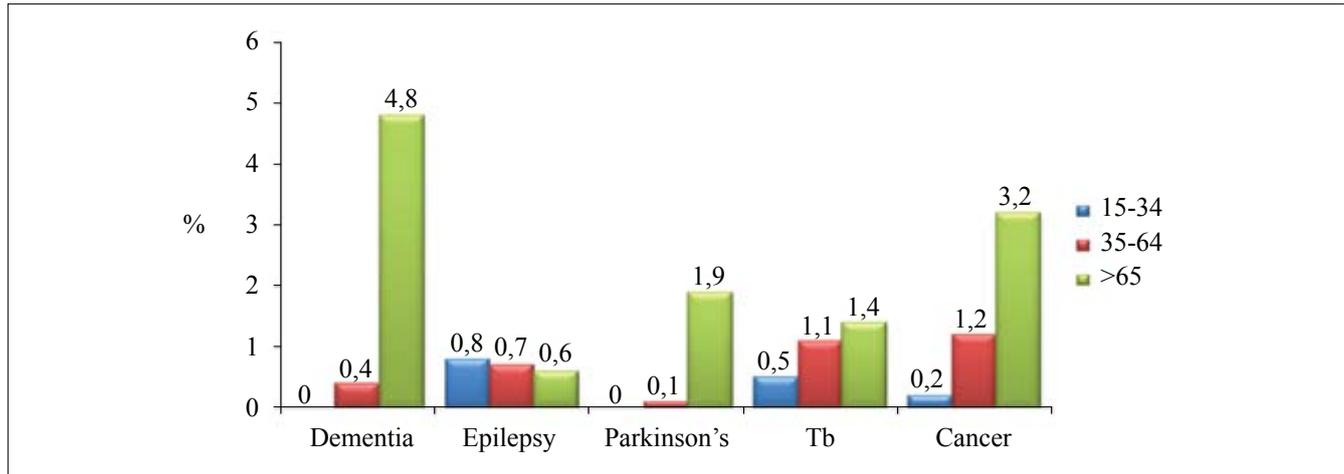


Figure 15.4 Prevalence of some NCDs by age groups, Turkey 2011.

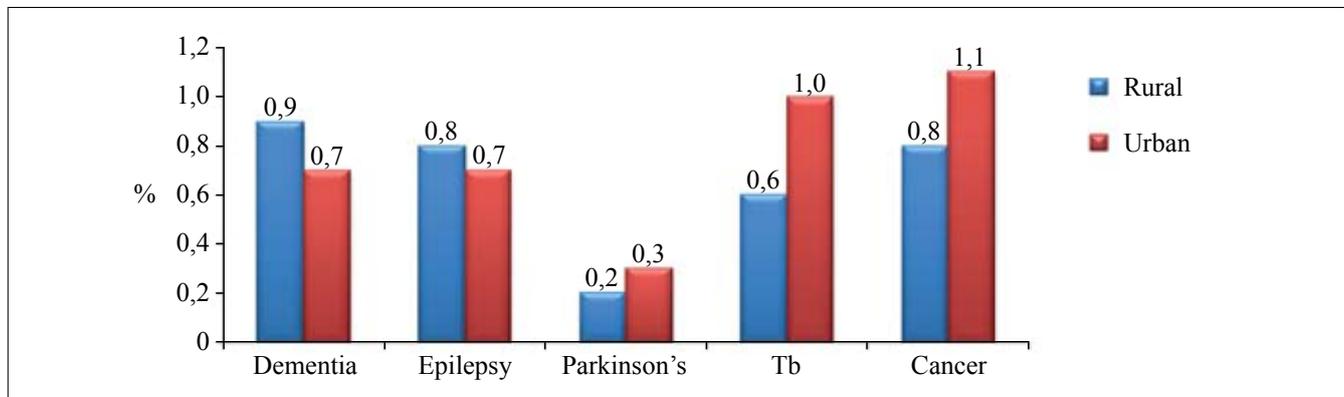


Figure 15.5 Prevalence of some NCDs by area of residence, Turkey 2011.

Prevalence for all accidents is 3%; 1.2% of the accidents are home accidents, 1.6 are traffic accidents and 0.5% are occupational accidents. The most prevalent accident type, namely traffic accidents are seen most in 15-34 age group and males. Home accidents on the other hand, are seen most in 65-and-above age group and in females. Occupational accidents are seen most in 15-34 age group and in females (Table 15.3).

Table 15.3 Prevalence of accidents by age, sex and area of residence, Turkey 2011.

	Number	Accident	Home Accident	Traffic Accident	Occupational Accident
Age group					
15-34	7462	3,7	0,8	2,2	(0,6)
35-64	8999	2,9	1,2	1,1	(0,4)
> 65	2015	3,5	(2,4)	(0,9)	(0,2)
Sex					
Male	8761	4,2	0,9	2,4	0,9
Female	9715	2,5	1,5	0,8	(0,1)
Area of residence					
Rural	5335	3,1	1,3	1,2	(0,5)
Urban	12825	3,4	1,2	1,7	0,5
Total	18477	3,3	1,2	1,6	0,5
% 95 CI		(3,04-3,57)	(1,04-1,35)	(1,37-1,73)	(0,37-0,57)



15.4 Discussion

If one considers that it would be more difficult for patients with dementia to visit the FHCs, it can be thought that the prevalence found would be lower than the real prevalence in the community. Although dementia prevalence was found three times higher in females than males in a field study conducted in Eskişehir, in the current study there were no differences found between sexes. This might be caused by the lower participation of females with dementia in the study.

Cancer prevalence being 1% indicates that at least 550,000 people live with the diagnosis of cancer in Turkey. When the number of cancer patients who have not been in a condition to participate in this study, who have been receiving treatment at hospital and the cancer patients who are under 15 years of age, this figure would increase. While cancer incidence is higher in males (210 per one hundred thousand) than females (129 per one hundred thousand), for prevalence the situation is reversed. This can be explained by the most prevalent cancer in males being lung cancer, allowing for a shorter survival; and the most prevalent cancer in females being breast cancer, allowing for a longer survival.

It is thought that accident prevalence might have been found lower than the actual figures, when the findings of this study are compared to the results of studies conducted particularly on this topic. In this study, it is thought that, only the accidents which caused severe injuries were reported as home accidents. As one considers that the participation of the employed individuals might have been lower, one should think that occupational accidents would have been reported lower. Similarly, as traffic accidents would have been encountered in younger and employed population, the results might be lower than they really are.

Recently, some action plans about primary issues such as cardiovascular diseases, diabetes, chronic respiratory diseases have been prepared with the participation of Ministry of Health and other respective persons and institutions, and some advances have been achieved. When the demographic structure of our society is considered, policies about the diseases mentioned in this chapter should be determined and carried out, since these diseases would increase in the following years.



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16

Mental Health Problems Brief PHQ-r (KiSA) Survey





16 Mental Health Problems – Brief PHQ-r (KıSA) Survey

Professor Sibel KALAÇA

Key Findings

- In this study, prevalence of depressive disorders (major+minor), somatisation disorders and panic disorder in the population above 15 years of age has been determined using the KıSA (Brief PHQ-r) survey.
- 15% of the participants declared that they had been diagnosed by a physician with migraine, and another 9% with depression. For both conditions, prevalence is higher in females than males.
- Reported migraine and depression in females is more frequent in those who live in urban areas; however there is no difference between rural and urban areas in males.
- Prevalence of depressive disorder (major+minor) is 9%, somatiation prevalence is 5% and panic disorder prevalence is 2%.
- All three mental health problems are more frequent in females. Depression and panic disorder prevalence is two times and somatization prevalence is three times more frequent in females than males.
- Mental health problems are seen with the highest rates in males and females over 75 age group.
- Total mental health disorders prevalence in urban (12%) is similar to the rural areas (11%).
- Total mental health disorder prevalence varies between 8% (Western Marmara) and 17% (Eastern Central Anatolia) between the NUTS1 regions. The region with the second highest rate for mental health disorders is South-eastern Anatolia region (14%).
- The most significant result of the study is the necessity of considering females and elders a risk group in terms of mental health disorders, as it is in the world; and as it has been shown by other studies conducted nationally and/or locally.



16.1 Introduction

While developing countries focus on physical health, the emphasis on mental health increases as the level of development increases. Developed countries have been making special policies for mental health (1). One of the basic requirements for devising efficient, practicable and acceptable health policies is to determine correctly the current status of the health problem or issue, the burden it causes and its distribution. When the situation about the epidemiology of mental health in our country, it is seen that studies that depended on solely the institutional records had been conducted until 1960s; and field studies had started after this period. After 1975, however, studies on psychiatric disorders had been conducted using reliable and standard diagnosis scales and criteria (2). Wide-scale studies on province, region or nation levels had started in the post-90s era (2, 3). There are two studies, conducted with the support of Ministry of Health, which provide crucial information on the subject in order to make plans about mental health in our country: Turkey Mental Health Profiling Study is a multi-centred study that had been conducted in 1996, by which the national level data about the prevalence of mental illnesses, their risk factors, disability, and the use of mental services had been obtained for the first time (1,2). According to the results of the study, prevalence of any mental disorder had been determined as 17.2%, prevalence of all disorders, except for alcohol addiction, had been found higher in females than in males (2). These findings show that mental illnesses are frequent in our country as they are in western countries. The National Burden of Diseases Study, conducted by the Public Health School, also asserted similar findings. When the reasons for national disease burden are distributed to basic disease groups, it is seen that psychiatric illnesses comes second with a 19% rate after cardiovascular diseases (4). Among basic disease groups that cause YLD (Years lost with disability), psychiatric illnesses are the most frequent reason for YLD, which is one the subcategories of DALY (Disability Adjusted Life Years), the other one YLL (Years of Life Lost) (1). It is seen that five psychiatric illnesses in males and four of them (unipolar depression in the first place) are among the 20 reasons for YLD (4). The researchers who had conducted the study interpreted mental illnesses as creating a heavy disease burden in Turkey in both rural and urban areas (1).

This chapter presents the evaluations on the current situation about the mental health problems, and the prevalence of depressive disorders, somatization disorders, panic disorders and total mental health disorders in the population above 15 years of age. Prevalence of migraine/frequent headache, depression history and other prevalences were presented by sex, age groups, area of residence and NUTS1 regions.

16.2 Methods and Definitions

Depression, Migraine/Frequent Headache History

Depression, migraine/frequent headache history was evaluated by asking the question “Do you have any of the chronic diseases or conditions below, diagnosed by a physician?” Individuals who declared depression or migraine based on physician diagnosis were also asked whether they used medication regularly, and if they had a medical report.



KıSA Survey (Brief Patient Health Questionnaire -Revised)

The diagnosis of mental illnesses in this study was conducted using the KıSA (Brief PHQ-r) survey. This survey was adapted from the Primary Care Evaluations of Mental Disorders (Prime-MD) scale by Spritzer et al. in 1999, which is one of the various scales devised to be used in the primary healthcare(5). The most significant feature of the scale is that it can be completed by the individual/patient himself. Clinician or the individual who does the evaluation marks the answers given according to the instructions in the last page of the survey and determines the diagnosis. The validation for the Turkish version of this test, which was devised to get a diagnosis for depression, panic disorders and somatoform disorder in primary healthcare, had been conducted by Çorapçioğlu et al. between 2000 and 2001 (6). The use of the scale in primary clinical practice and field studies on psychiatric disorders was advised since the diagnosis validity of the scale was evaluated quite high (6).

Diagnosis Groups According to KıSA Survey

The first section of the scale comprises of 13 questions asked to evaluate the somatoform disorders. In this section, individuals are asked how much trouble they have experienced about the health problems listed in the last month. While getting diagnosis of somatoform disorder, the diseases reported by the individuals were not taken into consideration. In the second section, there are nine questions asked to evaluate depressive disorders and the troubles experienced in the last two weeks are evaluated. Third section comprises of five questions asked to evaluate panic disorders.

The rate of the individuals who has one of these three mental disorders is defined as the total mental disorder rate.

Since the study was conducted not on individuals who consulted to a health institution with a complaint but on healthy population, it is necessary to evaluate the clinical significance of the current symptoms while getting diagnosis of mental disorders. Therefore, participants were asked the question “How much has any problem in the questions you answered up to now influenced your relations with others, or your fulfilling the responsibilities at home and at the workplace?” at the end of the survey. Participants who answered this question as “has not influenced” were diagnosed as “no illnesses” while determining the mental disorders according to KıSA survey.

16.3 Findings

Declared Depression and Migraine/Frequent Headache Prevalence

In total, 15% of the participants declared that they had been diagnosed by a physician with migraine, and 9% declared that they had been diagnosed with depression. For both conditions prevalence in females is 2.5 to 4 times higher than males. Migraine diagnosis is 21% in females, and 8% in males; depression based on statement is 13% in females, and 5% in males (Table 16.1, 16.2) (Figure 16.1). 28% of the participants who stated migraine diagnosis use medication due to this illness.



Table 16.1 Declared depression and migraine/frequent headache in males by age, area of residence and NUTS1 regions, Turkey 2011.

	Depression		Migraine/frequent headache	
Age groups	n	%	n	%
15-24	56	3,3	104	6,2
25-34	92	5,0	199	10,9
35-44	84	5,0	177	10,5
45-54	76	5,3	133	9,3
55-64	80	7,5	57	5,4
65-74	26	4,5	28	4,8
75 +	19	5,7	16	4,8
NUTS1 regions				
İstanbul	88	5,6	147	9,3
Western Marmara	20	4,9	23	5,6
Aegean	45	3,9	80	7,0
Eastern Marmara	33	3,9	65	7,7
Western Anatolia	32	4,1	67	8,6
Mediterranean	61	5,5	79	7,1
Central Anatolia	21	4,7	35	8,0
Western Black Sea	38	6,9	49	8,9
Eastern Black Sea	22	7,1	20	6,4
North Eastern Anatolia	8	3,2	26	10,5
Middle Eastern Anatolia	22	5,1	39	9,1
South Eastern Anatolia	42	5,6	83	11,1
Area of Residence				
Rural	130	5,1	209	8,2
Urban	298	5,0	496	8,4
Total	432	5,0	714	8,3
%95 CI		(4,5 - 5,5)		(7,7 - 8,9)



Table 16.2 Declared depression and migraine/frequent headache in females by age, area of residence and NUTS1 regions, Turkey 2011.

	Depression		Migraine/frequent headache	
	n	%	n	%
Age groups				
15-24	93	5,1	263	14,3
25-34	256	12,8	494	24,8
35-44	289	15,7	516	27,9
45-54	327	19,5	417	24,8
55-64	176	15,7	173	15,4
65-74	65	10,3	73	11,6
75 +	42	9,9	46	10,8
NUTS1 regions				
İstanbul	294	16,5	399	22,5
Western Marmara	57	12,9	74	16,8
Aegean	178	12,8	257	18,6
Eastern Marmara	126	13,8	181	19,8
Western Anatolia	131	13,5	212	21,7
Mediterranean	138	11,6	202	16,9
Central Anatolia	60	11,9	115	22,7
Western Black Sea	88	14,2	150	24,1
Eastern Black Sea	56	16,8	75	22,5
North Eastern Anatolia	25	10,1	63	25,6
Middle Eastern Anatolia	29	7,9	84	22,9
South Eastern Anatolia	67	8,5	169	21,4
Area of Residence				
Rural	264	9,8	518	19,3
Urban	967	14,5	1438	21,5
Total	1249	13,1	1981	20,7
%95 CI		(12,4 - 13,8)		(19,9 - 21,5)

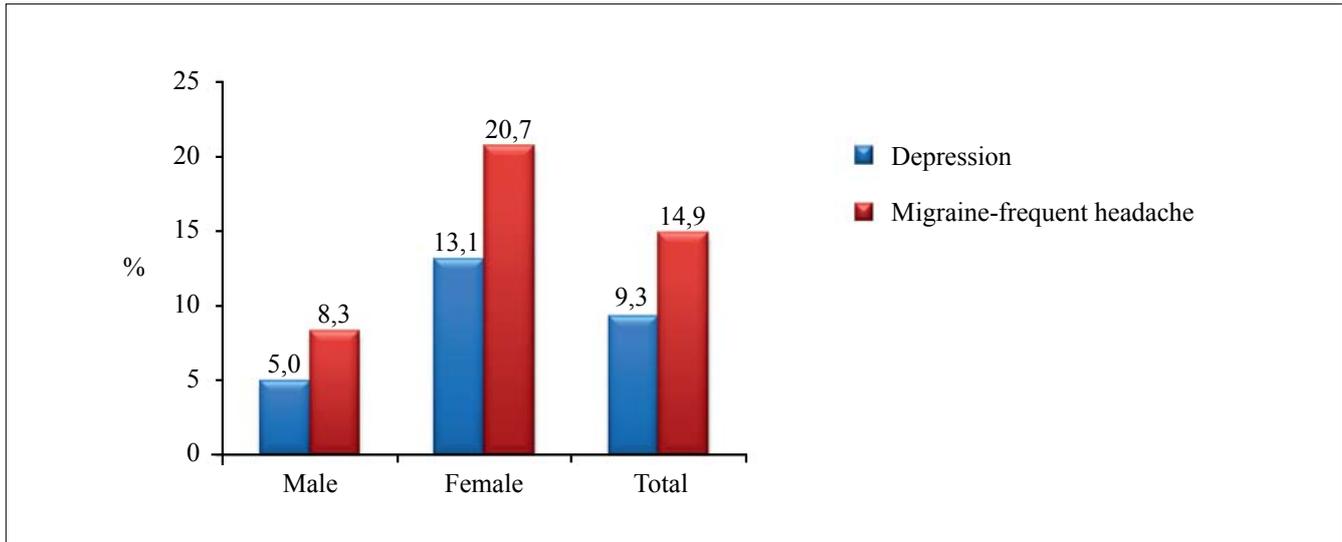


Figure 16.1 Declared depression and Migraine/frequent headache by sex, Turkey 2011.

Migraine prevalence is 18% in 25-34 age group, 20% in 35-44 age group and 18% in 45-54 age group. The highest prevalence is in 25-54 age groups. The prevalence of depression is 9% in 25-34 age group, 11% in 35-44 age group and 13% in 45-54 age group. For both conditions the prevalence is 8% in the 75-and-above age group (Figure 16.2). When the findings are evaluated separately for females and males, depression and migraine prevalence is the highest in 25-54 age groups (Table 16.1, 16.2).

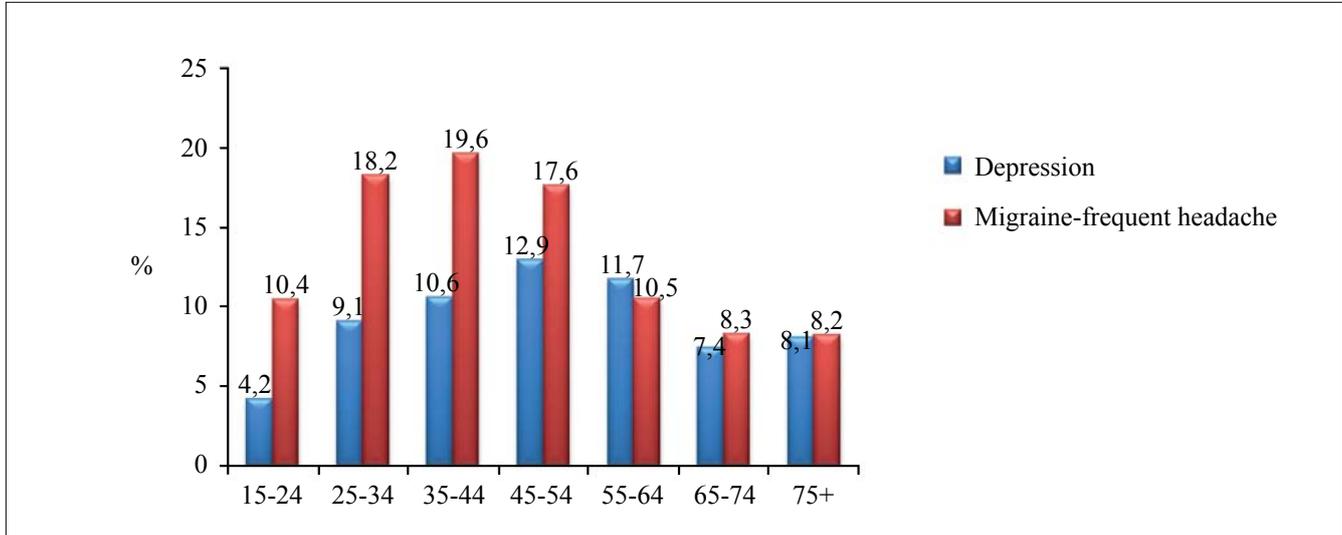


Figure 16.2 Declared depression and Migraine/frequent headache by age groups, Turkey 2011.

