

A Study on Prevalence of the Non-Communicable Diseases and Related Risk Factors in Terms of Gender in Turkey

Bulaşıcı Olmayan Hastalıkların Cinsiyete Göre Prevalansları ve İlgili Risk Faktörleri Üzerine Bir Araştırma

Özlem EKMEKÇİ GÜNER¹, Hatice DÖNMEZ², Hande KONŞUK ÜNLÜ³, Şevkat BAHAR ÖZVARİŞ⁴

ABSTRACT

Aim: This study aims determine the prevalence of non-communicable diseases (NCDs) and the relation between with risk factors in terms of gender. **Methods:** Secondary analysis were conducted using Turkish Health Research 2016 database which was carried out by Turkish Statistical Institute. Data from 17,242 individuals aged 15 years old and above were included and logistic regression models were used to estimate ORs. **Results:** The prevalence of musculoskeletal, respiratory system, coronary heart, hypertension and diabetes diseases were significantly higher in women than in men. Both genders who were sedentary and smoking had increased risk of chronic respiratory system diseases. Regarding the same age groups, risks of hypertension and respiratory system diseases were higher in women. Obese men had 2.3 times of diabetes risk; OR was 3.1 in obese women. Prevalence of low education level, obesity, sedentary lifestyle, indoor exposure to tobacco smoke which were significantly higher in women, were associated with higher prevalence of NCDs among women, only alcohol intake was found to be more prevalent in men. Preventive interventions should be taken by gender sensitive approach.

Keywords: non-communicable disease; women's health; gender; risk factors

INTRODUCTION

Non-communicable diseases (NCDs) kill 41 million people each year, equivalent to 71% of all deaths globally. Each year, 15 million people die

1-Lecturer, Hacettepe University Vocational School of Health Services 06100 Sıhhiye-Ankara, Turkey. PhD Candidate at Hacettepe University Public Health Program, Ankara, Turkey.

E-mail: ozlem.ekmekci@hacettepe.edu.tr

ORCID: 0000-0002-5901-8374

2-Health Specialist, Ministry of Health, General Directorate of Health Services, Çankaya-Ankara, Turkey. PhD Candidate at Hacettepe University Public Health Program.

E-mail: haticednmez@gmail.com ORCID: 0000-0003-4011-9906

3-Lecturer, Dr., Hacettepe University Public Health Institute, 06100, Sıhhiye-Ankara, Turkey.

E-mail: hande.konsukunlu@gmail.com ORCID: 0000-0003-3572-0254

4-MD, Prof., Hacettepe University Public Health Institute, 06100, Sıhhiye-Ankara, Turkey.

E-mail: sevkatozvaris@gmail.com ORCID: 0000-0003-0650-2952

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ÖZ

Amaç: Bu çalışma bulaşıcı olmayan hastalıkların (BOH) prevalanslarını ve aynı zamanda risk faktörleri ile ilişkisini cinsiyete göre belirlemeyi amaçlamaktadır. **Yöntem:** Araştırma, sekonder analize dayalı olarak Türkiye İstatistik Kurumu (TÜİK) tarafından yürütülen 2016 Türkiye Sağlık Araştırmaları (TSA) veritabanı kullanılarak yapılmıştır. Araştırmaya 15 yaş ve üzeri 17.242 birey dahil edilmiş, veriler lojistik regresyon modeli ile incelenmiştir. **Sonuçlar:** Kas-iskelet sistemi, solunum sistemi, koroner kalp hastalıkları, hipertansiyon ve diyabet hastalıklarının görülme sıklığı kadınlarda erkeklere göre anlamlı derecede daha yüksektir. Her iki cinsiyet için sedanter olan ve sigara içtiğini belirtenlerde kronik solunum sistemi hastalıkları riski artmıştır. Aynı yaş gruplarına göre, kadınlarda hipertansiyon ve solunum sistemi hastalığı riskleri erkeklere göre daha yüksektir. Obez erkeklerde diyabet riski 2,3 kat, obez kadınlarda 3,1 kat artmıştır. Kadınlarda anlamlı biçimde daha yüksek bulunan düşük eğitim düzeyi, obezite, sedanter yaşam tarzı, kapalı mekanda tütün dumanına maruz kalma sıklıkları, BOH prevalanslarının daha yüksek olmasına neden olmaktadır. Erkeklerde yalnızca alkol tüketimi sıklığı daha yüksek bulunmuştur. Koruyucu müdahaleler cinsiyete duyarlı yaklaşımla gerçekleştirilmelidir.

Anahtar Kelimeler: Cinsiyet, Bulaşıcı olmayan hastalıklar, Kadın sağlığı, Toplumsal cinsiyet, Risk faktörleri

from a NCD between the ages of 30 and 69 years; over 85% of these “premature” deaths occur in low-and middle-income countries. Cardiovascular diseases (CVD) account for most NCDs deaths, 17.9 million deaths annually, followed by cancers (9.0 million), respiratory diseases (3.9 million) and diabetes (1.6 million). These four group of diseases account for over 80% of all premature NCDs deaths. Tobacco use, physical inactivity, harmful use of alcohol and unhealthy diet increase the risk of dying from a NCD. These diseases are driven by forces that include rapid unplanned urbanization, globalization of unhealthy lifestyles and ageing population (1-3). In both developed and developing countries, variations by gender are observed regarding the prevalence of NCDs

depending on the frequency of some risk factors, the change in lifestyle, rapidly increasing elderly population, improvement in public health science and clinic medicine (4).

According to National Burden of Disease Study conducted by Hacettepe University Institute of Population Studies, the weight of NCDs within the total burden of disease is increasing (5). With refer to Health Statistics Yearbook 2015 which is prepared by the Turkish Ministry of Health, the diseases whose percentage increased in 2013 when compared by year 2000 on the basis of DALY reasons have been reported. According to the report, the amount of increase is as follows; 80.2% increase in diabetes, 37.7% increase in backache and neck ache and, 34.8% increase in trachea, bronchial and lung cancers in men; 55.0% increase in diabetes, 36.8% increase in backache and neck ache and 29.0% increase in mental disorders in women. Research on NCDs and burden of disease indicate that variations are observed in the type, burden and prevalence of NCDs between men and women (6, 7).

In “*Final Report of Consortium on Health Inequality in European Union*” issued in 2013, it was emphasized that inequalities in education and in access to occupational health and health services in early stages of life which are based on gender and cultural background, will affect the health status of people throughout their lives. In health-related indicators, while some differences between women and men are due to biological differences, some are due to gender gap (8). 2030 Sustainable Development Goals mention “to ensure that people live a healthy life and to ensure well-being of all ages”, also “to ensure gender equality and to strengthen the social position of women and girls” (9). Within this context, it is important to reduce health-related factors, gender-based exposures and sensitivities in both women and men. At the same time, these goals will guide to ensure social equality and equity in the provision of health services and for the prevention of these diseases (10).

The aims of this study are to determine the prevalence of NCDs according to gender, their relationship with risk factors and to make

contribution to evidence-based and effective programs, systems and policies related to these risk factors in terms of gender.

METHODS

This study is based on secondary data from Turkey Health Survey (THS) conducted by Turkish Statistical Institute (TURKSTAT) to determine the overall health profile of individuals. THS which was conducted in Turkey in 2016, covers all households in all residential areas in Turkey. The THS sample, consisted of 26,075 individuals living in 9,740 households determined by two-stage stratified probability cluster sampling method for a cross-sectional epidemiological study (11).

Our study consists the data including 17,242 individuals at 15 years of age and older which were included in micro data set obtained with permission from TURKSTAT. 55.5% of the participants are women and 44.5% are men.

Analyses were conducted using the questionnaires administered by TURKSTAT as a data collection tool in THS. For the present study, socio-demographic data within the “Household Form” and the data including NCDs, physical activity status, tobacco use status, alcoholic beverage usage, height and weight status in “15 years and older age group questionnaire” were used. Body mass index (BMI) was calculated for each respondent based on the height and weight information declared by the respondents.