The declared migraine and depression prevalence in females is higher in urban areas than in rural areas. While the declared depression prevalence in urban areas is 14% and migraine prevalence is 21%, these values are 10% and 19% respectively in rural areas. There is no difference between rural and urban areas in males (Table 16.1, 16.2).

Declared depression prevalence in males varies between 3% (North-eastern Anatolia) and 7% (Eastern Black Sea). As for migraine, it varies between 6% in Western Marmara and 10% in North-eastern Anatolia regions. In women depression prevalence varies between 8% (Eastern Central Anatolia) and



17% (Eastern Black Sea). The region with the lowest declared migraine prevalence is Western Marmara (17%), and the highest one is North-eastern Anatolia (26%) (Table 16.1, 16.2).

Mental Health Disorders Prevalence

The total mental health disorder prevalence, which includes depressive disorder, somatization and panic disorder diagnosis made by the KISA survey is 12%, and it is two times higher in females (16%) than males (7%). Table 16.3 presents the prevalence for the one, two and three mental disorder diagnosis areas in the population above 15 years of age. Accordingly, 8% of the participants have one, 3% have two and 0.4% have three mental disorder diagnoses.

Table 16.3 Mental disorder prevalence in research population – with regard to KISA survey, Turkey 2011.

Mental disorder	Number	%	(%95 CI)
No diagnosis	15315	88,3	(88,0-89,0)
One diagnosis	1369	7,9	(7,5-8,3)
Two diagnoses	591	3,4	(3,1-3,7)
Three diagnoses	68	0,4	(0,3-0,5)
Depressive Disorders (major+minor)	1614	9,3	(8,9-9,7)
Major depressive disorder	816	4,7	(4,3-5,0)
Minor depressive disorder	798	4,6	(4,3-4,9)
Somatoform disorder	862	5,0	(4,6-5,3)
Panic disorder	281	1,6	(1,4-1,7)

According to the results of the study, depressive disorder (major+minor) prevalence in the society is 9%, somatization disorder prevalence is 5% and panic disorder prevalence is 2%. Depressive disorder prevalence is 6% in males and 12% in females; somatization disorder prevalence is 2% in males and 7% in females; and panic disorder prevalence is 1% in males and 2% in females. All three mental disorders are seen more frequently in females; while the prevalence of depression and panic disorder in females is two times higher than males, it is three times higher for somatization disorder (Table 16.4, 16.5) (Figure 16.3).



Table 16.4 Mental health disorders according to KiSA survey in males by age, area of residence and NUTS1 regions, Turkey 2011.

Basic Features	Major Depressive Disorder		Minor Depressive Disorder		Somatization Disorder		Panic Disorder		Total Mental Health disorder	
	n	%	n	%	n	%	n	%	n	%
Age groups										
15-24	33	2,1	62	3,9	11	0,7	12	0,8	103	6,4
25-34	45	2,6	55	3,2	42	2,4	14	0,8	126	7,3
35-44	46	2,9	52	3,2	34	2,1	12	0,7	120	7,5
45-54	32	2,3	41	3,0	31	2,3	13	1,0	88	6,4
55-64	26	2,6	26	2,6	24	2,4	8	0,8	68	6,7
65-74	19	3,4	23	4,1	17	3,1	3	0,5	49	8,8
75 +	14	4,5	11	3,5	14	4,5	4	1,3	30	9,6
NUTS1 Regions										
İstanbul	43	2,9	50	3,3	30	2,0	13	0,9	110	7,3
Western Marmara	3	0,8	8	2,0	3	0,8	2	0,5	12	3,0
Aegean	32	3,0	20	1,8	24	2,2	8	0,7	63	5,8
Eastern Marmara	13	1,6	22	2,7	15	1,9	3	0,4	41	5,1
Western Anatolia	23	3,1	22	3,0	16	2,2	6	0,8	55	7,4
Mediterranean	21	2,0	34	3,2	20	1,9	10	0,9	70	6,5
Central Anatolia	12	2,9	18	4,3	10	2,4	3	0,7	37	8,8
Western Black Sea	17	3,2	13	2,4	10	1,9	4	0,7	37	6,9
Eastern Black Sea	9	3,0	9	3,0	4	1,3	1	0,3	20	6,7
North Eastern Anatolia	5	2,1	6	2,5	8	3,4	2	0,8	13	5,5
Eastern Central Anatolia	8	2,0	36	9,1	10	2,5	6	1,5	54	13,6
South Eastern Anatolia	30	4,3	31	4,4	25	3,6	9	1,3	72	10,3
Area of Residence										
Rural	49	2,0	71	2,9	54	2,2	13	0,5	159	6,5
Urban	163	2,9	195	3,5	115	2,0	52	0,9	415	7,4
Total	215	2,6	269	3,3	174	2,1	66	0,8	584	7,1
%95 CI		(2,3-2,9)		(2,9-3,7)		(1,8-2,4)		(0,6-0,9)		(6,5-7,6)



Table 16.5 Mental health disorders according to KıSA survey in females by age, area of residence and NUTS1 regions, Turkey 2011.

	Major Depressive Disorder		Minor Depressive Disorder		Somatization Disorder		Panic Disorder		Total Mental Health disorder	
	n	%	n	%	n	%	n	%	n	%
Age groups										
15-24	77	4,4	76	4,3	59	3,3	26	1,5	188	10,6
25-34	130	6,8	102	5,4	123	6,5	40	2,1	288	15,1
35-44	108	6,1	123	7,0	139	7,9	42	2,4	297	16,8
45-54	119	7,4	110	6,8	133	8,2	43	2,7	283	17,5
55-64	81	7,4	65	5,9	111	10,1	37	3,4	198	18,1
65-74	39	6,5	28	4,6	56	9,3	16	2,6	95	15,7
75 +	47	11,4	25	6,1	67	16,3	12	2,9	97	23,6
NUTS1 Regions										
İstanbul	144	8,4	94	5,5	130	7,6	52	3,0	298	17,4
Western Marmara	21	4,9	21	4,9	26	6,1	11	2,6	54	12,6
Aegean	75	5,6	71	5,3	82	6,2	30	2,3	185	13,9
Eastern Marmara	33	3,8	54	6,2	58	6,6	16	1,8	118	13,5
Western Anatolia	63	6,7	48	5,1	81	8,	12	1,3	139	14,9
Mediterranean	67	5,8	71	6,2	76	6,6	25	2,2	174	15,2
Central Anatolia	41	8,6	23	4,9	33	7,0	15	3,2	78	16,5
Western Black Sea	29	4,8	44	7,3	54	8,9	15	2,5	100	16,5
Eastern Black Sea	27	8,4	10	3,1	17	5,3	9	2,8	45	14,1
North Eastern Anatolia	15	6,5	15	6,5	22	9,5	3	1,3	42	18,2
Eastern Central Anatolia	27	7,6	28	7,9	44	12,5	9	2,5	74	20,9
South Eastern Anatolia	58	7,7	50	6,7	64	8,5	18	2,4	138	18,4
Area of Residence										
Rural	158	6,1	145	5,6	180	7,0	57	2,2	386	15,0
Urban	424	6,6	377	5,9	488	7,6	156	2,4	1028	16,0
Total	601	6,6	529	5,8	688	7,5	215	2,4	1445	15,8
%95 CI		(5,5-6,5)		(5,3-6,3)		(6,9-8,0)		(2,1-2,7)		(15,0-16,5)

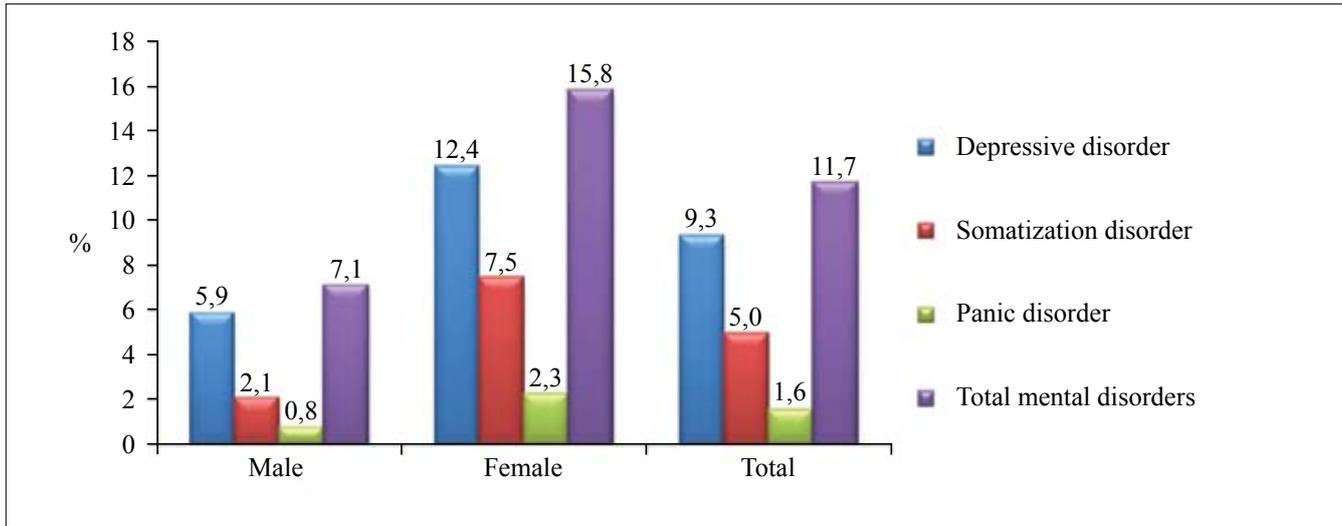


Figure 16.3 Mental health disorders according to KiSA Survey by sex, Turkey 2011.

Total mental health disorder prevalence in participants living in urban areas (12%) is similar to the ones living in rural areas (11%). While there is not a large difference between urban and rural areas with regard to depression, somatization and panic disorders, the rates in urban areas for each three disorders are slightly higher than the ones in rural areas. The most prevalent mental health problems in both areas of residence are depressive disorders, somatization disorders and panic disorders respectively (Figure 16.4).

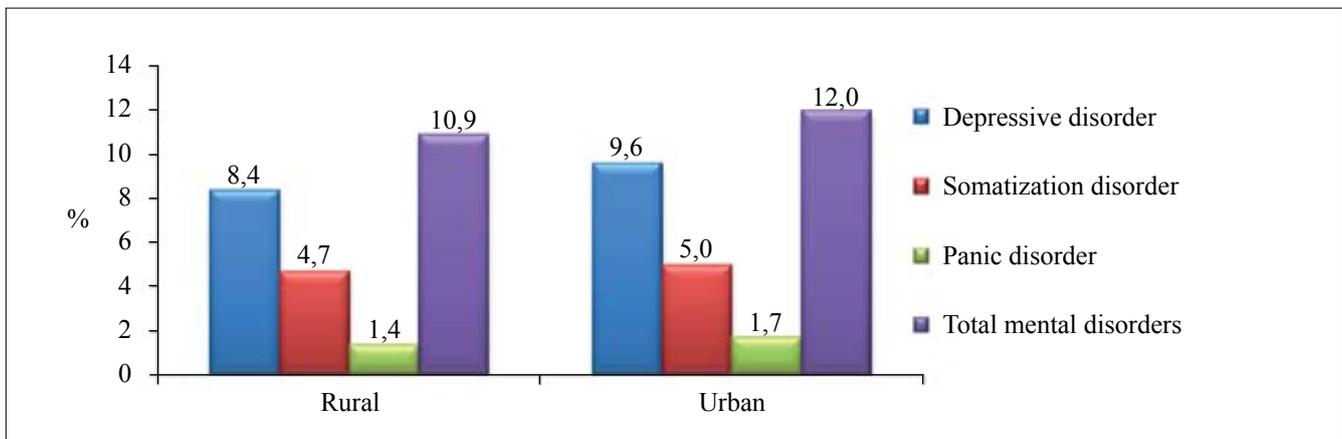


Figure 16.4 Mental health disorders according to KiSA Survey by area of residence, Turkey 2011.

Total mental health disorders prevalence varies between 9% (15-24 age group) and 18% (75-and-above) between age groups. Depressive disorder prevalence varies between 7% (15-24 age group) and 13% (75-and-above); somatization disorder prevalence varies between 2% (15-24 age group) and 11% (75-and-above); panic disorder prevalence between 1% (15-24 age group) and 2% (75-and-above). All three mental health problems increases with age; this trend is rather distinct in somatization disorders. Mental health disorders are seen at the highest rate in 75-and-above age group (Figure 16.5).

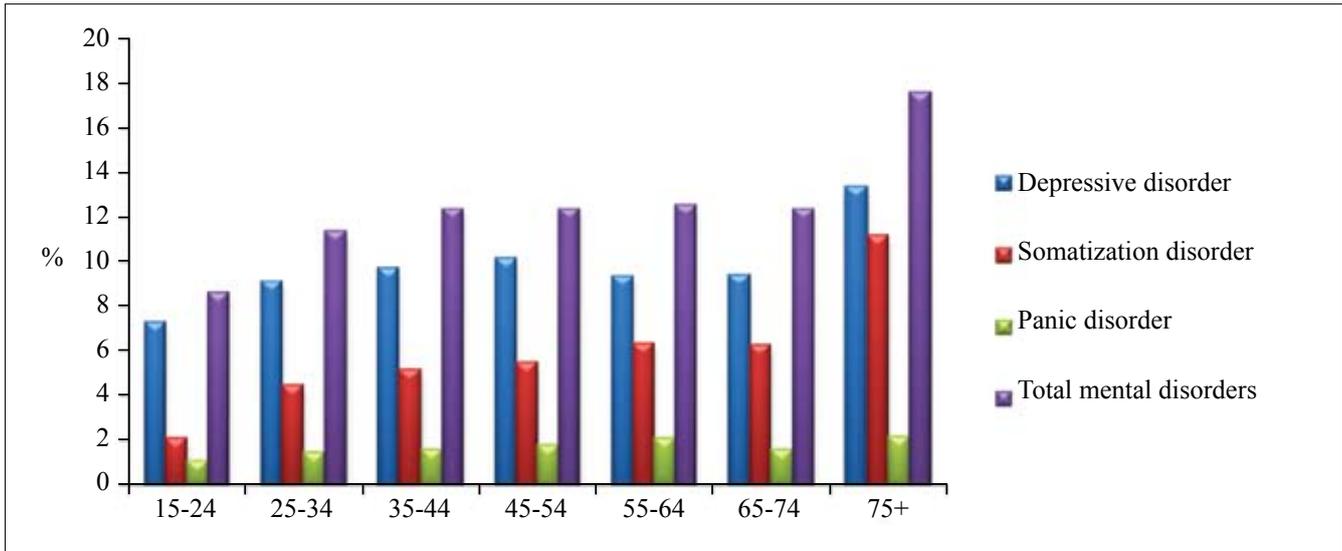


Figure 16.5 Mental health disorders according to KıSA Survey by age groups, Turkey 2011.

In Figure 16.6 and 16.7, the distribution of mental health disorders in males and females is presented. As it is in the population as a whole, both in males and females, 75-and-above age group is the group in which the mental health disorders are the most prevalent. When each age group category evaluated, it is seen that all three mental health disorders are distinctly more prevalent in females than males. For instance, while depressive disorder prevalence in males in 75-and-above group is 8%, this rate is 18% in females of the same group. Somatization disorder prevalence in the same age group is 4% for males and 16% in females. Panic disorder prevalence in 75-and-above group is 4% in males and 16% in females (Table 16.4, 16.5).

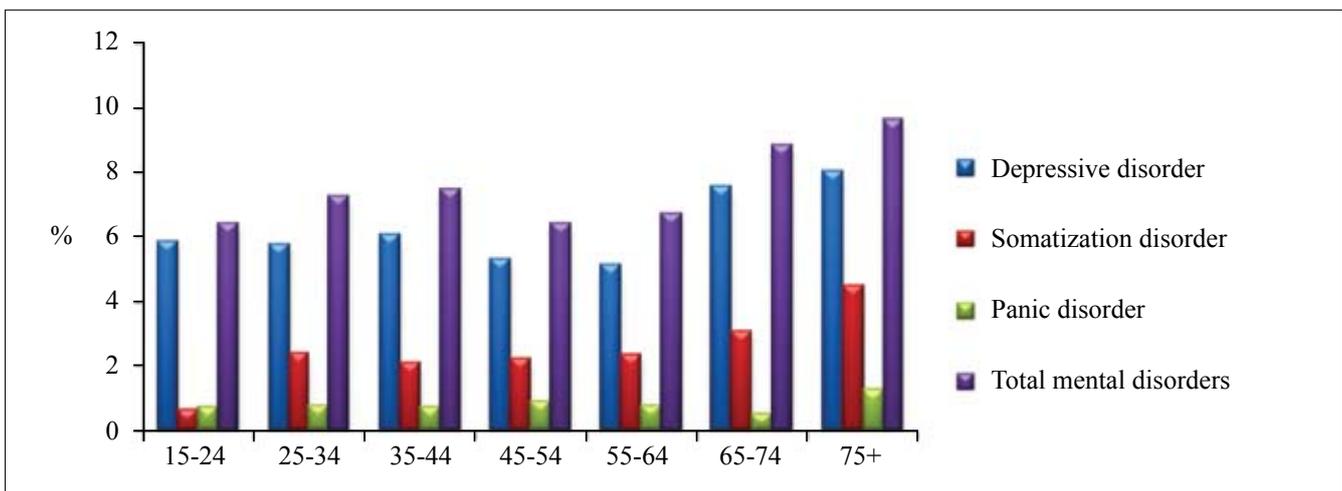


Figure 16.6 Mental health disorders according to KıSA Survey in males by age groups, Turkey 2011.

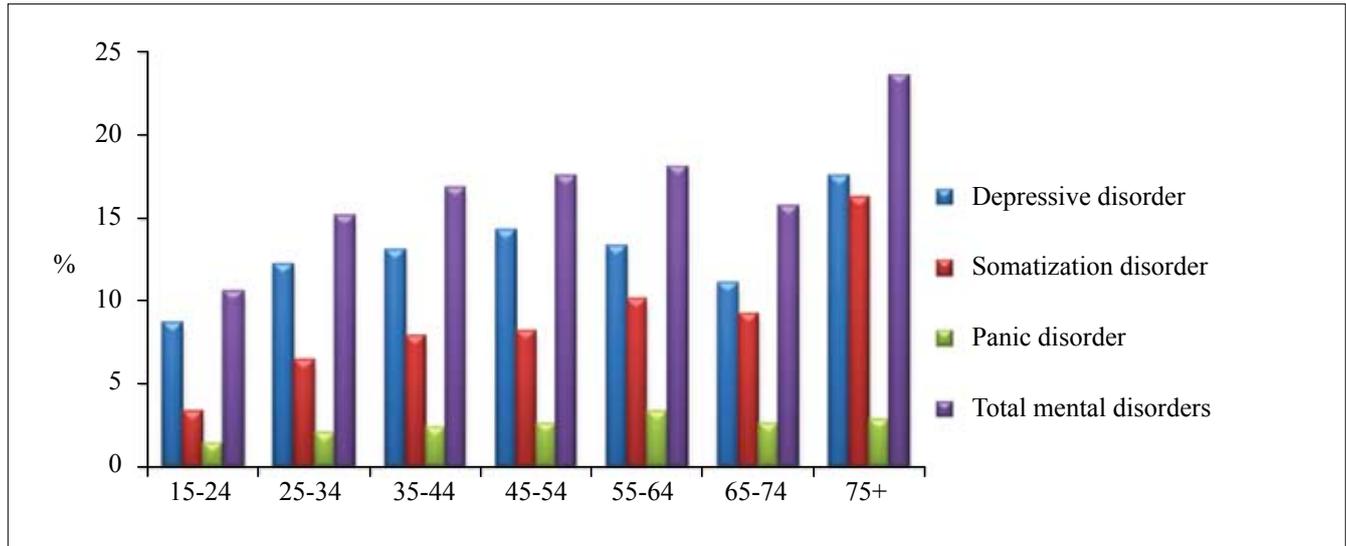


Figure 16.7 Mental health disorders according to KiSA Survey in females by age groups, Turkey 2011.