Respondents who had at least one of the diseases within the last 12 months such as asthma, chronic bronchitis, chronic obstructive pulmonary disease (COPD) and emphysema were regrouped as “chronic respiratory system disease”; respondents who had at least one of the diseases such as myocardial infarction or chronic results of myocardial infarction and coronary heart disease were regrouped as “coronary heart disease” (CHD); respondents who had at least one of the diseases such as problems in lumbar region and arthrosis were regrouped as “musculoskeletal system diseases” in this study. Hypertension and diabetes diseases were added to these three groups and analyses were made with these five

major diseases/disease groups. The five diseases/disease groups indicated in Table 1 were taken as dependent variables. Age, education level, marital status, working status, average monthly household income, BMI, physical activity at working/daily activities, use of tobacco, indoor exposure to tobacco smoke, allergy status, consumption of alcoholic beverages was discussed as independent variables for the risk factors. Hypertension was taken as an independent variable in some models.

Data Analysis and Evaluation

Analyses were made after regrouping the following variables; age, educational level, marital status, household's average monthly income, BMI, physical activity during working/daily activity, use of tobacco products, indoor exposure of tobacco smoke. Descriptive statistics were presented as numbers and percentages. Chi-square test was used to determine if there was any difference in the prevalence of NCDs between women and men within the last 12 months. Since there was a statistically significant difference between the prevalence of NCDs in terms of gender, logistic regression models were made for each of the five diseases/disease groups. To estimate respondents' risk of NCDs prevalence within the past 12 months, binary logistic regression model with forward selection method was established for each of the five diseases/disease groups using independent variables which are statistically significant.

In order to set the most suitable model, a variable selection process was carried out by using the forward selection model. The variables that the contribution to the model was significant were taken into the model one by one. The goodness of fit of the models were evaluated using Hosmer-Lemeshow statistics. IBM SPSS ver. 23.0 package program was used in data analysis. Statistical significance level was determined as $p < 0.05$.

As a cross-sectional study, THS sample was determined with two-stage stratified probability cluster sampling. This requires the analyses to be weighted, however, as TURKSTAT could not share the variables to be used due to the legal obligation to share personal data, all analyses

performed in this study were conducted without weighting.

RESULTS

Some of the socio-demographic characteristics of respondents are shown in Table 1. 55.5% of respondents are women. The level of education and average monthly household income which is 2,541 Turkish lira and above (\$457.8, approximate current rate) are higher in men ($p < 0.001$). The percentage of employed and physically active individuals are higher in men. The prevalence of obesity according to BMI is higher among women than in men (26% and 16.7% respectively) ($p < 0.001$). Prevalence of using tobacco products is higher in men than in women (43.0% and 18.6% respectively) ($p < 0.001$) and 77.0% of women and 71.1% of men are exposed to indoor tobacco smoke ($p < 0.001$) (Table 1).

The prevalence of NCDs by gender are shown in Table 2. Frequency of all NCDs is higher for women ($p < 0.001$). The most prevalent disease for both genders is musculoskeletal system disease. Frequency of musculoskeletal system diseases is 45.1% for women and 29.9% ($p < 0.001$) for men. While the frequency of hypertension is 23.2% for women, it is 13.7% for men ($p < 0.001$) and frequency of chronic respiratory system diseases for women is 15.4% and 9% for men ($p < 0.001$). Frequency of diabetes is 12.7% for women and 8.7% for men ($p < 0.001$); and frequency of CHD is 8.8% for women while it is found as 7.5% for men ($p < 0.001$).

The results of the logistic regression model which examines the factors that may be associated with musculoskeletal system disease are given in Table 3. Comparing the respondents of 15-34 years old with 55 years old and over group, the risk increases 2.5 times for men while it increases 5.7 times for women as the age increases. When obese and underweight/normal individuals are compared, the risk of musculoskeletal disease increases 1.8 times in women and 1.1 times in men as BMI increases. The risk for musculoskeletal system increases as educational level decreases for both men and women.