When evaluated according to the NUTS1 regions, total mental health disorders prevalence varies between 8% (Western Marmara) and 17% (Eastern Central Anatolia). The region with the second highest rate for mental health disorders is South-eastern Anatolia region (14%) (Figure 16.8). Mental health disorders according to NUTS1 regions are presented for males and females separately in Table 16.4 and 16.5. In Table 16.6, standardized rates for mental health disorders are presented.

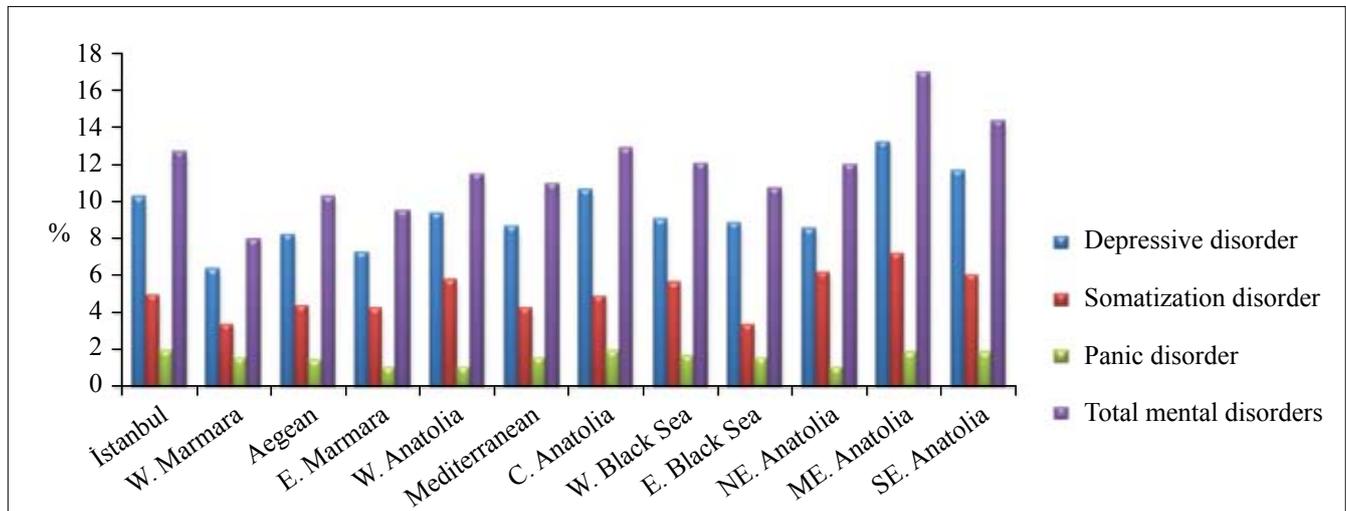


Figure 16.8 Mental health disorders according to KiSA Survey in females by age groups, Turkey 2011

Table 16.6 Mental health disorders by sex, standardized rates, Turkey 2011.

Sex	Major Depressive Disorder %*	Minor Depressive Disorder %*	Somatization Disorder %*	Panic Disorder %*	Total Mental Health Disorders %*
Male	2,6	3,3	2,0	0,8	7,1
Female	6,5	5,7	7,3	2,3	15,5
Total	4,5	4,5	4,7	1,6	11,3

* Standardized using Turkey 2010 population



16.4 Discussion

In this study, prevalence of depressive disorders (major+minor), somatization disorders and panic disorder in the population above 15 years of age has been determined using the K1SA (Brief PHQ-r) survey. Wide-scale studies on province, region or nation levels in our country had started in the post-90s era (2, 3). Turkey Mental Health Profiling Study (1998) is a multi-centred study which used the Composite International Diagnostic Interview (CIDI) in the diagnosis of mental disorders (7). According to the results of the study, prevalence of any mental disorder had been determined as 17.2%, prevalence of all disorders, except for alcohol addiction, had been found higher in females than in males (2).

According to the results of this study depressive disorder (major+minor) prevalence in the population above 15 years of age is 9%, somatization disorders prevalence is 5% and panic disorder prevalence is 2%. The prevalence of mental health disorders increase with age. Each three mental health disorders are seen most prevalently in the 75-and-above age group. One of the most significant findings of the study is that mental health disorder prevalence is higher in females, in all three disorder types, in line with both international and national literature.

Different diagnosis-detection tools are used in evaluating the prevalence of mental health disorders and research environments may vary. Primary health care is one the most important environments in evaluating the prevalence of mental health disorders (2). In a study on people between 18 and 65 ages who consulted to a primary healthcare facility, conducted in 2000, via an interview with a psychiatrist, major depressive disorder prevalence was found 13%, minor depressive disorder prevalence 7%, somatoform disorder prevalence 10% and panic disorder prevalence was found 3% (6). In other prevalence studies conducted on similar populations in Turkey, depressive disorder prevalence (major+minor) varies between 23% and 34% (8-11). In a research conducted in the household in Sivas using the Diagnostic Interview Scale (DIS-III-R), the major depression prevalence was found 19% (3). Depression disorder prevalence was found lower in our study compared to the previous studies. The reason for this, in addition to the difference in the diagnosis tool used, may be that the research group in other studies comprised of individuals who consulted to a primary health care facility due to a health issue. The participants in this study were chosen randomly from among the registered population of the family physicians.

Somatoform disorders prevalence, according to the previous studies conducted on individuals who consulted to the primary health care, varies between 5% and 12% (8-11); in the Sivas study, somatoform disorders prevalence was found 3% (3). Although, the prevalence found this study is similar to the previous studies (5%), it should be evaluated carefully. As it is suggested in the original version of the survey (6), whether the somatic complaints declared by the participants originated from organic reasons was not taken into consideration. As for panic disorder, it varies between 0.5% (8) and 12% (10). The prevalence found in this study is compatible with the prevalence mentioned in the literature (2%). Another important point to pay attention while comparing mental health disorder prevalence, except the diagnosis tools used and the research population is whether the prevalence found is a point prevalence, period prevalence or life prevalence. In this study which used K1SA survey, complaints about depressive disorders were evaluated for the last two weeks, and the complaints about somatoform disorders and panic disorders were evaluated for the last month.

The most significant result of the study is the requirement for the females and the individuals in the elderly group to be considered as an important risk group, as it has been shown in national and/or local studies conducted in Turkey, as well as in the world.

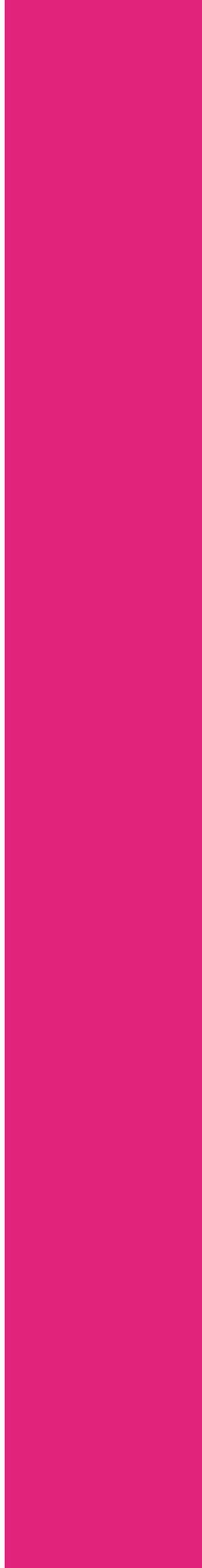


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17

Quality of Life





17 Quality of Life

Professor Gönül DİNÇ HORASAN

Key Findings

- EQ5D scale is a general quality of life scale which includes 5 questions about mobility, self-care, usual activities, pain/discomfort and anxiety/depression and a visual analogue scale (VAS) that evaluates the perceived health.
- In Turkish population, the proportion of people who have problems in mobility, pain/discomfort and anxiety/depression among the five dimensions of the quality of life is high. Each four women out of 10 and two men out of 10 have problems in pain/discomfort and anxiety/depression dimensions; three women out of 10, and one man out of 10 have some or severe problems in mobility.
- Quality of life in women is lower than men.
- For all dimensions, the proportion of individuals who stated that they had moderate severe problems increase with age. Among 65-and-above age group, two men out of three and nine women out of 10 stated that they experienced problems at least one of the five dimensions.
- In both sexes, the proportion of individuals who stated that they had no health problems (health state 11111) is lower in rural than urban, and it is lower in Central Anatolia, Western Black Sea, Eastern Black Sea and North-eastern Anatolia than other regions.
- Based on the responses to the five EQ-5D dimensions, the participants who had not problems in any of the five dimensions (health state 11111) were 64,1% in men and 40,7% in women.
- The mean \pm S_x of VAS score was 71,5 \pm 0,2 (%95 CI 70,9-72,1) in men, and it was 66,4 \pm 0,2 (%95 CI 65,8-66,9) in women.



17.1 Introduction

Perceived health and quality of life is among the indicators to determine the general health level of a population. EUROQoL-5D (EQ-5D) scale is a general health-related quality of life questionnaire developed by the EuroQol Group in order to provide a simple, generic measure of health for clinical and economic appraisal. The questionnaire is used to calculate QALY scores for economical appraisal (1). EQ-5D essentially consists of two parts: the EQ-5D descriptive system and the EQ VAS. The EQ-5D descriptive system comprises five different dimensions; mobility, self care, (ability to perform) usual activities, pain/discomfort and anxiety/depression. Informants are asked to rate their health state using the following scale for each dimension: 1) no problems, 2) some problems or 3) severe problems. This three way classification for each dimension gives rise to a possible 243 ‘health states’. These range from no problems across all dimensions (health state 11111) to severe problems across all dimensions (health state 33333). QALY scores are calculated based on population norms/tariffs using the answers to five dimensions. QALY scores are between “1” and “<1”. The score “1” indicated the perfect health status, and “<1”, smaller than one indicates that quality of life is not good. A QALY score smaller than “0.0” (negative) is interpreted as a health perception worse than death. In the second part of the EQ-5D scale a visual analogue scale (VAS) is used to evaluate the perceived health levels of the individuals. VAS is a vertical visual analogue scale with values between 0 and 100; “0” indicates ‘worst imaginable health state’, and “100” indicates ‘best imaginable health state’ (1).

17.2 Methods and Definitions

The participants were asked to evaluate their quality of life on the day of the interview. Individuals evaluated their quality of life for five dimensions including mobility, self care, ability to perform usual activities (i.e. working, studying, house work, and family or leisure time activities), pain/ discomfort and anxiety/depression- as “no problem – Level I”, “some problems – Level II” and “severe problems – Level III”. After giving information about the scale, individuals were asked to mark the health level they perceived on the day of interview onto the scale.

The proportion of participants reporting no problems, some problems, or severe problems for each health state, the proportion of participants reporting health state 11111, mean \pm S_x of VAS (95% CI) was calculated according to age, sex, residence and NUTS1 regions. Individuals who did not answer any of the items of EQ5D dimensions were left out while evaluating health state 11111. Since Turkish population EQ5D norms had not been developed yet, QALY scores were not calculated.

17.3 Findings

The proportion of men and women reporting no problems, some problems, or severe problems for each health dimensions is shown in Figure 17.1. Individuals who experienced some problems and severe problems are more frequent in pain/discomfort, anxiety/depression and mobility dimensions, compared to self-care and usual activities. Each four women out of 10 and two men out of 10 have problems in pain/ discomfort and anxiety/depression dimensions; three women out of 10, and one man out of 10 have some problems or severe problems in mobility. For all dimensions, individuals with some problems and severe



problems are approximately two times higher in women than in men. For all dimensions, the proportion of individuals who stated that they had some problems and severe problems increased with age. In the study, two men out of three among 65-and-above age group, and nine women out of 10 stated that they experienced problems at least one of the five dimensions. In young adult age group, problems about the first three dimensions are rare, while problems in pain/discomfort and anxiety/depression are common.

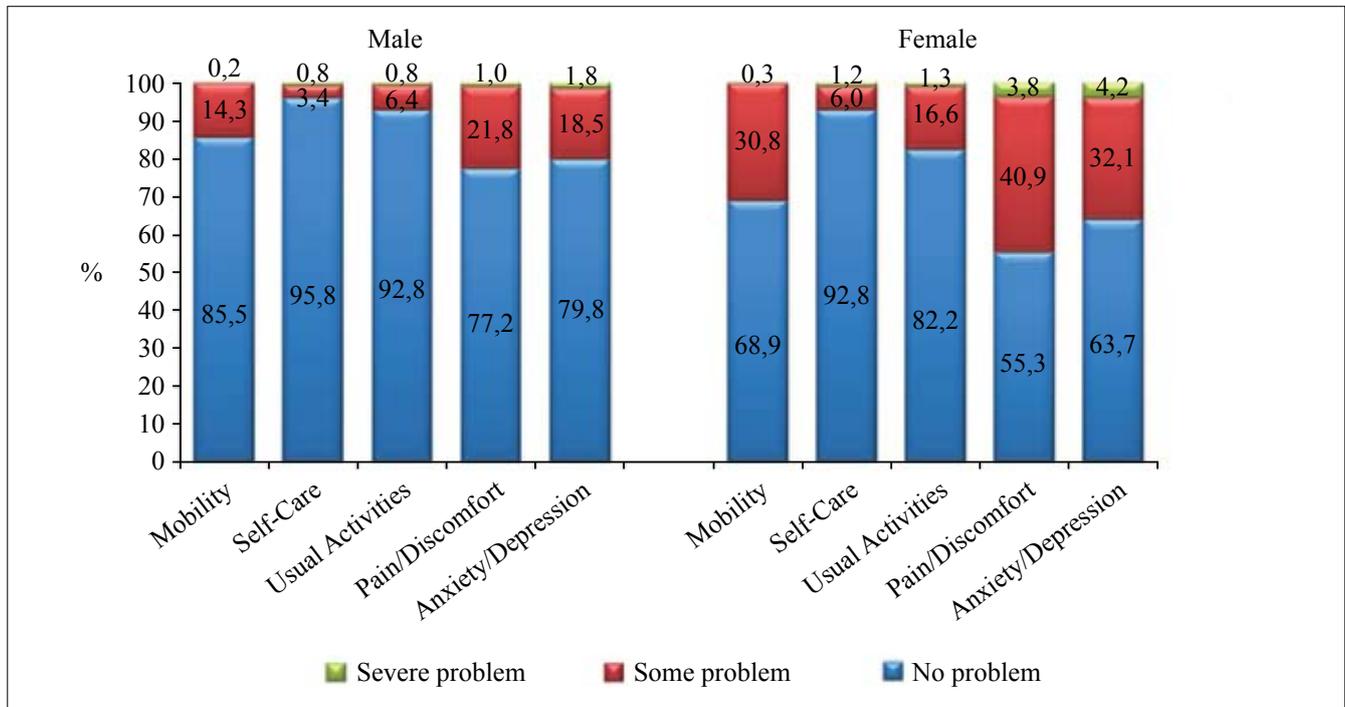


Figure 17.1 Proportion with some problems and severe problems for EQ5D dimensions according to sex, Turkey 2011.

The age and sex standardized percentage of having no health problems (health state 11111) is 52.4%. In other words, the proportion of the individuals who stated a problem at least in one of the five dimensions in the scale is 47.6%. 70.6% of the 15-24 age group reported having no health problems. The proportion of having no health problems decreases as the age increases. 64.1% of men and 40.7% of women reported having no health problems. In each age groups the proportion of men without health problems are higher than women (Table 17.1, Figure 17.2).



Table 17.1 Proportion of people without health problems by age and sex, Turkey 2011.

Health problem*	Age Groups							Total	Total**
	15-24	25-34	35-44	45-54	55-64	65-74	75+		
Men									
	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
No	76,3	69,3	63,9	60,4	53,9	41,2	26,0	62,6	64,1
Yes	23,7	30,7	36,1	39,6	46,1	58,8	74,0	37,4	35,9
Women									
No	65,3	51,0	39,9	27,8	19,3	11,6	6,1	39,1	40,7
Yes	34,7	49,0	60,1	72,2	80,7	88,4	93,9	60,9	59,3
Total									
No	70,6	59,8	51,3	42,8	36,1	25,9	14,8	50,3	52,4
Yes	29,4	40,2	48,7	57,2	63,9	74,1	85,2	49,7	47,6
Number of participant	3467	3716	3468	3077	2145	1199	759	17831	

* Individuals who stated that they did not have any problems in 5 dimensions of the EQ5D scale, whose answers were “11111”, were interpreted as “without health problems” and other answers were interpreted as “yes to some problems”.

** Standardized using Turkey 2010 population

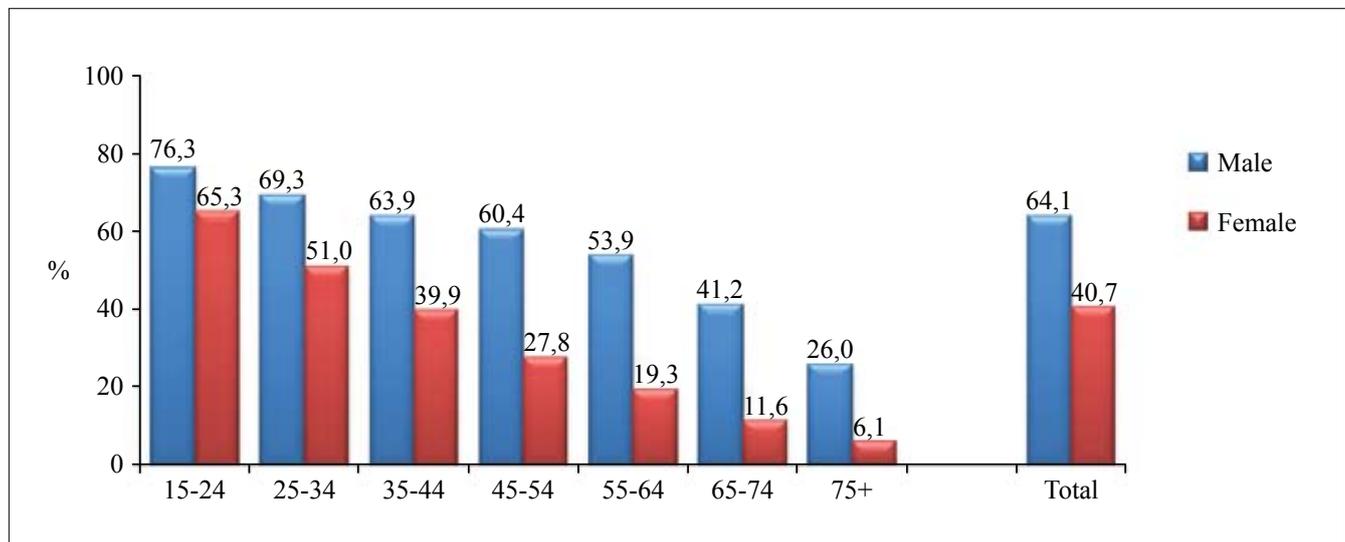


Figure 17.2 Proportion without health problems by age and sex, Turkey 2011.

For both men and women, participants reported having no health problems is lower in rural and in Central Anatolia, Western Black Sea, Eastern Black Sea and North-eastern Anatolia regions (Table 17.2).



Table 17.2 Proportion without health problems by sex, area of residence and NUTS 1 regions, Turkey 2011.

	Male (%)	Female (%)	Total (%)
Area of Residence			
Rural	60,1	35,4	47,4
Urban	63,7	40,7	51,5
NUTS 1 Regions			
İstanbul	62,4	38,7	49,8
Western Marmara	66,2	40,0	52,7
Aegean	65,7	40,3	51,8
Eastern Marmara	62,4	39,4	50,5
Western Anatolia	64,5	37,6	49,6
Mediterranean	66,0	44,3	54,8
Central Anatolia	61,8	34,0	47,1
Western Black Sea	58,4	34,3	45,7
Eastern Black Sea	59,5	33,1	45,9
North Eastern Anatolia	58,7	34,2	46,5
Middle Eastern Anatolia	61,8	36,3	50,0
South Eastern Anatolia	56,3	43,1	49,6
Total	62,6	39,1	50,3
Number of Participants	3660	5707	9367

* Individuals who stated that they did not have any problems in 5 dimensions of the EQ5D scale, whose answers were “11111”, were interpreted as “without health problems”.

The mean \pm S_x of VAS score for men was 71,5 \pm 0,2 (%95 CI 70,9-72,1), and for women it was 66,4 \pm 0,2 (%95 CI 65,8-66,9). In both sexes, mean VAS scores decrease with age (Table 17.3). The mean of VAS score is higher than that in women in all age groups. The mean VAS scores are similar in rural and urban. The means were found lower in Eastern Central Anatolia, South-eastern Anatolia and Eastern Black Sea regions, while higher in Marmara, Mediterranean and north-eastern Anatolia regions (Table 17.4)



Table 17.3 Mean scores of EQ5D visual analogue scale according to age and sex, Turkey 2011.

Age	Male		Female		Total		N
	Mean \pm S _x	%95CI	Mean \pm S _x	%95 CI	Mean \pm S _x	%95 CI	
15-24	77,1 \pm 0,6	75,8-78,4	75,5 \pm 0,6	74,2-76,7	76,3 \pm 0,4	75,4-77,2	3585
25-34	74,1 \pm 0,6	72,9-75,3	69,1 \pm 0,6	67,9-70,4	71,5 \pm 0,4	70,6-72,4	3877
35-44	71,6 \pm 0,6	70,3-72,9	66,6 \pm 0,6	65,4-67,9	69,0 \pm 0,4	68,1-69,9	3596
45-54	69,4 \pm 0,7	67,9-70,8	64,0 \pm 0,6	62,7-65,2	66,5 \pm 0,4	65,5-67,4	3180
55-64	68,9 \pm 0,8	67,3-70,5	61,2 \pm 0,7	59,7-62,7	65,0 \pm 0,5	63,8-66,1	2224
65-74	63,1 \pm 1,2	60,8-65,5	56,0 \pm 1,0	54,0-58,1	59,4 \pm 0,7	57,9-61,0	1234
75+	60,6 \pm 1,4	57,9-63,4	51,6 \pm 1,2	49,2-54,0	55,5 \pm 0,9	53,7-57,3	781
Total	71,5\pm0,2	70,9-72,1	66,4\pm0,2	65,8-66,9	68,8 \pm0,2	68,4-69,2	18477

Table 17.4 Mean scores of EQ5D visual analogue scale by NUTS1 regions and area of residence, Turkey 2011.

NUTS 1 Regions	Male		Female		Total		n
	Mean \pm S _x	%95CI	Mean \pm S _x	%95CI	Mean \pm S _x	%95CI	
İstanbul	70,8 \pm 0,7	69,4-72,2	66,4 \pm 0,6	65,1-67,7	68,5 \pm 0,4	67,5-69,4	3399
Western Marmara	73,7 \pm 1,2	71,3 -76,1	68,4 \pm 1,2	65,9-70,9	71,0 \pm 0,8	69,2-72,7	866
Aegean	72,4 \pm 0,8	70,8-74,0	65,9 \pm 0,7	64,4-67,4	68,8 \pm 0,5	67,7-69,9	2581
Eastern Marmara	73,6 \pm 0,9	71,8-75,4	67,2 \pm 0,9	65,4-69,0	70,3 \pm 0,6	69,0-71,5	1783
Western Anatolia	70,4 \pm 1,0	68,4-72,4	67,1 \pm 0,8	65,3-68,9	68,6 \pm 0,6	67,3-69,9	1799
Mediterranean	72,5 \pm 0,8	70,9-74,1	68,6 \pm 0,7	67,1-70,2	70,5 \pm 0,5	69,4-71,6	2337
Central Anatolia	73,1 \pm 1,2	70,6-75,7	65,0 \pm 1,2	62,5 -67,5	68,8 \pm 0,9	67,0-70,6	964
Weastern Black Sea	71,1 \pm 1,1	68,8-73,5	65,1 \pm 1,1	62,9-67,3	68,0 \pm 0,8	66,3-69,6	1189
Eastern Black Sea	69,9 \pm 1,5	66,9-73,0	64,0 \pm 1,6	60,8-67,2	66,9 \pm 1,1	64,6-69,1	660
North Eastern Anatolia	74,0 \pm 1,5	71,0-77,0	67,7 \pm 1,5	64,6-70,8	70,9 \pm 1,1	68,7-73,1	504
Middle Eastern Anatolia	69,4 \pm 1,3	66,8-72,0	62,7 \pm 1,3	60,0-65,5	66,3 \pm 0,9	64,4-68,2	816
South Eastern Anatolia	68,0 \pm 1,0	65,9-70,1	64,9 \pm 1,0	62,9-66,9	66,4 \pm 0,7	65,0-67,9	1579
Residence							
Rural	71,7 \pm 0,5	70,6-72,7	65,1 \pm 0,5	64,0-66,1	68,3 \pm 0,3	67,6-69,0	5335
Urban	71,5 \pm 0,3	70,8-72,3	66,9 \pm 0,3	66,3-67,6	69,1 \pm 0,2	68,6-69,6	12825
Total	71,5\pm0,2	70,9-72,1	66,4\pm0,2	65,8-66,9	68,8 \pm0,2	68,4-69,2	18477



17.4 Discussion

In Turkish population, the proportions of the participants reported problems in mobility, pain/discomfort and anxiety/depression are higher compared to the other dimensions. For all dimensions of quality of life scale, quality of life is worse in elders than younger people; and in women than men. Two men out of three in the 65-and-above age group, and nine women out of 10 stated that they experienced problems at least one of the five dimensions.

When Turkish EQ5D data are compared to the data of the EuroQol Group study based on the data 15 countries in the Europe, the quality of life is similar for all dimensions except for mobility. However, the perceived health level of Turkish population is quite low when compared to the data from these 15 countries (2). The quality of life of the Turkish people over 65 years of age is quite worse compared to the English elderly (based on the data of Health Survey in England in 2007). It is striking that Turkish women elders have rather worse quality of life than their English counterparts (3). In many studies which used different quality of life scales on different populations, it was found that quality of life is lower in elders than younger age groups, in women than men, in uneducated population than educated population, in unemployed than employed, and in the poor than the rich (4-6). A positive correlation with Gross National Product (GNP) and VAS score, a negative correlation with unemployment rate and VAS score were found in the 15 countries research of the European Quality of Life Group (2). Relatively lower socioeconomical level of Turkey may be responsible from the lower quality of life scores found in Turkish population compared to the European countries.

In this study, quality of life was found lower in rural areas and in Central Anatolia, Western Black Sea, Eastern Black Sea and North-eastern Anatolia regions. This may have resulted from higher elder population in rural dimensions and the NUTS1 regions mentioned above. The differences in the levels of welfare between rural and urban dimensions and regions may also be reason for the differences. These data should be evaluated with advanced statistical analyses.



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18

Preventive Services and Life Style Change Recommendations





18 Preventive Services and Life Style Change Recommendations

Professor Belgin ÜNAL

Key Findings

- The rate for being vaccinated against flu in the previous autumn-winter season is 9% in males and 6% in females.
- The rate of flu vaccination in 65-and-above age group is 16% in males and 13% females.
- The rate for pneumococcal vaccination is approximately 5% for both sexes in 65-and-above age group.
- The rate for having fecal occult blood analysis in 40-and-above age group is approximately 5% in both sexes.
- The rate for having cervical smear test in females above 40 years of age is 23% and the rate for mammography is 24%.
- Approximately 60% of the smokers have been advised quitting smoking by a physician.
- 27% of over-weight and obese males, and 40% of females were advised losing weight.
- Advice on healthy diet and physical activity are about 20%-30% in both sexes.
- Almost half of the participants with cardiovascular diseases have been given healthy diet recommendations such as reducing red meat, increasing fruit-vegetable consumption, consumption of oils instead of butter and losing weight and doing physical exercises.



18.1 Introduction

Interventions targeted to decrease the risk factors of the diseases in order to prevent diseases occurrence are called primary prevention. The most important preventive measure for communicable diseases is vaccination. The existence of non-communicable diseases and aging may worsen the clinical picture and may cause complication in infectious diseases such as flu and pneumonia.

Life style changes are included in the primary prevention in order to prevent developing non-communicable diseases. One of the fundamental strategies in primary prevention is population based interventions using legal regulations or multi-sector actions aimed at the whole society with disease or healthy, and the other one is the health-improvement or life-style change interventions aimed at individuals with high risks.

Interventions aimed at individuals with high risks are generally conducted by medical staff and in medical institutions. The individuals in the target population invited to a medical institution are screened when the individuals consult to a medical institution for another reason, and by this way it is determined whether these individuals have risks for diseases. When individuals are detected with a high risk of disease, by appropriate consulting, guidance and treatment if necessary, the risk of the individuals is aimed to be reduced.

Smoking, overweight or obesity, diabetes and hypertension are risk factors for non-communicable diseases and may be prevented by life style changes. Since primary health care institutions are easily accessed by the public, they have an important role in people's building and maintaining healthy behaviours. However, it is found, in studies conducted in various countries, that the rates for the physicians to give life style change recommendations are very low. For instance, in a study conducted in Australia, 15% of the overweight or obese individuals stated that they were given recommendations about losing weight (1). It draws attention, in the studies conducted, that the physicians believed the necessity for a life style change in their patients, but they were not confident about themselves in giving recommendations about life style changes. It was also found that the physicians attached more importance to medical treatment due to their training (2).

There is not enough data on how frequently Turkish society have early diagnosis tests for cancer and how frequently life style change recommendations are given. Therefore data on vaccines, cancer screening tests and life style recommendations were collected.

18.2 Methods and Definitions

The status of vaccination against flu in the previous autumn-winter season was evaluated with the question "Have you had flu vaccine this year?" The participants were also asked the question "Have you ever had pneumonia/pneumococcus vaccine?" and the status of vaccination against pneumococcus was determined. BCG scar existence was determined by the physician during physical examination.

The participants were asked, by the physicians, if they ever had tests or examinations for early diagnosis in cancer. Females were asked, separately, if they ever had cervical smear for cervix cancer, mammography for breast cancer, fecal occult blood test or colonoscopy for colon cancer, and the tests and examinations they had were marked. Males were asked if they ever had prostate examination (rectal touch) for prostate cancer, fecal occult blood test or colonoscopy for colon cancer, and the tests and examinations they had were marked.



Life style change recommendation data was determined by asking the participants the question “Has any physician suggested changes in your life style?” The participants were reminded the options “quit smoking, lose weight, reduce red meat consumption, increase fruit and vegetable consumption, reduce salt consumption, use oil (instead of butter or margarine), do physical activities (walking, gymnastics, running)” and requested to answer the question.

18.3 Findings

Existence of BCG scar in the participants is almost 80% in both sexes. The rate for being vaccinated against flu in the previous autumn-winter period is 9% in males and 6% in females. The rate of flu vaccination in 65-and-above age group increases to 16% in males and 13% females. The rate for pneumococcal vaccination is 5% for both sexes in 65-and-above age group (Table 18.1).

The status for cancer early diagnosis examinations and screening tests is given only for 40-and-above age group. The rates for fecal occult blood and colonoscopy are below 5% for both sexes. One out of four females above 40 years of age stated that they had cervical smear or mammography before (Table 18.2).

Table 18.1 Frequency of some vaccines by sex, Turkey 2011.

Vaccines	Male		Female	
	n	%*	n	%*
BCG scar	6685	80,1	7474	80,6
Flu vaccine	735	8,7	581	6,2
Pneumococcus vaccine	191	2,2	182	1,9
Flu vaccine**	141	15,8	135	13,0
Pneumococcus vaccine**	46	5,1	51	4,9

* Column percentage

** for 65 years and above

Table 18.2 Frequency of some cancer screening test by sex, Turkey 2011.

Screening Tests	Male		Female	
	n	%*	n	%*
Fecal Occult Blood**	224	5,3	235	4,9
Colonoscopy**	163	3,4	161	3,4
Prostate**	559	13,2	-	-
Cervical smear**	-	-	1109	23,2
Mammography**	-	-	1160	24,3

* Column percentage

** for 40-years and above



The status for life style change recommendation by a physician is presented separately for the whole population above 15 years of age and the population with cardiovascular disease.

Quitting smoking is suggested to 31% of males and 12% of females. When the current smokers are considered this rate increases to 60% in males and 61% in females (Table 18.3). When overweight and obese individuals are considered, losing weight is suggested to 27% of males and 40% of females. Suggestions about healthy diet and physical activity are about 20% - 30% in both sexes, in general (Table 18.3).

Table 18.3 The frequency of having life style change advice from a physician by sex, Turkey 2011.

Suggestions	Male		Female		Total	
	Number	%	Number	%	Number	%
Quitting smoking	2694	30,8	1119	11,5	3813	20,7
Quitting smoking *	1915	59,8	678	60,6	2593	60,0
Losing weight	1439	16,5	2562	26,4	4001	21,7
Losing weight*	1192	27,3	2195	40,6	3387	65,4
Reducing red meat consumption	1702	19,5	1950	20,1	3652	19,8
Increasing fruit-vegetable consumption	2155	24,7	2873	29,6	5028	27,3
Reducing salt consumption	2296	26,3	3095	31,9	5391	29,2
Using oil (instead of butter or margarine)	1636	18,7	2149	22,2	3785	20,5
Doing physical activity	2459	28,1	3403	35,1	5862	31,8

* for smokers

** for overweight and obese

It draws attention that the frequency of giving life style change recommendation is higher in the individuals with cardiovascular diseases when compared to the normal population. Suggestion for quitting smoking has been given to 46% of male CVD patients and 15% of female CVD patients. These rates increase to 70% and 62% respectively in CVD patients who are currently smoking. However, it is remarkable that the recommendations for normal population such as reducing red meat consumption, increasing fruit-vegetable consumption, use of oils, losing weight and doing physical activities are suggested less than half of the population with CVD (Table 18.4).



Table 18.4 The frequency of life style change recommendations by a physician to patients with CVD, Turkey 2011.

Suggestions	Male		Female		Total	
	Number	%	Number	%	Number	%
Quitting smoking	478	45,5	200	15,0	678	28,5
Quitting smoking *	235	70,1	106	62,4	341	67,5
Losing weight	360	34,2	551	41,4	911	38,2
Reducing red meat consumption	456	43,4	544	40,8	1000	42,0
Increasing fruit-vegetable consumption	462	44,0	626	47,0	1088	45,7
Reducing salt consumption	583	55,4	759	57,0	1342	56,3
Using oil (instead of butter or margarine)	430	40,9	532	39,9	962	40,4
Doing physical activity	492	46,8	647	48,6	1139	47,8

* for current smokers

18.4 Discussion

The BCG vaccination, which is in the routine childhood vaccination schema, was found in 80% of both sexes. However, it is found that the vaccination against flu and pneumococcus is very low.

In this study, it is seen that the rate for receiving advice from a physician for life style changes is very low for the whole population. Even for the patients with cardiovascular diseases, less than half of them have been given recommendations such as healthy diet and doing exercises. In a study conducted in general population in the USA, the rate for recommendations by physicians, such as quitting smoking (49%), doing exercises (47%) and feeding habit (45%), seem higher. The rate for giving recommendations to the overweight and obese individuals about losing weight varies between 40% and 45% (3).

In meta-analyses about the interventional studies conducted in various countries, it was found that the simple life style change recommendations given by a practitioner or family physician have quite small benefits. For instance, if the rate for quitting smoking is 2-3% without recommendation, a simple recommendation for quitting increases this rate by 1-3% (4). A similar situation was found in a meta-analysis on physical activity studies. Any recommendation for increasing physical activity given by a physician in the primary care does not yield a meaningful and sustainable increase in physical activity (5). However, the meta-analyses depend on completed and published studies, so they cannot be generalized to the primary healthcare applications of all countries and societies. The efficiency of the recommendations on life style change given by physicians should be evaluated and the methods for giving recommendations and monitoring the results should be improved.

In the study, the rate for having test for early cancer diagnosis is found very low. Since there is not any structured screening program in our country, less than 5% of the participants, for both sexes, had fecal



occult blood test or colonoscopy. However, even in the countries with screening programs, the rate for having fecal occult blood test or colonoscopy is not so high. In the studies conducted in the European countries, the rate for individuals in 50-and-above age group who had fecal occult blood test is almost 50%. In other words, it is seen that half of the target group participated in the screening programs for colon cancers (6).

The study found that almost one-fourth of females had cervical smear and mammography. The participation rates are higher in the countries with screening programs for these two cancers. In the UK, 91% of females between 40 and 74 years of age had cervix cancer screening and 93% of had mammogram (7).



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19

Management of Chronic Diseases at Primary Health Care





19 Management of Chronic Diseases at Primary Health Care

Professor Belgin ÜNAL

Key Findings

- According to the physicians the most difficult aspect of providing service in the management of chronic diseases at the primary health care level is that the patients do not comply with the medication (61%) and non-pharmacologic therapies (25%).
- Almost half of the physicians stated that they used national and international guidelines in the management of chronic diseases. Use of guidelines is the lowest in Eastern Anatolia region.
- Almost 60% of the physicians evaluate their own proficiency in management of chronic diseases as good or very good. Physicians in the North, South and Eastern Central Anatolia regions stated higher rates of poor and very poor proficiency levels.



19.1 Introduction

It is imperative that in management of chronic diseases, prevention and treatment should be carried out together. WHO, in the 2008-2013 Action Plan, stated among the strategies about controlling the chronic diseases that the health systems should be restructured in order to manage these diseases and the required health man power should be trained (1).

The Turkish health system has been developed, since the first years of the Republic, around the communicable diseases and mother-child healthcare which were the primary public health issues. The health man power, infrastructure and the surveillance system have been structured in terms of these issues. Chronic diseases, on the other hand, were left to the therapeutic approach of the physician, and any structure integrating preventive and therapeutic approaches could not be constituted. However, the prevalence and burden of chronic diseases increase due to the demographic change in the Turkish society, and a substantial disease burden caused by these diseases develops (2). Ministry of Health, in the last decade, has prepared policy documents about the intervention on chronic diseases and has been taking some steps for implementing these policies (3,4). This study collected data, though limited, from the physicians about the difficulties they experienced in the diagnosis, treatment and monitoring of non-communicable diseases and the applications in chronic disease management.

19.2 Methods and Definitions

Three questions about the management of chronic diseases were prepared for the physicians participating in the survey. The question “What are the most important difficulties of providing service to people with chronic diseases?” and its options were listed (Appendix3 Survey). The physicians were asked whether they regularly used the national and/or international guidelines for the diagnosis and treatment of chronic diseases and they were requested to mark one of the option “Yes, No, or I am not informed about guidelines of this kind”. The physicians were also asked how they evaluated, in general, their proficiency in the management of chronic diseases, and were requested to mark one of the five options between “very good” and “very poor”.

19.3 Findings

According to the physicians, the most significant difficulty in providing service in management of chronic diseases that the patients do not comply the pharmacologic (61%) and the non-pharmacological therapies (25%). The patients' irregular attendance to the controls, the issues about the Health Practices Disclosure, inadequate time allocation for the patients, and disregarding the required importance on the primary health care constitute 13% of the difficulties mentioned in the survey (Table 19.1)



Table 19.1 Physicians' view of difficulties in providing service to the patients with chronic diseases, Turkey 2011.

The most significant difficulty in providing service to the patients with chronic diseases	Number	%
No compliance with the pharmacologic therapy	9539	61,4
No compliance with the non-pharmacological therapy	3924	25,3
Irregular attendance to the controls	967	6,2
Issues such as medication choice, etc. originating from the Health Practices Disclosure	348	2,2
Inadequate time allocation for the patient due to issues caused by the health system	368	2,4
Patients' disregard the importance of primary health care in the management of chronic diseases	317	2,0
Other	69	0,4
Total	15532	100,0

45% of the physicians declared that they used national and international guidelines in managing chronic diseases. 10% of the physicians stated that they were not informed about the existence of guidelines of this kind (Table 19.2).

Table 19.2 Use of national or international guidelines for chronic diseases, Turkey 2011.

Use of Manuals	Number	%
Yes, I use guidelines.	7016	45,2
No, I do not use guidelines.	6972	44,9
I am not informed about guidelines of this kind	1522	9,8
Total	15510	100,0

Table 19.3 Physicians' self evaluation of proficiency in managing chronic diseases, Turkey 2011.

Proficiency of Physicians	Number	%
Very good	849	5,4
Good	8308	53,3
Average	5805	37,2
Poor	544	3,5
Very poor	90	0,6
Total	15597	100,0

Almost 60% of the physicians evaluated their own proficiency in the management of chronic diseases as good or very good. 5% of the physicians evaluated their proficiency as poor and very poor (Table 19.3 and Figure 19.1).