The results of the logistic regression model,

which examines the factors associated with the occurrence of hypertension are given in Table 4. The significant factors remaining in the model formed by forward conditional method are presented in the table. Comparing the respondents who are literate/did not graduate any school with respondents who have undergraduate and postgraduate education, the prevalence of hypertension increases 3.6 times in women and 1.5 times in males as the education level decreases. For both genders, the risk of hypertension is higher among unemployed respondents. With the increase in BMI, the risk of hypertension increases among both women and men.

The results of the logistic regression model, which examines the factors that may be associated with the occurrence of respiratory diseases, are given in Table 5. The significant factors remaining in the model formed by forward conditional method are presented in the table. When participants aged between 15-34 years are compared with 55 years old or older group, the risk of respiratory disease increases 2.5 times in women and 2.3 times in men with increasing age. For both male and female participants, the risk of respiratory system diseases increases among sedentary ones and tobacco users. Risk of respiratory disease increases 1.7 times in females and 1.5 times in men for daily smoking participants.

The results of logistic regression model in which the factors that may be associated with diabetes are examined are given in Table 6. The significant factors remaining in the model formed by forward conditional method are presented in the table. The prevalence of diabetes increases as the age increases for both genders. The risk for men at the age of 55 years old and above is 17.6 times greater than for those at the ages of 15-34 years old. For the same age groups, the risk increases 11.3 times for females. When obese and thin/normal participants are compared according to BMI, the risk of diabetes increases by 3.1 times among women and 2.3 times among men among for the obese respondents. The risk of diabetes increases for both genders for sedentary participants and it increases for smoking women.

The results of the logistic regression model which

examines the factors that may be associated with CHD are given in Table 7. The significant factors remaining in the model formed by forward conditional method are presented in the table. Regarding the age groups for women, the prevalence of CHD is 3.3 times higher for 55 years old and older when compared with the age group of 15-34 years old and it is 3.4 times higher for men for the same age groups. As the education level decreases, the risk of CHD for both genders increases. Risk of CHD is 1.1 times higher for obese women when compared with "thin/normal" participants. For the women who have hypertension, the risk of CHD is increased by 3.6 times. The risk of CHD increases for both genders for sedentary and smoking respondents.

DISCUSSION

The results of the study show that the prevalence of musculoskeletal, respiratory system, coronary heart, hypertension and diabetes diseases were significantly higher in women than in men. Considering the prevalence of risk factors; low education level, obesity, sedentary lifestyle, indoor exposure to tobacco smoke which were significantly higher in women, were associated with higher prevalence of NCDs among women where only alcohol intake was found to be more prevalent in men.

According to the results, 14.2% of women and 4.2% of men are illiterate which doubles the burden of risk. Low level of education creates a higher risk for these diseases in women and the level of education in women is lower. In comparison with women who has normal BMI, the prevalence of diabetes and musculoskeletal disease increases more in obese women. While 26% of the women are obese, this percentage is 16.7% for men and this finding also causes double burden. Findings on BMI and being active in daily activity support previous studies that has found that lack of physical activity is the reason of obesity (2). Findings show that nine of ten women participated within the research indicated that they were unemployed showing that share of women in working life is lower than men. The low share of women in working life suggests that women have sedentary lifestyle and also suggests

that women's participation in social life is low. These findings support the studies showing the relation between employment status and health outcomes (12, 13). In addition, there are studies indicating that sedentary lifestyle and obesity are leading determinants in most of the diseases including musculoskeletal system disease (1, 3, 14).

Although the share of tobacco use among women is 18.6%, the share of women those are exposed to indoor tobacco smoke is 77.0%. This shows that almost eight out of ten women are passive smokers although they do not smoke. Even though the prevalence of smoking respondents is higher in men than in women, the prevalence of those who stated that they had respiratory diseases due to passive smoking is more common in women than in men.