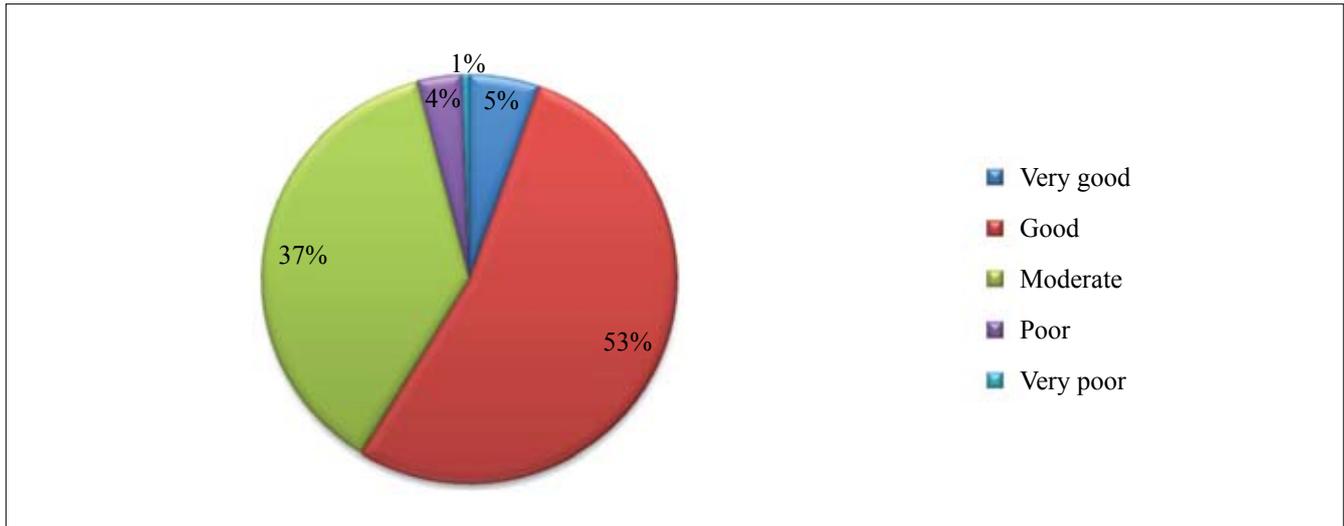


Figure 19.1 Self-evaluation of the physicians' proficiency in the management of chronic diseases, Turkey 2011.

When the use of guidelines by the physicians is considered in terms of NUTS1 regions, Western and Eastern Marmara have the highest rate with 51% and South-eastern Anatolia (34%) and North-eastern Anatolia (38%) have the lowest rates (Figure 19.2).

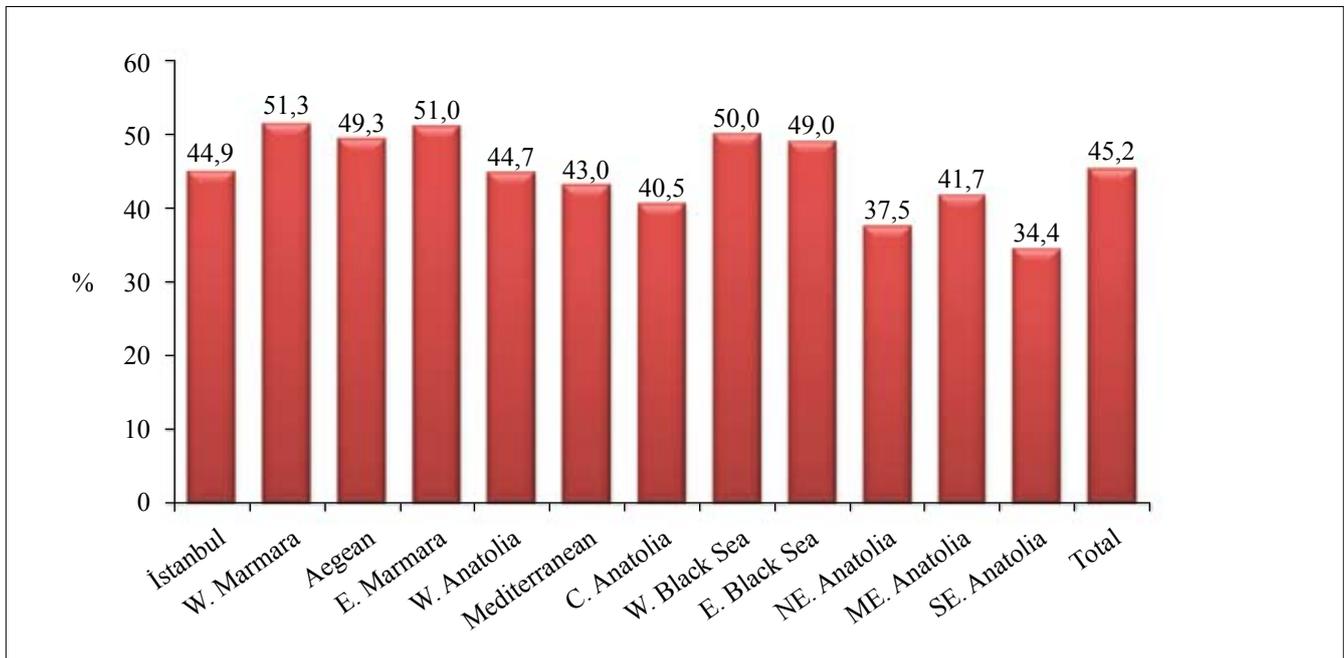


Figure 19.2 Use of guidelines by NUTS1 regions, Turkey 2011.



Table 19.4 Use of national or international guidelines by physicians according to NUTS1 regions, Turkey 2011.

NUTS1 Regions	Use of guidelines							
	Yes		No		Not informed		Total	
	n	%	n	%	n	%	n	%
İstanbul	1289	44,9	1277	44,5	306	10,7	2872	100,0
Western Marmara	386	51,3	291	38,7	75	10,0	752	100,0
Aegean	1069	49,3	920	42,4	179	8,3	2168	100,0
Eastern Marmara	796	51,0	643	41,2	122	7,8	1561	100,0
Western Anatolia	652	44,7	648	44,5	157	10,8	1457	100,0
Mediterranean	836	43,0	894	46,0	213	11,0	1943	100,0
Central Anatolia	341	40,5	425	50,5	75	8,9	841	100,0
Western Black Sea	500	50,0	421	42,1	80	8,0	1001	100,0
Eastern Black Sea	275	49,0	237	42,2	49	8,7	561	100,0
North-eastern Anatolia	156	37,5	212	51,0	48	11,5	416	100,0
Middle Eastern Anatolia	288	41,7	331	47,9	72	10,4	691	100,0
South Eastern Anatolia	428	34,4	671	53,9	146	11,7	1245	100,0
Total	7016	45,2	6970	44,9	1522	9,8	15508	100,0

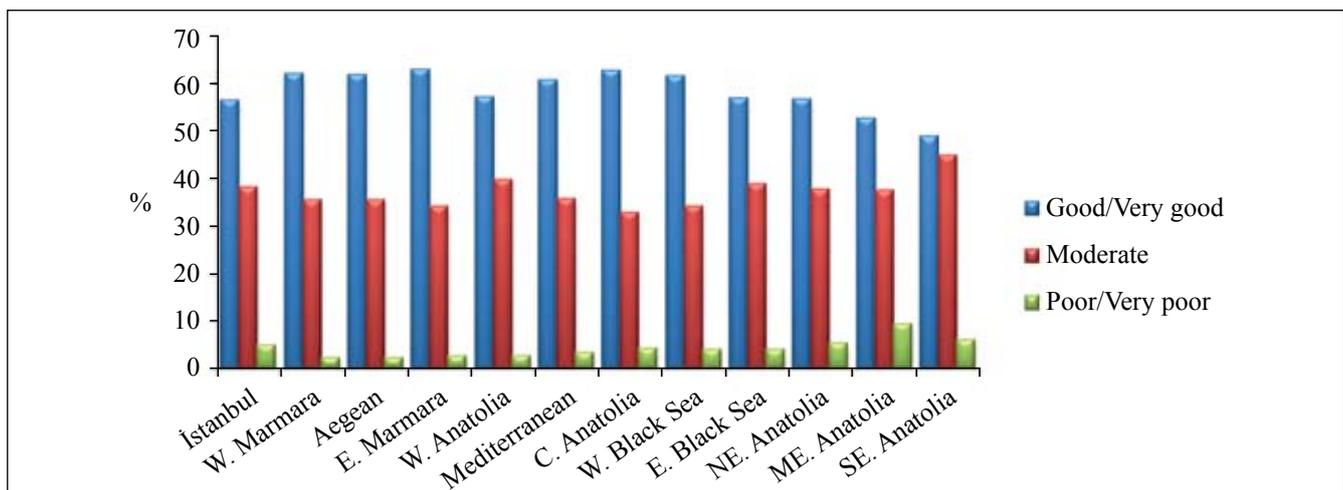


Figure 19.3 Physicians' proficiencies for the management of chronic diseases, Turkey 2011.



Differences in the physicians' proficiency for the management of chronic diseases between NUTS1 regions attract attention. It was found that the physicians in the North, Central and South-eastern Anatolia regions evaluated their own proficiency for the management of chronic diseases as poor/very poor more frequently than the physicians in other regions (Figure 19.3).

Table 19.5 Physicians' proficiency in the management of chronic diseases by NUTS1 regions, Turkey 2011.

NUTS1 Regions	Self-evaluation by the physicians					Total	
	Very good	Good	Average	Poor	Very poor	Number	%
	%	%	%	%	%		
İstanbul	6,0	50,6	38,3	4,4	0,7	2893	100,0
Western Marmara	5,0	57,0	35,6	2,2	0,1	758	100,0
Aegean	6,3	55,6	35,7	2,1	0,3	2180	100,0
Eastern Marmara	6,1	56,9	34,3	2,2	0,5	1564	100,0
Western Anatolia	4,2	53,0	39,9	2,1	0,8	1455	100,0
Mediterranean	5,7	55,1	35,8	3,2	0,2	1949	100,0
Central Anatolia	6,1	56,6	32,9	3,7	0,7	848	100,0
Western Black Sea	5,5	56,1	34,3	3,1	1,0	1012	100,0
Eastern Black Sea	3,5	53,4	39,0	3,4	0,7	567	100,0
North Eastern Black Sea	4,3	52,4	37,9	4,7	0,7	422	100,0
Middle Eastern Anatolia	4,3	48,4	37,8	8,6	0,9	694	100,0
South Eastern Anatolia	4,5	44,4	45,0	5,2	0,9	1254	100,0
Total	5,5	53,3	37,2	3,5	0,6	15596	100,0

19.4 Discussion

For the effective management of chronic diseases, the health system, especially the primary care should be developed in terms of both infrastructure and qualified labour force. Depending on the data obtained from the physicians participated in the Chronic Diseases and Risk Factors in Turkey Study, the knowledge and skills of the physicians on the management of chronic diseases should be improved.

The training of the physicians about the approaches to chronic disease should start from the medical faculties and should be continued by updating according to the requirements. Also, in addition to the basic and clinical knowledge, skills which can be used in creating a change in the behaviour of the patients and society, such as effective communication skills, effective consulting, and advocacy should be developed. It was found, in various studies, that although the physicians know that smoking is a risk factor for cardiovascular diseases, they feel themselves inadequate in approaching the patient to make them quit smoking (5).



In the diagnosis, treatment and monitoring of a chronic disease a team comprising not only a physician but also a nurse, a dietician and a psychologist should take part. Obtaining and maintaining medical behavioural changes in individuals with high risk for diseases or with chronic diseases are areas in which physicians and other medical staff should work together. Therefore, primary health care man power should be revised with regard to the management of chronic diseases.

Implementation of evidence-based guidelines in the treatment and monitoring of non-communicable diseases affects the clinical approach and treatment efficacy in a positive way. Manuals for the diagnosis, treatment and monitoring of coronary heart disease, hypertension, hyperlipidemia and diabetes were prepared for the use of physicians in the primary health care. However, guideline use could not attract enough attention due to labour burden, lack of experience and sometimes lack of knowledge.

Another significant finding of this study is the differences seen between the regions. Self-evaluations of the physicians for evidence-based disease management guidelines or the management of chronic diseases are low in Eastern Anatolia regions. Required regulations should be made in order to resolve these inequalities which may possibly affect the quality and quantity of the health service directly.



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20

Causes of Mortality





20 Causes of Mortality

Professor Gül ERGÖR

Key Findings

- Crude mortality rate is 7‰ (% 95 CI 6,4-7,7).
- 58% of the reported deaths are male, 42% are female.
- In all deaths 0 age deaths are 3% and 65-and-above deaths are 63%.
- Myocardial infarction, take the first row in causes of death by 20%.
- Cardiovascular diseases comprise the 42% of the causes of deaths.
- Cancers are second in causes of deaths with a 21% share.
- While the most prevalent cause of death in 15-24 age group males is accidents (43%), it is cardiovascular diseases in 65-and-above age group with a 54%.



20.1 Introduction

The task of gathering and publishing data on deaths in Turkey is assigned to TURKSTAT. As the number of deaths are collected in town and city centres, the data do not cover all of Turkey. In order to determine the causes of death more accurately the data collection forms were renewed in 2008, trainings were conducted in health institutions and causes of deaths were started to be encoded according to the ICD 10 standards. Another novelty is the filling out of forms in all residence areas with a physician, other than town and city centres; and the data for 2009 was published (1). In 2009 there were 367,971 deaths. Cause of death for 76% of the deaths was determined. As for that 40% of deaths were caused by circulatory system diseases, 21% by cancers, 9% by respiratory system diseases, and 6% by endocrine and metabolic diseases (2).

Cardiovascular diseases take the first place (29%) in cause of death in the world, as it is in Turkey. Second place is taken by communicable diseases (16%) and third place by cancers (12%). According to the 2004 Global Disease Burden study, 6 out of 10 deaths are caused by non-communicable diseases, 3 were caused by communicable diseases and reproductive factors, and 1 by accidents. These rates vary in accordance with different geographical regions of the world and degree of development (3). The distribution of causes, are similar to the medium income countries.

20.2 Methods and Definitions

The participants in the study were asked whether there was anyone in their household who died in the last 12 months. If there was a death, the sex, age and cause of death for this person were recorded. The causes were recorded by the physicians based on the statements of the participants. In order to calculate the crude mortality rate all household dwellers were listed. For crude mortality rate the deaths in the last 12 months were used as numerator, and the total number of dwellers was used as denominator.

20.3 Findings

There have been 444 deaths in the last 12 months in the households of the participants interviewed. There were 63,202 dwellers and accordingly crude mortality rate is 7.03‰ (95% CI 6,4-7,7). 58% of deaths were males and %42 females. When mortality is evaluated in terms of age groups it is seen that 0 age mortality is 3%, and 65-and-above mortality is 63%; mortality rates for all age groups seem compatible with TURKSTAT data (Figure 20.1).

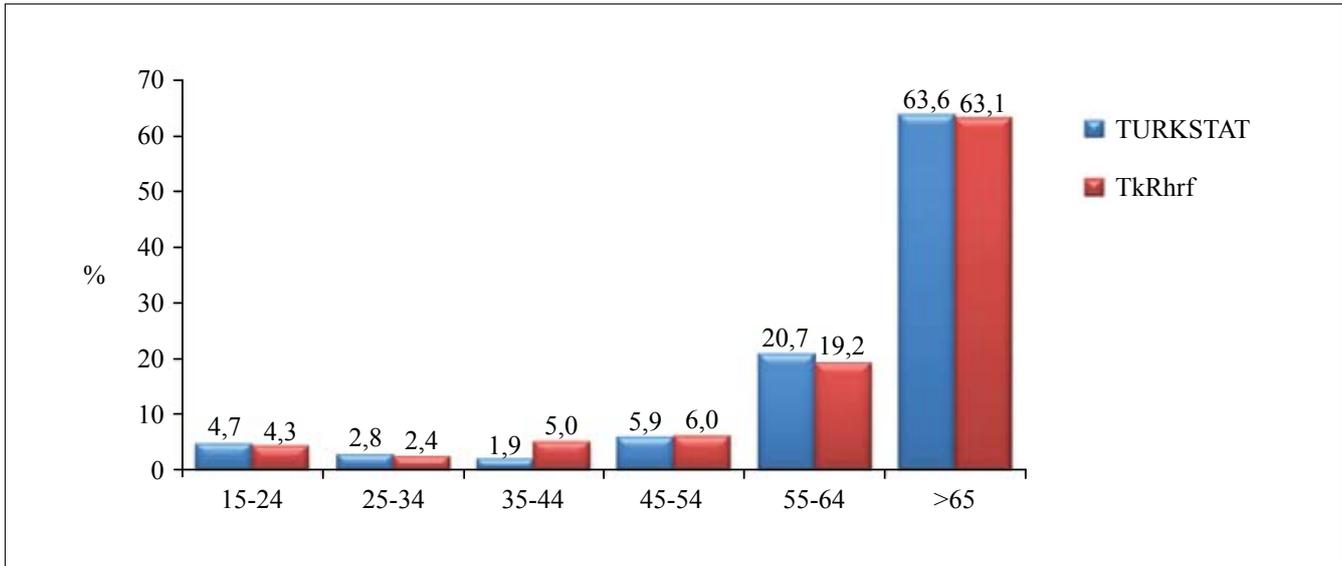


Figure 20.1 Distribution of mortality by age groups in TURKSTAT and the study population, Turkey 2011.

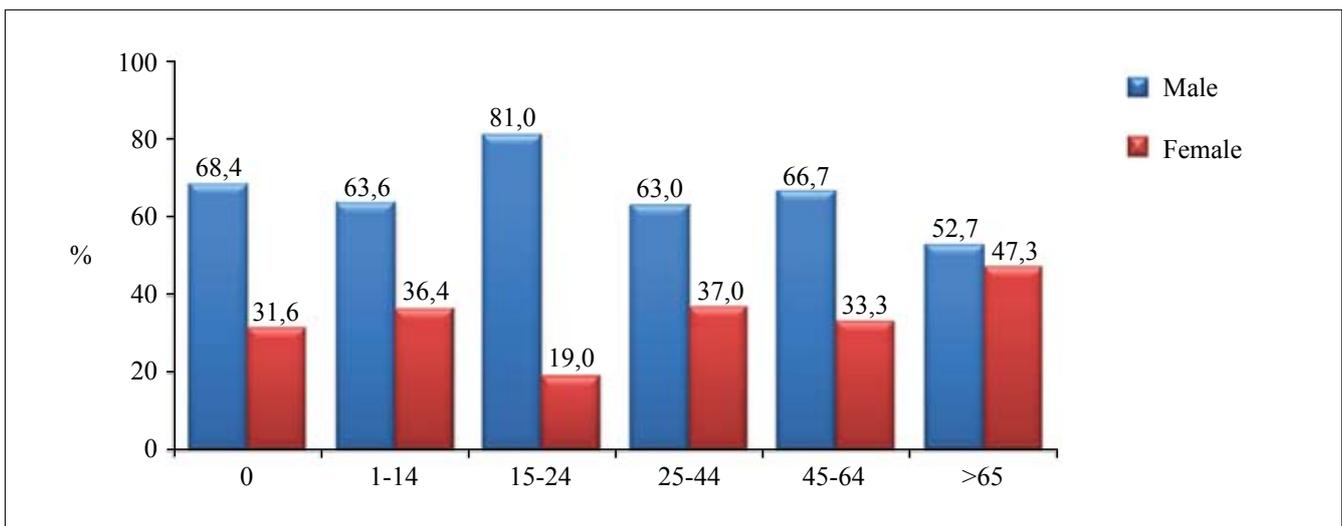


Figure 20.2 Distribution of mortality by age groups and sex, Turkey 2011.

When the distribution of mortality is evaluated in terms of age groups and sex, it is seen that mortality is higher in males in each age group; the difference between males and females is the highest in 15-24 age group; and this difference decreases to the minimum in 65-and-above age group (Figure 20.2).

Among the causes of death, myocardial infarction takes the first place with 20%. When grouped as cardiovascular diseases, these comprise 42% of mortality. The second cause after this group is the cancers (21%). COPD comprise 6% of mortality, and traffic accidents 5%.