According to Lancet Global Burden of Disease data, excluding the individuals under the age of 10 and older than 94, Years Life Disabled (YLD) are higher in women than men at all ages and tend to increase gradually. The major reason that cause this increase between individuals above 10 is musculoskeletal system diseases (10). According to Hacettepe University Population Studies (HIPS) dated 2013, while ischemic heart disease took place on the top of list of ten DALY reasons for men, musculoskeletal system diseases took place on the top of the list for women (5).

According to the results of the present study, as the age increases, the prevalence of hypertension and musculoskeletal diseases increase more in women than in men. While hypertension is more common in men globally, the prevalence of hypertension is higher in women in low-income countries. In this study we also found that the prevalence of hypertension in women is higher than men. These findings support the data in 2013 WHO Global Non-communicable Diseases Report (2). The findings suggest that the frequency of hypertension increases with ageing in women, or that, apart from the age factor, the diagnosis of hypertension in women may be at an older age so there are inequalities both in access and use of health services (14, 15). Similarly, the prevalence of hypertension, CHD and musculoskeletal

diseases are higher in females among illiterate respondents compared to the undergraduate level. The findings of the study support the previous studies showing that lower education level is related with higher blood pressure (16-18).

The prevalence of respiratory system disease is higher in females among illiterate respondents and the findings support the previous studies about the risk factors of respiratory diseases including education level (19, 20).

While there are studies indicating that as women experience less symptoms of CVD, this may cause later diagnosis of CVD than men, there are also studies indicating women experience more symptoms of CVD (15, 21).

Findings support the context about the role of women in society and their equality in society as it was mentioned within the "Final Report of Health Inequality in the European Union" published in 2013. Those findings indicated that, besides biological differences, educational level and employment status, participation in social life also affect the prevalence of NCDs (8).

Within the framework of strengthening the social status of women and girls which belongs to the scope of 2030 Sustainable Development Program, health promotion and personal capacity building programs for women and the importance of reducing the sensitivity of women is becoming increasingly important (9). In addition, these goals will be a guide to ensure social equality and equity in the prevention of these diseases and in the provision of health services (10, 22). It is still under discussion whether the longer life expectancy (LE) in women affects the years of healthy life or it is the longer LE that has the disadvantages of having lower gg levels of health (14). As it is supported by many researches that almost all NCDs can be prevented, it is increasingly important to identify risk factors and take preventive measures for public health (1-3, 8). According to the findings of the study, it is suggested that the association of risk factors that are found to be more significant among women for NCDs, may be supported by further studies.

Table 1. Socio-demographic Characteristics of Individuals Included in Study (Turkey, 2016)

	Females		Males		p-value
	n	%	n	%	
	9574	55.5	7668	44.5	
Age (Groups)					
15-34	3298	34.4	2613	34.1	< 0.001
35-44	1936	20.2	1508	19.7	
45-54	1634	17.1	1373	17.9	
55 and above	2706	28.3	2174	28.3	
Education					
Illiterate	1483	15.5	211	2.8	< 0.001
Literate/Not graduated	680	7.1	274	3.6	
Primary school*	4742	49.5	4182	54.5	
High school/occ.sch.	1450	15.2	1656	21.6	
Vocational sch.	395	4.1	416	5.4	
Under/Postgraduate**	824	8.6	929	12.1	
Marital Status					
Not married	3079	32.2	2251	29.4	< 0.001
Married	6495	67.8	5417	70.6	
Employment					
Employed	2058	21.5	4399	57.4	< 0.001
Unemployed	7516	78.5	3269	42.6	
Average Monthly Household Income (Turkish lira)					
0-1.814	4833	50.5	3545	46.2	< 0.001
1.815-2.540	1726	18.1	1426	18.6	
2.541 and above	3015	31.5	2697	35.2	
Body Mass Index					
Underweight/Normal	4081	42.8	3297	43.0	< 0.001
Overweight	2982	31.3	3085	40.3	
Obesity	2476	26.0	1281	16.7	
Physical Activity					
Sedentary	4641	48.5	2716	35.4	< 0.001
Active	4933	51.5	4952	64.6	
Tobacco Use					
Never	7086	74.0	2635	34.4	< 0.001
Yes	1777	18.6	3298	43.0	
Quitted	711	7.4	1735	22.6	
Indoor exposure of tobacco smoke					
Yes	7373	77.0	5454	71.1	< 0.001
No	2201	23.0	2214	28.9	
Allergy status					
Yes	1399	14.6	613	8.0	< 0.001
No	8175	85.4	7055	92.0	
Alcohol intake					
Yes	1068	11.2	3159	41.2	< 0.001
No	8506	88.8	4509	58.8	