Deaths caused by cardiovascular diseases, heart failure and strokes are seen higher in females whereas, deaths caused by myocardial infarction and cancers are seen more in males (Table 20.1). The distribution of mortality to age groups shows a variation between NUTS1 regions; at this point it should be noted that number of deaths reported from some regions were low (Table Figure 20.2).

Table 20.1 Distribution of causes of death by sex, Turkey 2011.

Cause of Death	Sex				Total	
	Males		Females		n	%
	n	%	n	%	n	%
Myocardical Infarction	58	22,5	29	15,6	87	19,6
Heart Failure	29	11,2	35	18,8	64	14,4
Stroke	13	5,0	19	10,2	32	7,2
COPD	16	6,2	10	5,4	26	5,9
Cancer	58	22,5	32	17,2	90	20,3
Kidney Failure	11	4,3	7	3,8	18	4,1
Traffic Accident	19	7,4	2	1,1	21	4,7
Occupational accident	2	0,8	-	-	2	0,5
Suicide	1	0,4	-	-	1	0,2
Infant death	13	5,0	6	3,2	19	4,3
Other	37	14,3	43	23,1	80	18,0
Unknown	1	0,4	3	1,6	4	0,9
Total	258	100,0	186	100,0	444	100,0

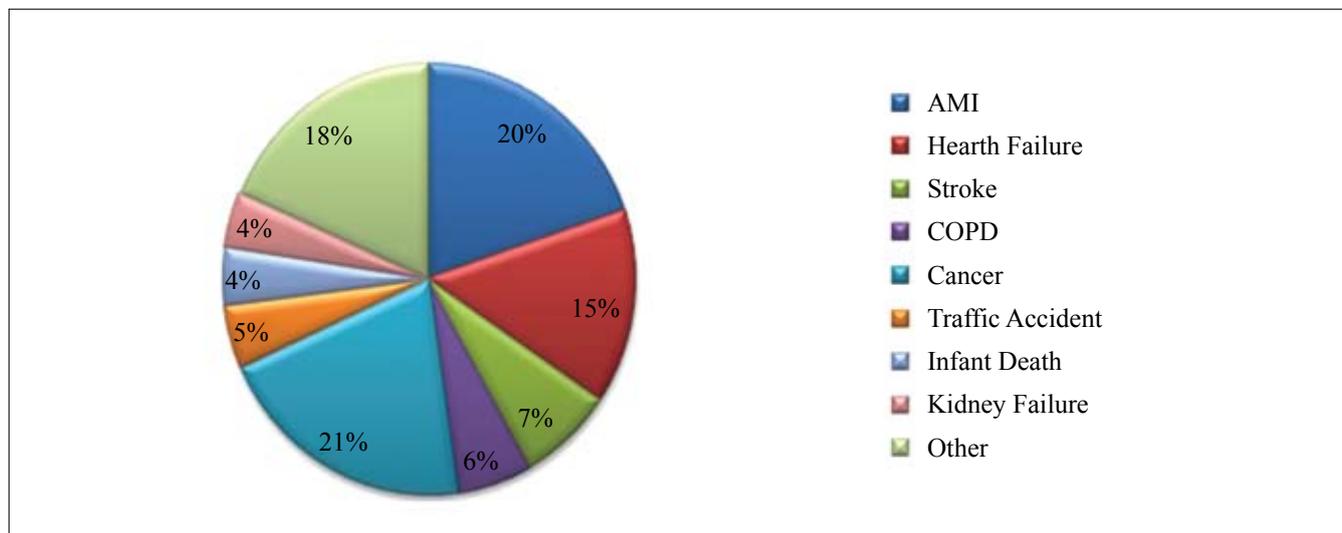


Figure 20.3 Distribution of causes of death in the last 12 months, Turkey 2011.



Table 20.2 Distribution of mortality by age groups and NUTS1 regions, Turkey 2011.

NUTS1 Regions	Age Groups						Total	
	0	1-14	15-24	25-44	45-64	> 65	Sayı	%
İstanbul	5,4	-	5,4	7,1	21,4	60,7	56	100,0
Western Marmara	-	4,5	4,5	-	13,6	77,3	22	100,0
Aegean	-	1,5	2,9	5,9	25	64,7	68	100,0
Eastern Marmara	-	-	1,6	4,9	23	70,5	61	100,0
Western Anatolia	-	-	9,4	3,1	18,8	68,8	32	100,0
Mediterranean	2,3	-	11,4	11,4	18,2	56,8	44	100,0
Central Anatolia	3,6	-	7,1	10,7	25	53,6	28	100,0
Western Black Sea	-	3,3	-	6,7	6,7	83,3	30	100,0
Eastern Black Sea	-	5,9	-	-	17,6	76,5	17	100,0
North Eastern Anatolia	13,3	-	-	-	6,7	80	15	100,0
Middle Eastern Anatolia	25	18,8	6,3	12,5	12,5	25	16	100,0
South Eastern Anatolia	16,3	4,7	2,3	2,3	20,9	53,5	43	100,0
Total	4,2	2,1	4,4	5,8	19,4	64,1	432	100,0

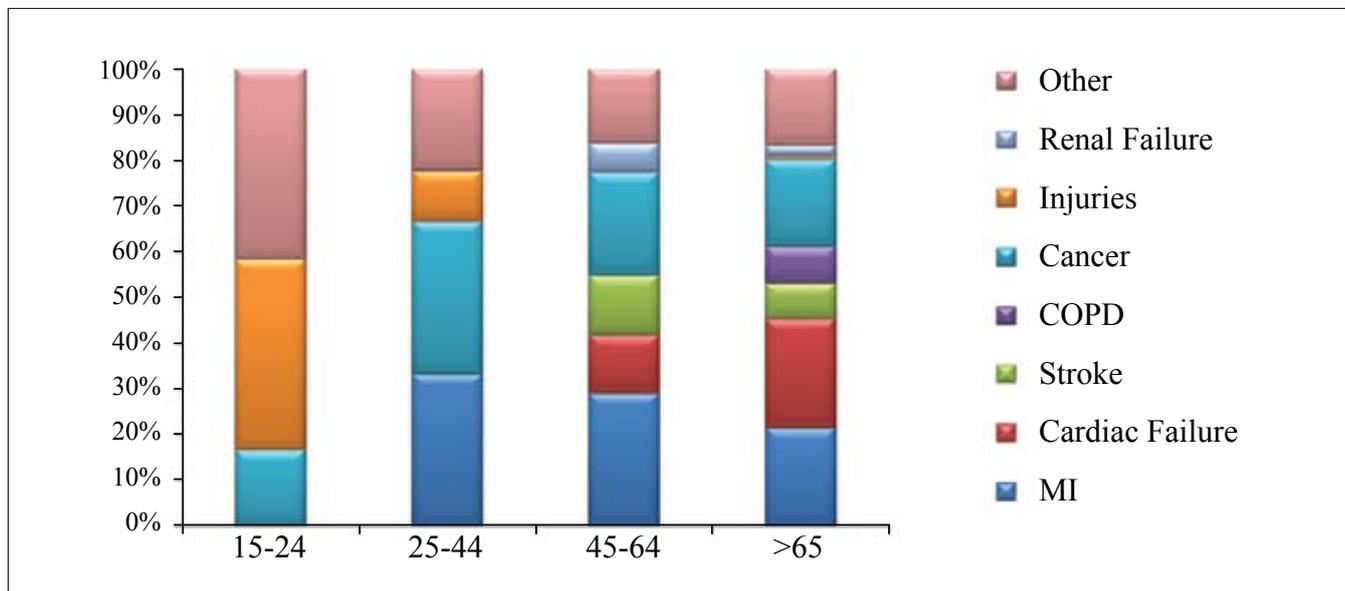


Figure 20.4 Distribution of causes of death in males by age groups, Turkey 2011.

When causes of death are evaluated in terms of age groups it is seen that the primary cause in 15-24 age group in males is accidents, while it is cardiovascular diseases in 65-and-above age group with 54% (Figure 20.4). As for females, it is again accidents in 15-24 age group, while the primary cause is cardiovascular diseases (45%) although lower than males (Figure 20.5).

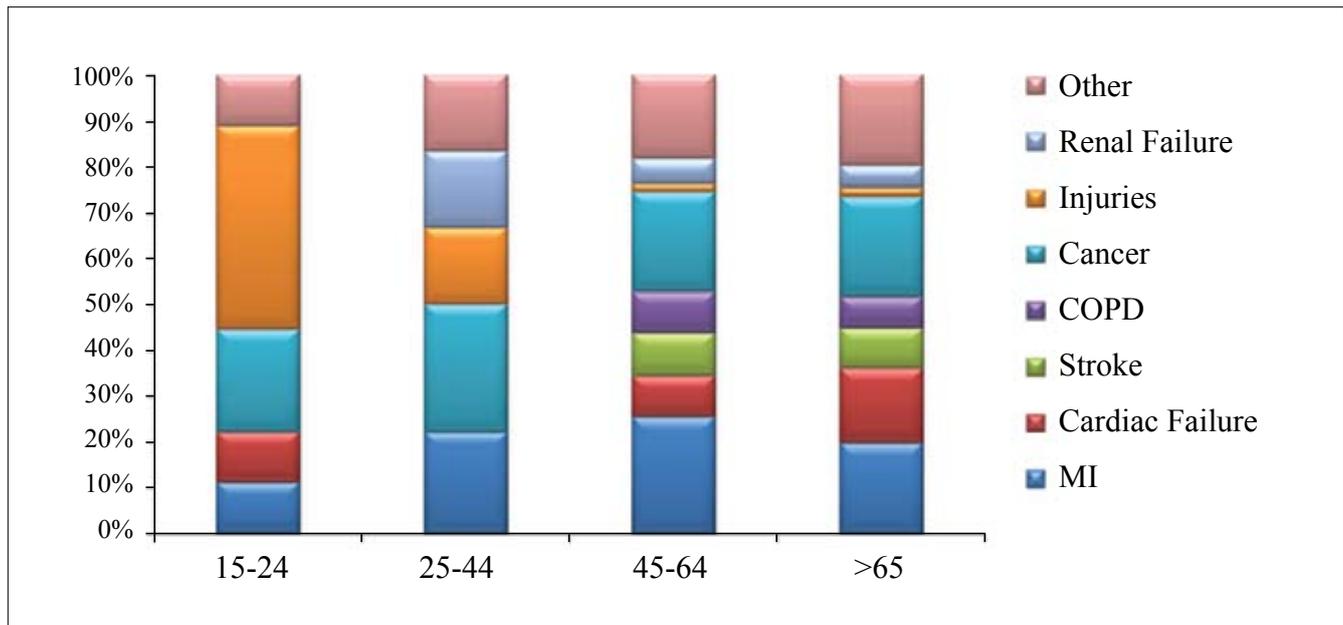


Figure 20.5 Distribution of causes death in females by age groups, Turkey 2011.

20.4 Discussion

When calculated according to the number of deaths reported to TURKSTAT, the crude mortality rate (CMR) in Turkey is approximately 5.2‰. The CMR for year 2000 was calculated as 6.3‰ in the NDB-CE study conducted in 2004 (4). When the decrease in the infant mortality rate in the last 10 years is considered, there may be some decrease in CMR, but considering the increase in the aged group, a significant difference should not be expected. CMR in this study is 7‰; this rate may have been found slightly higher due to reports for the death of family members who had not lived in the same household or reports of deaths previous to the last 12 months. Another reason for this difference may be the underreporting of youngsters and children living in the household. The high comparability of the distribution of mortality with reference to age groups, sex and NUTS1 regions to the TURKSTAT can be evaluated positively in terms of data reliability. Causes of deaths also match up with the TURKSTAT reports. Also CMR for Turkey is compatible with the global mortality rates, in terms of the geographical and economical regions.

There are still underreporting, misreporting and incompleteness in death statistics. Ministry of Health should play a more active role in resolving this issue. In the present system, three out four causes of death were determined by the municipality physicians who did not know the deceased before death. This influences the reliability of the reports. However, if family physicians are given the responsibility to determine cause of death for their patients registered on them, more healthy data would be obtained for mortality and causes.



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Appendices





21 Appendices

Appendix 1. Consent Form

CONSENT FORM

1/3 of all deaths - 16.6 million - worldwide occur due to cardiovascular diseases (coronary heart disease, stroke, hypertension, heart failure). Deaths due to cardiovascular diseases take the first place among all deaths in our country, too. Risk factors, affecting the occurrence of these diseases, are defined and these risk factors can be prevented by changing lifestyle. The aim of this survey is to determine the prevalence of risk factors and chronic diseases.

Within the framework of this aim, questions regarding lifestyle and medical condition will be asked to you and height, weight, waist and hip circumference, blood pressure, spirometry will be measured and complete urinalysis will be checked. In addition, 10 cc blood will be drawn out from veins by our nurse and preprandial blood glucose, total cholesterol, HDL and LDL cholesterol and triglyceride and creatinin will be controlled.

Your health records will be definitely kept confidential. When survey data are used in any publication or report, your name will not be used in this publication and you will not be accessible by monitoring data.

I read information, required to be given to participant before research, above. Written and oral explanations regarding these are provided to me. Under these conditions, I accept to participate in aforementioned research without any pressure or enforcement.

Participants:

Name Surname :

Date :

Signature :



Appendix 2. Organizational scheme of the study at the provincial level

PRINCIPLES TOWARDS CARRYING OUT CHRONIC DISEASES and RISK FACTORS SURVEY IN TURKEY AT THE PROVINCIAL LEVEL

Introduction

Chronic diseases increase in our country like worldwide. 70% of all deaths in our country occur due to chronic diseases and in the ranking of disease burden; they (ischemic heart diseases, cerebrovascular diseases, unipolar depression diseases, COPD, diabetes mellitus) take leading places.

A field study is planned to research current condition of chronic diseases and their risk factors, having an important place in causes of death and disease burden, to evaluate policies, implemented by our Ministry and to help to produce evidence-based policy.

The study shall include questionnaire application, physical examination and measurement transactions to 2 people to be determined by TURKSTAT randomly among population over 15, registered in Family Physicians, in 81 provinces. Questionnaire results shall be submitted to our Ministry in electronic environment and analyses shall be made according to age groups and gender in urban-rural level in distribution of NUTS1 regions.

Within the scope of tasks, authorities and responsibilities, defined in Article 4,5 and 6, Implementing Regulation on Family Medicine, published in Gazette, dated 25.May.2010 and numbered 27591, the implementation of the study by family physicians and with the help of family health workers shall have important outputs like gaining information regarding current condition as well as establishing a database and contributing to follow-up of chronic diseases and their risk factors by family physicians.

General Information Regarding Implementation

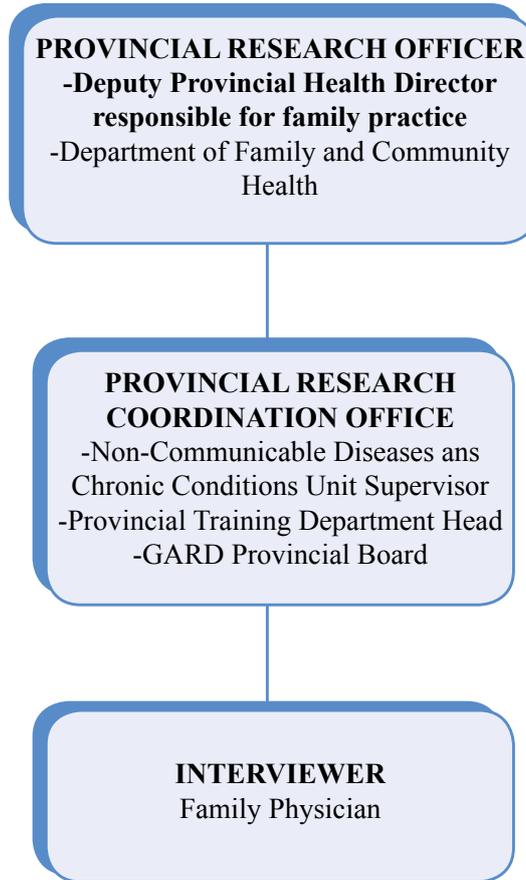
- Survey shall be carried out in our 81 provinces under the responsibility of Provincial Directorates of Health. Before the survey begins, it shall be ensured that all family physicians in the province as well as units and people in charge that shall take part in the implementation of survey in the Directorate of Health are informed about the aim, method of the study, structuring in the province and distribution of tasks by considering the province's own work procedures and principles.
- TURKSTAT has determined 2 people among population over the age of 15, registered in each family physician with random sampling technique. Questionnaire shall be carried out with these people, determined by TURKSTAT, by family physicians.
- Sampling, questionnaire and instructions, determined for each family physician, shall be included in FMIS (Family Medicine Information System) portal electronically in 13 June – 15 July 2011 and family physicians shall log in the system with their user names and passwords. But completing the implementation as soon as possible is important.
- If specified people cannot be reached due to reasons like denial, death, not accessed in their places, no substitute shall be taken. Therefore, it is expected that Family Physicians reach two people, which are determined, and they convince those people to participate as much as possible.



- If people change their family physicians in the province, provincial coordinator shall ensure that the questionnaire shall be conducted to this person by new family physician. In this circumstance, some family physicians shall include one person/people within the scope of survey in addition to 2 samples, given to them. However, if the person moves out of the province, it is not expected from family physician to apply questionnaire to this person.
- Firstly, family physicians shall call 2 people, determined in the sampling, and shall invite to Family Health Center. Family physicians shall visit people, who can not come to Family Health Center, in their homes and shall complete the study.
- For the ones, who cannot come to Family Health Centers, in case of experiencing any difficulty regarding transport, Directorates of Health shall be responsible to help family physicians.
- Blood and urine analyses shall be taken under the supervision of family physicians in family health centers and shall be carried out by laboratory, which Family Health Center has an agreement with, and results shall be filled in questionnaire form. Payments shall be made within the framework of official transactions, applied to people, affiliated to family medicine center.
- For spirometry measurement, people shall be referred to hospital, spirometry shall be made at the hospital, the person shall bring result to family physician and results shall be recorded to questionnaire form in electronic environment.
- If the person, determined by sampling, fails to bring spirometry result or does not bring spirometry result, family physician shall inform provincial research coordinatorship, spirometry result shall be learnt by provincial research coordinatorship from hospital and shall be submitted to relevant family physician and shall ensure that result is recorded to electronic internet base, where questionnaire is founded.
- If required with regard to their own tasks, Noncommunicable Diseases and Chronic Conditions Unit as provincial research coordinator shall be able to ask for help from Training Branch Directorate and GARD Provincial Board members.
- Provincial Supervisors of Research and Provincial Research Coordinatorship shall also monitor provincial sampling list and questionnaire works from result codes section in FMIS with their own user names and passwords and shall investigate whether questionnaires are applied or not, measurements are made or not and if not, they shall investigate their reasons. In addition, if required, they shall be able to communicate with family physicians from message section in FMIS.
- Questionnaires shall be applied in accordance with instructions, prepared and found under the title of “Questionnaire” in FMIS and they shall have been sent to the center together with blood and urine analysis results, until 15.July.2011 at the latest.



Structuring and distribution of tasks in the province are as follows:



Provincial Research Supervisor

The responsible person of research in the highest level in province is Deputy Provincial Health Director, responsible for family medicine activities, and is responsible for field study of research together with Family and Community Health Branch Directorate.

In addition, Provincial Research Supervisor shall work in coordination with Provincial Training Branch Director and Provincial Noncommunicable Diseases and Chronic Conditions Unit Responsible.

Provincial research shall be responsible for the following:

- to ensure and to control to gain complete and reliable data in all phases of the research from the beginning until arranging provincial report and to send data to the center in time,
- to inform relevant units in Directorate of Health and family physicians in the province about the aim and method of research and task distribution by considering the province's own procedures and principles before the beginning of the study,
- to solve all issues that may occur regarding the research at the provincial level in a short period of time and to provide required support and facilities to family physician in required subjects,
- to be in contact with the center during research continuously,



- to control conditions of laboratories, which have agreement with family physicians and from where blood and urine samples shall be taken, before the research, to fill the deficiencies in equipment that shall be used,
- to make required plannings for hospitals that people shall be referred to spirometry measurement or to have those plannings made,
- to supply vehicles, drivers etc. for people, who can not come to family health center, to meet conditions towards applying the questionnaire completely and thoroughly (taking blood and urine samples, making physical examinations, making antropometric measurements, requesting spirometry measurement and providing required device and personnel supply),
- to fix defects, informed by Provincial Research Coordination Office, in practice as soon as possible,
- to have provincial research report in the appendix prepared, approved and sent to our General Directorate with an official letter and e-mail to meltem.soylu@saglik.gov.tr; gulay.sarioglu@saglik.gov.tr at the latest until **29 July 2011**.

Provincial Research Coordination Office

Provincial Research Coordination Office comprises Provincial Training Branch Director and GARD Provincial Board Members, especially Provincial Noncommunicable Diseases and Chronic Conditions Supervisor and shall be responsible for the following;

- to ensure that access to sampling belonging to the province, sent by the Centre, is achieved in maximum level and to control the match of questionnaires, applied by family physicians with this sampling,
- to control questionnaires and examination measurement and analyses, carried out by Family Physicians, in electronic environment and in case any deficiency is detected, to inform Family and Community Health Branch Directorate,
- to prepare a summary status report, towards the part of research, carried out at the provincial level and to include no of people, accessed/not accessed, its reasons, difficulties, faced during research in the report,
- In resolving transport issues of people, who cannot come to Family Health Center, together with provincial research supervisor, Noncommunicable Diseases and Chronic Conditions Unit shall help family physicians. The Provincial Research Coordination Office shall be responsible for learning the result from hospital in case the person, determined in the sampling, fails to bring or does not bring spirometry result, and shall transmit the result to relevant family physician to record to electronic questionnaire.
- To control the implementation (by calling people who shall be selected among people, to whom



questionnaire is applied, randomly in a way to comprise minimum 20% of sampling and controlling whether questionnaires and medical examinations are made and blood and urine samples are taken with anthropometric measurement).

Interviewer

Family physician shall carry out interview with people, determined in the sampling, and shall be responsible to carry out questionnaire and other examinations and analyses correctly and completely.

Family Physician shall be responsible for the following;

- to control addresses of people, included in the sampling, received by him/her,
- in case people are not found in their own region, to inform Provincial Research Coordination Office (Provincial Training Branch Directorate, Noncommunicable Diseases and Chronic Conditions Unit),
- according to address information of person, determined in the sampling, to mark rural option in the questionnaire for regions with a population, less than 20.000 and urban option for regions with a population, more than 20.000,
- to read questionnaire instructions, active in FMIS, carefully, to call 2 people over the age of 15 and tell the aim of research and to invite Family Health Center (when people are invited, it shall be reminded that they have to come to center hungry or if their blood is not drawn when they come the center, they shall be asked to come hungry as soon as possible),
- to fill the consent form for each person, to whom questionnaire shall be applied,
- to apply questionnaire, active in 13 June 2011 and 15 July 2011 in FMIS, to make physical examinations and anthropometric measurements, to send blood and urine samples, taken by midwives and nurses, employed in FHC, under the supervision of family physician, to laboratory, to refer people to hospital for spirometry, to remind them to bring result back to himself/herself again and to record results that shall be provided to family physician by people to questionnaire form in electronic environment,
- for people, who can not come to the family health center, to print pdf format of questionnaire from FMIS web site address, to request vehicle and driver support from Provincial Research Coordination Office, to go to people's home and to apply questionnaire, to request physical examination, anthropometric measurements and blood and urine samples and spirometry measurements and then transferring results to electronic environment,
- to give feedback to people, to whom questionnaires are applied, towards examination, blood and urine analyses and spirometry results.



**PROVINCIAL REPORT OF FIELD STUDY OF CHRONIC DISEASES and
RISK FACTORS IN TURKEY**

.....PROVINCIAL DIRECTORATE OF HEALTH

...../...../2011

Beginning Date of Study	:	
Ending Date of Study	:	
No of Sampling, Belonging to the Province	:	
No of People with Completed Questionnaire	:	
No of Family Physicians in the Province	:	
No of Family Physicians, implementing the study	:	
No of People, whose Blood and Urine Results are taken	:	
No of People, whose Pulmonary Test Results are taken	:	
No of Rejections	:	
No of People, Not Accessed (Not Found)	:	
No of People, with whom Questionnaires are not completed (Interviews are interrupted)	:	
No of People, with Conditions, Preventing Interview (like Mental/Dementia etc.)	:	
No of People, controlled via telephone	:	
No of People, Confirming during Control that Questionnaires are made	:	

..... **APPROVAL**

Deputy Provincial Health
Director, Responsible for
Family Medicine

Provincial Health Director



Appendix 3. Questionnaire of the Turkish Chronic Diseases and Risk Factors Study

SURVEY FORM FOR DETERMINATION RESEARCH ON PREVALENCE AND RISK FACTORS OF CHRONIC DISEASES

Date of the Interview:/...../.....

PERSONAL INFORMATION OF THE INTERVIEWEE

Name and Surname :

TC ID No :

Province :

District :

Permanent Address :

GSM : 0...../...../.....

Phone : 0...../...../.....

Name of the registered Family Health Center :

Name of the Family Physician :

FHC Phone : 0...../...../.....

Has the approval of the interviewee been obtained for the research?	<ol style="list-style-type: none">1. Yes, oral approval has been obtained.2. Yes, written approval has been obtained.3. No, it has not been obtained.
---	---



HOUSEHOLD INFORMATION

(The individuals living in the same house will be asked and listed)

House row no	Name Surname	Relationship to the household head	Sex	Age	Level of Education
			1.Male 2.Female		1. Not literate 2. Literate 3. Primary School 4. Secondary School 5. High School 6. University 7. Post-Graduate (Master's/Ph.d.)
1 (household head)					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					

Is there anyone among the one you live with who died in **the last 12 months**?

1. Yes → Please proceed to the section “INFORMATION ON HOUSEHOLD MEMBERS WHO DIED LAST YEAR.
2. No → Please proceed to the section DESCRIPTIVE INFORMATION.

Please fill in the information below about the household members who died in **the last 12 months**.



INFORMATION ON THE HOUSEHOLD MEMBERS WHO DIED LAST YEAR.

Name and Surname of the Deceased	Please write the code about the relationship of the deceased to the household head.	Sex 1.Male 2.Female	Age	COD 1. Heart Attack 2. Heart Failure 3. Stroke 4. COPD 5. Cancer 6. Traffic Accident 7. Occupational Accident 8. Suicide 9. Infant Death 10. Kidney Disease 11. Other, please specify
	1. Oneself 2. Spouse 3. Children 4. Daughter/Son-in-Law 5. Grandchildren 6. Mother/Father 7. Mother/Father-in-law 8. Sibling 9. Other			

I. DESCRIPTIVE INFORMATION

A1. Sex	1. Male 2. Female	
A2. Date of birth/...../19.....(day/month/year)	
A3. The last school you graduated from?	1. I am not literate 2. I am literate 3. I graduated from primary school 4. I graduated from secondary school 5. I graduated from high school 6. I graduated from university/college 7. Other (Please specify.....)	
A4. What is your marital status?	1. Still married → 2. Divorced → 3. Lost spouse → 4. Still married, live apart → 5. Single, never married	A5. How old were you when you married for the first time? I married for the first time when I wasyears old.



<p>A6. Are you working at a wage-earning job already? (<u>In the last 1 month</u>)</p>	<p>A6a.</p> <ol style="list-style-type: none"> 1. Unemployed (<i>looking for jobs</i>) 2. Unemployed (<i>not looking for jobs</i>) 3. Housewife (<i>looking for jobs</i>) 4. Housewife (<i>not looking for jobs</i>) 5. Worker at a workplace such as industrial zone, factory, construction site and workshop 6. Worker at jobs such as salesclerk, waiter, and marketer 7. Worker at offices and similar jobs which require specific skills (<i>secretary, administrative staff, etc.</i>) 8. Working jobs requiring higher educations such as doctors, engineers, lawyers, teachers and nurses 9. Employer who employ 3 or more workers 10. Employer who employs less than 3 workers 11. Tradesman or craftsman who does not employ workers 12. Working jobs with irregular income (stand, lot waging or day-laboring) 13. Agricultural labour (wage labourer) 14. Agricultural labour (self employed) 15. Retired (not working) \longrightarrow 16. Retired (working) \longrightarrow 17. Student 	<p>A6b.</p> <p>Please write the code appropriate for the occupation of the interviewee before retirement (find the code referring to A6a)</p> <p>.....</p>
<p>A7. Do you have health coverage? If so which institution does provide this coverage? (You may select more than one option)</p>	<ol style="list-style-type: none"> 1. Does not have health coverage 2. Health card (green card) 3. SSK (Social Insurance Institution) 	<ol style="list-style-type: none"> 4. Bağ-kur (for the self employed) 5. State Retirement Fund 6. Private Funds (Banks, foundations, etc.) 7. Private Insurance
<p>A8. Means of heating in the household.</p>	<ol style="list-style-type: none"> 1. Stove - Coal 2. Stove - Wood 3. Natural Gas 4. Electric Heater 	<ol style="list-style-type: none"> 5. Air conditioning 6. Furnace / Fireplace 7. Dried dung 8. Geothermal
<p>Males → Please proceed to Risk Factors section</p> <p>Females, please go on.</p>		



TO BE ASKED TO FEMALES		
A9. Do you menstruate presently?	1. not started to menstruate 2. Yes, regular 3. No, irregular If 1, 2 or 3 → Please proceed to Risk Factors section	4. No, I am pregnant 5.No, I went through menopause If 4 or 5 → Please proceed to A10
A10. When was the last time you menstruated?months agoyears ago
A11. What was the reason that you went through menopause?	1. Natural menopause 2. Surgical reasons (hysterectomy, oophorectomy) 3. Hormonal reasons 4. I do not know	

II. RISK FACTORS

B. SMOKING

B1. Do you smoke?	1. No, I do not. <i>(Please proceed to B6)</i> 2. Yes, regularly <i>(at least 1 cigarette per day)(Please proceed to B3)</i> 3. Yes, sometimes <i>(Please proceed to B3)</i> 4. I was smoking. I quitte.....months ago. →	B2. How many cigarettes were you smoking during the years you smoked? 1. cigarettes per day 2. Less than 1 cigarettes per day (sometimes)
B3. How old were you when you first started smoking?years old	when I was years old (Please proceed to B7)
B4. How many cigarettes do you smoke in a day?	1. cigarettes per day, 2. Less than 1 cigarettes per day.	
B5. Have you tried quitting?	1. Yes, I have. I will try again. 2. Yes, I have. I do not think trying again. 3. No, I have not. I think about quitting. 4. No, I have not. I do not think about quitting.	
B6. Do you smoke cigars, pipe or hookah?	1. No, I do not. 2. Yes, I smoke regularly <i>(at least 1 per day)</i> 3. Yes, sometimes. 4. I was smoking regularly. I quitte..... month/year ago.	
B7. Is it allowed to smoke in the house?	1. No, it is not allowed. 2. Yes, every day. 3. Yes, sometimes.	
B8. Is it allowed to smoke at your workplace (in closed areas)?	1. No, it is not allowed. 2. Yes, every day. 3. Yes, sometimes.	



C. ALCOHOL

C1. How frequently do you drink alcohol?	<ol style="list-style-type: none"> 1. never 2. once a month or less 3. 2 -4 times a month 4. 2 - 3 times a week 5. 4 or more time a week 	
C2. In a day you drink alcohol, how much standard beverages do you drink generally ? (1 standard beverage = 1 small beer = 1 glass of wine =1 single rakı = 1 single vodka) (1 large beer=1,5 standard beverage)	<ol style="list-style-type: none"> 1. 1-2 2. 3-4 3. 5-6 4. 7-9 5. 10 or more 	
C3. How frequently you drink 5 or more standard beverages in one sitting?	<ol style="list-style-type: none"> 1. Never 2. Once a month or less 3. Once a month 4. Once a week 5. Every day or almost every day 	

D. DIET

D1. What kind of bread do you consume frequently?	<ol style="list-style-type: none"> 1. White 2. Whole-wheat, rye-bread, oat-bread 	
D2. What kind of butter/oil do you use in meals?	<ol style="list-style-type: none"> 1. Butter 2. Margarine 3. Olive Oil 4. Oils such as sunflower oil, corn oil, nut oil, etc. 	
D3. How much fruit do you consume a day? (<i>1 serving: 1apple or 1 peach or 2 tangerines or 1 slice of watermelon or 1 slice of melon or 4 apricots or 6 plums or half a pomegranate or half a grapefruit or 10 strawberries)- Please write the total fruit consumption. If there is not any consumption every day write "0".</i>	_____ serving(s)	
D4. How much vegetables do you consume a day? (<i>1 serving: 4 table spoons cooked vegetables, or one of vegetables such as carrots, tomatoes and artichokes, or a bowl of salad) Please write the total servings. If there is not any consumption every day write "0".</i>	_____ serving(s)	
D5. Do you generally add salt to the dish before tasting it?	<ol style="list-style-type: none"> 1. Yes 2. No 	



E. PHYSICAL ACTIVITY

<p>E1. Do you do sports or physical exercises?</p>	<ol style="list-style-type: none"> 1. I have never done sports/physical exercises. 2. I still do sports/physical exercises sometimes. 3. I do activities like walking at least half an hour, yard work, cycling, etc. at least three days a week. 4. I do activities like running at least half an hour, jogging, swimming, jumping, etc.
<p>E2. Approximately, how many floors do you climb up the stairs a day? (<i>1 floor=10 steps of stairs</i>)</p>	<ol style="list-style-type: none"> 1.floor (s) 2. None
<p>E3. Do you do physical activities, sports or leisure activities that last at least 10 minutes which increase your heart beat or breathing heavily? (<i>activities such as running, jogging, swimming, jumping</i>)</p>	<p>E3a.</p> <ol style="list-style-type: none"> 1. Yes → 2. No <p>E3b. days a week hours on the day I do physical activities.</p>
<p>E4. Do you do physical activities, sports or leisure activities that last at least 10 minutes which increase your heart beat or breathing moderately? (<i>activities such as walking, yard work, cycling</i>)</p>	<p>E4a.</p> <ol style="list-style-type: none"> 1. Yes → 2. No <p>E4b. days a week, hours on the day I do physical activities.</p>
<p>E5. How do you go to your work place generally?</p>	<p>E5a.</p> <ol style="list-style-type: none"> 1. On foot → 2. By own car 3. By mass transportation 4. By taxi 5. Other <p>E5b. I go in minutes.</p>
<p>E6. Approximately how many hours of the day do you spend in the house? (<i>Including sleep time</i>)</p>	<p>Week dayshours.....minutes Weekend.....hours.....minutes</p>
<p>E8. Approximately, how many hours of the day do you spend in front of a computer?</p>	<ol style="list-style-type: none"> 1. I do not use computers. 2.hours.
<p>E9. Approximately how many hours of the day do you spend watching TV?</p>	<ol style="list-style-type: none"> 1. I do not watch TV. 2.hours.
<p>E10. Have the physical activities you do in your leisure time changed in the last 6 months?</p>	<ol style="list-style-type: none"> 1. Not changed 2. Increased 3. Decreased
<p>E11. Do you think about increasing the amount of physical activities you do in your leisure time?</p>	<ol style="list-style-type: none"> 1. Yes, I do. 2. No, I do not.



E12. Please specify the most appropriate frequency for the expressions below (Will be filled out for only employed interviewees.)

	Never	Seldom	Sometimes	Frequently	Always
I generally work sitting					
I work standing					
The job I work requires me to move always					
The job I work requires me to lift heavy weights					
I feel physical exhaustion after work					
I do physical activity at my workplace enough to make me sweat					
I do physical activities, sports or leisure activities that last at least 10 minutes which increase my heart beat or breathing heavily , at my workplace (<i>activities such as running, jogging, swimming, jumping.</i>)					
I do physical activities, sports or leisure activities that last at least 10 minutes which increase my heart beat or breathing moderately (<i>activities such as walking, yard work, cycling.</i>)					

F. FAMILY HISTORY

F1. Has your mother or any of the sisters had bypass operation, balloon angioplasty, heart attack or sudden death before 65 years of age?	<ol style="list-style-type: none"> 1. Yes, the mother. 2. Yes, at least one of the sisters 3. No 4. I do not know/I am not sure 5. 1 and 2 with options
F2. Has your father or any of the brothers had bypass operation, balloon angioplasty, heart attack or sudden death before 65 years of age?	<ol style="list-style-type: none"> 1. Yes, the father. 2. Yes, at least one of the brothers 3. No 4. I do not know/I am not sure 5. 1 and 2 with options
F3. Does anybody in your family have diabetes? More than one option may be chosen.	<ol style="list-style-type: none"> 1. Yes, the mother 2. Yes, the father 3. Yes, a sibling 4. Yes, a child 5. No 6. I do not know/I am not sure 7. 1 and 2 with options
F4. Has your mother or any of the sisters had stroke or paralysis before 65 years of age?	<ol style="list-style-type: none"> 1. Yes, the mother. 2. Yes, at least one of the sisters 3. No 4. I do not know/I am not sure 5. 1 and 2 with options
F5. Has your father or any of the brothers had stroke or paralysis before 55 years of age?	<ol style="list-style-type: none"> 1. Yes, the father. 2. Yes, at least one of the brothers 3. No 4. I do not know/I am not sure 5. 1 and 2 with options



G. CHRONIC HEALTH ISSUES

ANGINA PECTORIS			
G1. Have you been informed that you had angina pectoris (chest pain due to heart condition)?	G1a. 1. Yes → 2. No 3. I do not know	G1b. Have you been offered a treatment? 1. Yes 2. No	
G2. Have you had chest pain in the last 12 months?	G2a. 1. Yes → 2. No	G2b. 1. A stinging pain 2. An astringent pain	
G3. Do you have chest pain when you climb up stairs or go up a hill?	1. Yes 2. No		
G4. Do you have chest pain when you walk normally on the pavement, without hurrying?	1. Yes 2. No		
<p>If angina pectoris diagnosis is not present up to this point (if the answer to G1 is no or I do not know) or if there is no sign of chest pain complaint (if the answers to G2, G3 and G4 are No), then please proceed to congestive heart failure questions (G11). If angina pectoris diagnosis is present (if the answer to G1 is Yes) or if there is any chest pain complaint (if the answer to at least one of G2, G3 or G4 is Yes) then proceed to G5.</p>			
G5. What would you do if you have chest pain while you are walking?	G5a. 1. I would stop/slow down → 2. I would keep on walking	G5b. 1. the pain would decrease and I would relax 2. the pain would not decrease, it would continue →	G5c. 1. Ten minutes or less 2. More than ten minutes
G6. Where do/does your chest pain(s) occur?	1. Sternum (upper or mid) 2. Sternum (lower) 3. Ribcage left side 4. Left arm 5. Other (please specify)		
G7. Have you seen any physician because of this chest pain?	G7a. 1. Yes → 2. No	G7b. Physician diagnosis 1. Angina 2. Heart attack 3. Other heart conditions 4. Coronary heart disease 5. Other.....	
G8. Have you stayed in the hospital because of this chest pain? 1. Yes → 2. No → Proceed to G9	G8a. How long ago has this pain started? →	G8b. 1. A month ago 2. Six months ago 3. A year ago 4. Two years ago 5. More than two years	G8c. Have you ever used sublingual pills to reduce the chest pain? 1. Yes 2. No



INFARCTION			
<p>G9. Have you had a very strong pain lasting half an hour or more in the front of your chest?</p>	<p>G9a. 1. Yes → 2. No → Proceed to G11</p>	<p>G9b. Have you consulted to a physician because of this pain? 1. Yes → 2. No → Proceed to G11</p>	<p>G9c. What was the diagnosis? 1. Heart attack 2. Other.....</p>
<p>G10. Have you stayed in the hospital because of this pain?</p>	<p>G10.a 1. Yes → 2. No → Proceed to G11</p>	<p>G10.b. How many times do you have heart attack? Times</p>	<p>G10c. How old were you when you first had a heart attack? years old.</p>
CONGESTIVE HEART FAILURE			
<p>G11. Do you have difficulty in breathing?</p>	<p>G11a. 1. Yes → 2. No → Proceed to H</p>	<p>G11b. 1. Waking up from sleep due to difficulty in breathing 2. Using two or more pillows 3. Swelling on ankles or legs</p>	



H. Do you have any of the chronic diseases or conditions below, diagnosed by a physician? (Please ask separately for each disease)

DIAGNOSIS	Do you have this disease?	If YES → If NO ↓	H2. When was the disease diagnosed? (If it is within the last 12 months, please specify the exact date)	Do you use any drugs regularly for this disease?	Which treatment/s are offered?
H1. Diabetes	1 Yes 2 No	→ ↓	1. Within the last 12 months/...../20... 2. Long before the last 12 months	1. Yes, I have a medical report 2. Yes, I do not have a medical report but I regularly use medication 3. No	1. Diet 2. Glucose lowering medication 3. Insulin 4. Herbal medication
H2. Hypertension (high blood pressure)	1 Yes 2 No	→ ↓	1. Within the last 12 months/...../20... 2. Long before the last 12 months	1. Yes, I have a medical report 2. Yes, I do not have a medical report but I regularly use medication 3. No	
H3. High lipid or cholesterol	1 Yes 2 No	→ ↓	1. Within the last 12 months/...../20... 2. Long before the last 12 months	1. Yes, I have a medical report 2. Yes, I do not have a medical report but I regularly use medication 3. No	1. Lipid/cholesterol lowering medication 2. Diet 3. Herbal medication
H4. Kidney Failure	1 Yes 2 No	→ ↓	1. Within the last 12 months/...../20... 2. Long before the last 12 months	1. Yes, I have a medical report 2. Yes, I do not have a medical report but I regularly use medication 3. No	1. Medication 2. Dialysis 3. Transplantation
H5. Heart Attack (MI)	1 Yes 2 No	→ ↓	1. Within the last 12 months/...../20... 2. Long before the last 12 months	1. Yes, I have a medical report 2. Yes, I do not have a medical report but I regularly use medication 3. No	



DIAGNOSIS	Do you have this disease?	If YES → If NO ↓	H2. When was the disease diagnosed? (If it is within the last 12 months, please specify the exact date)	Do you use any drugs regularly for this disease?	Which treatment/s are offered?
H6. Coronary By-pass operation	1. Yes 2. No	→ ↓	1. Within the last 12 months/...../20... 2. Long before the last 12 months	1. Yes, I have a medical report 2. Yes, I do not have a medical report but I regularly use medication 3. No	
H7. Coronary balloon angioplasty or stent application	1. Yes 2. No	→ ↓	1. Within the last 12 months/...../20... 2. Long before the last 12 months	1. Yes, I have a medical report 2. Yes, I do not have a medical report but I regularly use medication 3. No	
H8. Have you had paralysis/cerebral hemorrhage/stroke (Any unexpected disability, numbness, speech disorder, visual disorder, imbalance, disorder in eye movements in any side of the body which lasted more than 24hours)?	1. Yes 2. No	→ ↓	1. Within the last 12 months/...../20... 2. Long before the last 12 months	1. Yes, I have a medical report 2. Yes, I do not have a medical report but I regularly use medication 3. No	What kind of treatment has been used? 1. Vasodilator 2. Medication 3. Surgery 4. Carotid stent or endarterectomy
H9. Have you had temporal Stroke-Paralysis (lasting shorter than 24 hours) (in any side of your body 24 Any unexpected disability, numbness, speech disorder, visual disorder, imbalance, disorder in eye movements in any side of the body which lasted more than 24hours)?	1. Yes 2. No	→ ↓	1. Within the last 12 months/...../20... 2. Long before the last 12 months	1. Yes, I have a medical report 2. Yes, I do not have a medical report but I regularly use medication 3. No	What kind of treatment has been used? 1. Vasodilator 2. Medication 3. Surgery 4. Carotid stent or endarterectomy



DIAGNOSIS	Do you have this disease?	If YES → If NO ↓	H2. When was the disease diagnosed? (If it is within the last 12 months, please specify the exact date)	Do you use any drugs regularly for this disease?	Which treatment/s are offered?
H10. Dementia /Alzheimer's disease	1. Yes 2. No	→ ↓	1. Within the last 12 months/...../20... 2. Long before the last 12 months	1. Yes, I have a medical report 2. Yes, I do not have a medical report but I regularly use medication 3. No	
H11. Epilepsy	1. Yes 2. No	→ ↓	1. Within the last 12 months/...../20... 2. Long before the last 12 months	1. Yes, I have a medical report 2. Yes, I do not have a medical report but I regularly use medication 3. No	
H12. Parkinson's disease	1. Yes 2. No	→ ↓	1. Within the last 12 months/...../20... 2. Long before the last 12 months	1. Yes, I have a medical report 2. Yes, I do not have a medical report but I regularly use medication 3. No	
H13. Asthma	1. Yes 2. No	→ ↓	1. Within the last 12 months/...../20... 2. Long before the last 12 months	1. Yes, I have a medical report 2. Yes, I do not have a medical report but I regularly use medication 3. No	
H14. Chronic Bronchitis, Emphysema (COPD)	1. Yes 2. No	→ ↓	1. Within the last 12 months/...../20... 2. Long before the last 12 months	1. Yes, I have a medical report 2. Yes, I do not have a medical report but I regularly use medication 3. No	
H15. Depression	1. Yes 2. No	→ ↓	1. Within the last 12 months/...../20... 2. Long before the last 12 months	1. Yes, I have a medical report 2. Yes, I do not have a medical report but I regularly use medication 3. No	



DIAGNOSIS	Do you have this disease?	If YES → If NO ↓	H2. When was the disease diagnosed? (If it is within the last 12 months, please specify the exact date)	Do you use any drugs regularly for this disease?	Which treatment/s are offered?
H16. Migraine and frequent headaches	1. Yes 2. No	→ ↓	1. Within the last 12 months/...../20... 2. Long before the last 12 months	1. Yes, I have a medical report 2. Yes, I do not have a medical report but I regularly use medication 3. No	
H17. Allergic disease	1. Rhinitis-Pollinosis 2. Eczema-dermatitis 3. Food allergy 4. Drug Allergy 5. No	→ ↓	1. Within the last 12 months/...../20... 2. Long before the last 12 months	1. Yes, I have a medical report 2. Yes, I do not have a medical report but I regularly use medication 3. No	
H18. Reflux esophagitis	1. Yes 2. No	→ ↓	1. Within the last 12 months/...../20... 2. Long before the last 12 months		
H19. Tuberculosis	1. Yes 2. No	→ ↓	1. Within the last 12 months/...../20... 2. Long before the last 12 months		



DIAGNOSIS	Do you have this disease?	If YES → If NO ↓	H2. When was the disease diagnosed? (If it is within the last 12 months, please specify the exact date)	Do you use any drugs regularly for this disease?	Which treatment/s are offered?
H20. Cancer (please specify type) cancer 1. Lung 2. Breast 3. Cervix 4. Ovar 5. Corpus Uteri 6. Larynx 7. Esophagus 8. Stomach 9. Liver 10. Pancreas 11. Colon-Rectum 12. Prostate 13. Bladder 14. Leukemia 15. Lymphoma 16. Other	1. Yes 2. No	→ ↓	1. Within the last 12 months/...../20... 2. Long before the last 12 months	1. Yes, I have a medical report 2. Yes, I do not have a medical report but I regularly use medication 3. No	
H21. Cancer (please specify type) cancer (write down if there is another primary cancer) 1. Lung 2. Breast 3. Cervix 4. Ovar 5. Corpus Uteri 6. Larynx 7. Esophagus 8. Stomach 9. Liver 10. Pancreas 11. Colon-Rectum 12. Prostate 13. Bladder 14. Leukemia 15. Lymphoma 16. Other	1. Yes 2. No	→ ↓	1. Within the last 12 months/...../20... 2. Long before the last 12 months	1. Yes, I have a medical report 2. Yes, I do not have a medical report but I regularly use medication 3. No	
H22. Have you had any accidents in the last 12 months?	1. Yes 2. No	→ ↓	Please specify the types of accidents had in the last 12 months. <i>(you may check more than one options)</i> 1. Home accident 2. Traffic accident 3. Occupational accident		



DIAGNOSIS	Do you have this disease?	If YES → If NO ↓	H2. When was the disease diagnosed? (If it is within the last 12 months, please specify the exact date)	Do you use any drugs regularly for this disease?	Which treatment/s are offered?
<p>H23. Has any physician suggested changes in your life style? (Please ask one by one and mark) (<i>You may chose more than one options</i>)</p>	<p>1. Quit smoking 2. Lose weight 3. Reduce red meat consumption 4. Increase fruits and vegetables consumption 5. Reduce salt consumption 6. Use oil (instead of butter or margarine) 7. Do physical activities (walking, gymnastics, running) 8. No suggestions</p>				



I. EQ-5D GENERAL LIFE QUALITY SCALE

Please mark the statement which expresses **your health condition now** the best.

A- Movement

- 1() I do not experience any difficulty while walking
- 2() I have some difficulties while walking
- 3() I am bedridden

B- Self-care

- 1() I do not experience any difficulty caring for myself
- 2() I have some difficulties washing or dressing up by myself
- 3() I am not in a condition to wash and dress up by myself

C- Usual Activities

(i.e, working, studying, household chores, family or leisure activities)

- 1() I do not experience any difficulty doing daily deeds
- 2() I have some difficulties doing usual activities
- 3() I am not in a condition to do usual activities

D- Pain/Distress

- 1() I do not have any pain or distress
- 2() I have moderate pain or distress
- 3() I have severe pain or distress

E- Anxiety/Depression

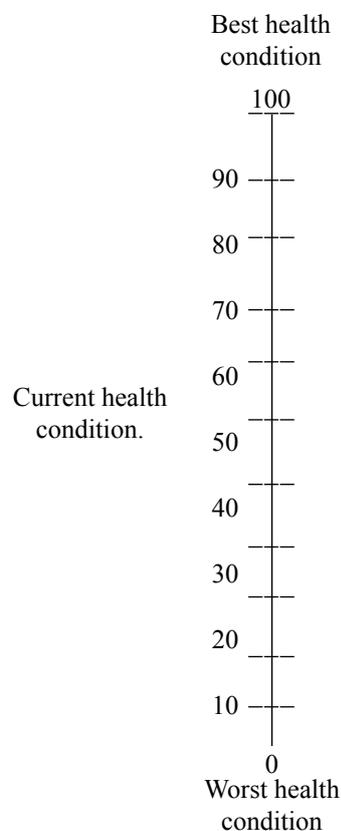
- 1() I am not anxious or in a depression
- 2() I am moderately anxious or depressed
- 3() I am heavily anxious and depressed



EQ-5D Visual Analogue Scale

We drew a scale (very similar to a thermometer) that we could represent the best imaginable health condition with 100 and the worst imaginable health condition with 0 in order to express how good or bad the health condition is. We ask of you that you mark on this scale how good or bad your **present health condition is** in your opinion. Please do this by drawing a line starting from the box below to the point that shows how good or bad your present health condition is. Your line must cross over a point on the scale.

This is a visual analogue scale; therefore please ensure that the interviewee draws a line on the paper seeing the scale. Saying a number between 0 and 100 would not yield the same results.





J.KiSA (SHORT) HEALTH SURVEY (KiSA)

J.1. How much trouble have you experienced about the problems below in the LAST MONTH?

	I have not experienced any trouble	I have experienced some trouble	I have experienced quite a trouble
a Stomach ache	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b Back ache	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c Pain in arms, legs and joints (knees, hips, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d Menstrual pain or menstrual problems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e Pain or problems during sexual intercourse	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f Head ache	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g Chest pain	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h Dizziness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i Fainting fits	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j Tachycardia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
k Difficulty in breathing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
l Constipation or diarrhoea	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
m Nausea, flatulence or indigestion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

J2. How frequently have you experienced trouble about the problems below in the LAST TWO WEEKS?

	Never	A few days	More than a week	Almost every day
a Was there a decrease in your interest in or pleasure from the things you did?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b Have you felt yourself depressed, sorrowful or hopeless?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c Have you experienced sleep-onset, sleep-maintenance difficulties or have slept too much?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d Have you felt exhaustion or fatigue?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e Have you experienced loss of appetite or have you eaten too much?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f Have you felt inefficient or have you felt that you caused frustration for yourself or your family?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g Have you experienced trouble in focusing attention in activities such as reading newspapers or watching TV?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h Have you moved or spoken too slowly that even others would notice or on the contrary have you been unable to constraint yourself for due to distress?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i Have you thought “Better off dead” or have you wanted to hurt yourself?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



J3. Questions about depression		
	NO	YES
a Have you experienced any depression fit (sudden fear or panic) in the last month?	<input type="checkbox"/>	<input type="checkbox"/>
If your answer is NO then proceed to 4th question. If your answer is YES then proceed to b.		
b Have you ever experienced such a situation before?	<input type="checkbox"/>	<input type="checkbox"/>
c Do these fits emerge suddenly in times when you are not unrestful and stressed?	<input type="checkbox"/>	<input type="checkbox"/>
d Do these fits cause excessive depression or do you feel anxious that these fits would recur?	<input type="checkbox"/>	<input type="checkbox"/>
e Have you experienced difficulty in breathing, sweating, tachycardia, dizziness or fainting fit, tingling or numbness, nausea or stomach troubles during the last depression fit?	<input type="checkbox"/>	<input type="checkbox"/>
J4. How much has any problem in the questions you answered up to now influenced your relations with others, or your fulfilling the responsibilities at home and at the workplace?		
<input type="checkbox"/> has not influenced <input type="checkbox"/> Influenced somewhat <input type="checkbox"/> Influenced pretty much <input type="checkbox"/> Influenced greatly		

J5. KISA DIAGNOSIS

Diagnosis	For the required conditions for the KISA diagnosis please mark the boxes with "X"	Does this interviewee have this health condition with regard to the required conditions for KISA diagnosis?
Somatization disorder	<input type="checkbox"/> At least three of the questions in the first section (1a-1m) should be answered as "I have experienced quite a trouble" <input type="checkbox"/> There should not be an underlying organic disease (Please check this by reviewing sections G and H)	Somatization Disorder 1. Yes 2. No
Major Depressive Disorder	<input type="checkbox"/> 2a or 2b should be answered at least as "More than one week" <input type="checkbox"/> At least five of the questions in the second section (2a-2i) should be answered as "More than one week" (If the answer to 2i is not "Never" consider it positive)	Major Depressive Disorder 1. Yes 2. No



Minor Depressive Disorder	<input type="checkbox"/> 2a or 2b should be answered at least as “More than one week” <input type="checkbox"/> 2 to 4 of the questions in the second section (2a-2i) should be answered as “More than one week” (If the answer to 2i is not “Never” consider it positive)	Minor Depressive Disorder 1. Yes 2. No
Panic Disorder	<input type="checkbox"/> All questions in the third section (3a-3e)	Panic Disorder 1. Yes 2. No
Other	<input type="checkbox"/> The conditions above are not met	

**K. PHYSICAL EXAMINATION/MEASUREMENTS**

Date of Examination:/...../.....

Finding	Result										
1. Peripheral pulses	1. Taken 2. Taken, arrhythmic 3. Not taken										
2. Jugular venous distension	1. Present 2. Not present										
3. Thyroid examination	1. Not visible or palpable 2. Palpable 3. Visible										
4. Cardiac murmur	1. Not present 2. Present (Systolic) 3. Present (Diastolic)										
5. Cardiac thrill	1. Not present 2. Present										
6. Cardiac throb	1. Rhythmic 2. Arrhythmic										
7. Lungs	1. No pathological sound 2. Pathological sound is present 3. Dyspnoea is present										
8. Liver	1. Nonpalpable 2. Palpable (Please specify size.....)										
9. Spleen	1. Nonpalpable 2. Palpable (Please specify size))										
10. Skin	1. Ecchymosis 2. purpura 3.petechia 4. other skin lesions										
11. Pretibial oedema (right leg)	1. Not Present 2. Present, (+) 3. Present, (++) 4. Present, (+++)										
11. Pretibial oedema (left leg)	1. Not present 2. Present, (+) 3. Present, (++) 4. Present, (+++)										
12. BCG scar	1. Present 2. Not present										
13. Have you had flu vaccine this year?	1. Yes 2. No										
14. Have you ever had pneumonia/pneumococcus vaccine?	1. Yesyears ago 2. No										
15. Have you had an examination or analysis for early diagnosis for cancer?	<table border="0"> <tr> <td>Females</td> <td>Males</td> </tr> <tr> <td>1. Cervical Smear</td> <td>1. Prostate examination (rectal touch)</td> </tr> <tr> <td>2. Mammography</td> <td>2. Fecal occult blood</td> </tr> <tr> <td>3. Fecal occult blood</td> <td>3. Colonoscopy</td> </tr> <tr> <td>4. Colonoscopy</td> <td></td> </tr> </table>	Females	Males	1. Cervical Smear	1. Prostate examination (rectal touch)	2. Mammography	2. Fecal occult blood	3. Fecal occult blood	3. Colonoscopy	4. Colonoscopy	
Females	Males										
1. Cervical Smear	1. Prostate examination (rectal touch)										
2. Mammography	2. Fecal occult blood										
3. Fecal occult blood	3. Colonoscopy										
4. Colonoscopy											



Appendix 4. List of scientific committee

No	NAME SURNAME	INSTITUTION
1	Professor of Medicine Lale TOKGÖZOĞLU	Hacettepe University Faculty of Medicine Cardiology Department
2	Professor of Medicine Özgür ARSLAN	Dokuz Eylül University Faculty of Medicine Cardiology Department
3	Professor of Medicine M. Kürşat KUTLUK	Dokuz Eylül University Faculty of Medicine Neurology Department
4	Professor of Medicine İlhan SATMAN	Istanbul University Faculty of Medicine Endocrinology and Metabolic Diseases Department Diseases Department
5	Professor of Medicine Arzu YORGANCIOĞLU	Celal Bayar University Faculty of Medicine Chest Diseases Department
6	Professor of Medicine Ali KOCABAŞ	Çukurova University Faculty of Medicine Chest Diseases Department
7	Professor of Medicine Nurdan KÖKTÜRK	Gazi University Faculty of Medicine Chest Diseases Department
8	Professor of Medicine Yıldız AKVARDAR	Marmara University Faculty of Medicine Psychiatry Department
9	Professor of Medicine Nazmi BİLİR	Hacettepe University Public Health Department
10	Professor of Medicine Gönül DİNÇ HORASAN	Celal Bayar University Faculty of Medicine Biostatistics Department
11	Professor of Medicine Sibel KALAÇA	Marmara University Faculty of Medicine Public Health Department
12	Professor of Medicine Gülden PEKCAN	Hacettepe University Faculty of Health Sciences Nutrition and Dietetics Department
13	Assoc. Prof. Dr. Simten MALHAN	Başkent University Faculty of Health Sciences Healthcare Management Department

***are members of “Scientific Committee” and “Monitoring Committee” constituted with the approval of Ministry of Health on April 05, 2011 MONITORING COMMITTEE**



No	NAME SURNAME	INSTITUTION
1	Seraceddin ÇOM, MD	General Director of the Primary Health Care Services General Directorate
2	Bekir KESKİNKILIÇ, MD	Deputy Director, Turkish Public Health Institution, Noncommunicable Diseases, Programs and Cancer
3	Hasan IRMAK, MD	Deputy General Director of the Primary Health Care Services General Directorate
4	Halil EKİNCİ, MD	Deputy General Director of the Primary Health Care Services General Directorate
5	Nazan YARDIM, MD, Assoc. Prof.	Directorate General of Primary Health Services, Noncommunicable Diseases and Chronic Conditions Head of Department
6	Savaş AKBIYIK ,MD	Directorate General of Primary Health Services, Environmental Health Head of Department
7	Specialist Food Eng. Cengiz KESİCİ	Directorate General of Primary Health Services, Nutrition and Physical Activity Department
8	Akfer KAHİLLİOĞLU, MD	Directorate General of Primary Health Services, Mental Health Department
9	Tacettin KAKİLİOĞLU, MD	Directorate General of Primary Health Services, Environment of Health Department
11	Ünal HÜLÜR, MD	Administrative and Financial Affairs Department
12	Dietician Dr. Meltem SOYLU Computer Engineer Kıvanç YILMAZ	Directorate General of Primary Health Services, Noncommunicable Diseases and Chronic Conditions Department Directorate General of Primary Health Services, Family Medicine Department
13	Specialist Gülay SARIOĞLU	Directorate General of Primary Health Services, Noncommunicable Diseases and Chronic Conditions Department
14	Medical Technologist Nevin ÇOBANOĞLU	Directorate General of Primary Health Services, Noncommunicable Diseases and Chronic Conditions Department
15	Mine BALLI	Directorate General of Primary Health Services, Family Medicine Department

***are members of “Scientific Committee” and “Monitoring Committee” constituted with the approval of Ministry of Health on April 05, 2011**





Republic of Turkey
Ministry of Health
Public Health Agency
of Turkey

MINISTRY OF HEALTH

Public Health Agency of Turkey

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