* General secondary school (n=1666) contains occupational or technical secondary school (n=44), elementary school (n=1266).

** Postgraduate contains the levels of 5 or 6 year faculties (n=200) and doctorate (n=29).

Table 2. Frequencies of Non-Communicable Diseases (NCDs) Included in Study (Turkey, 2016)

	Females N=9574		Males N=7668		p-value
	n	%	n	%	
Musculoskeletal System Diseases					
Yes	4320	45.1	2290	29.9	< 0.001
No	5254	54.9	5378	70.1	
Hypertension					
Yes	2218	23.2	1051	13.7	< 0.001
No	7356	76.8	6617	86.3	
Chronic Respiratory System Diseases					
Yes	1473	15.4	693	9.0	< 0.001
No	8101	84.6	6975	91.0	
Diabetes					
Yes	1214	12.7	664	8.7	< 0.001
No	8360	87.3	7004	91.3	
Coronary Heart Disease					
Yes	846	8.8	572	7.5	< 0.001
No	8728	91.2	7096	92.5	

Table 3. Association Between Prevalence of Musculoskeletal System Disease and Various Variables by Gender (Turkey, 2016)

Age (Groups)	Females ¹			Males ²		
	OR	%95 CI Lower bound – Upper bound		OR	%95 CI Lower bound – Upper bound	
15-34	1			1		
35-44	2.28	2.00	2.60	1.71	1.44	2.03
45-54	3.43	2.98	3.95	2.19	1.84	2.61
55+	5.77	5.05	6.60	2.57	2.18	3.03
Education level						
Illiterate	1.83	1.48	2.25	1.79	1.28	2.52
Literate/Not graduated	1.55	1.23	1.97	1.84	1.35	2.51
Primary/Element. School	1.33	1.11	1.59	1.16	0.96	1.40
High School/Occupational school	1.07	0.87	1.30	1.10	0.90	1.34
Vocational school	1.13	0.85	1.49	0.91	0.68	1.21
Under/Post-graduate	1					
Marital Status						
Married	1.15	1.04	1.28	1.68	1.44	1.96
Single	1			1		
Average monthly household income (Turkish lira)						
0-1.814				1.29	1.11	1.43
1.815-2.540				1.18	1.01	1.37
2.541 and above				1		
Body Mass Index						

Thin/Normal	1			1		
Overweight	1.40	1.26	1.57	1.21	1.08	1.36
Obesity	1.81	1.61	2.04	1.17	1.01	1.36
Smoking						
Never	1			1		
Yes	1.46	1.30	1.64	1.23	1.08	1.39
Quitted	1.20	1.01	1.42	1.25	1.08	1.44

Table 4. Association Between Prevalence of Hypertension and Various Variables by Gender (Turkey, 2016)

Age (Groups)	Females ¹			Males ²		
	OR	%95 CI Lower bound – Upper bound		OR	%95 CI Lower bound – Upper bound	
15-34	1			1		
35-44	3.72	2.79	4.96	4.56	3.01	6.89
45-54	10.11	7.71	13.2	9.66	6.55	14.2
55+	31.71	24.4	41.1	24.9	17.2	36.1
Education level						
Illiterate	3.24	2.18	4.83	1.45	0.97	2.16
Literate/Not graduated	3.62	2.38	5.53	1.51	1.03	2.21
Primary/Element. School	2.39	1.63	3.50	1.02	0.79	1.33
High School/Occupational school	1.75	1.15	2.66	1.03	0.76	1.39
Vocational school	1.44	0.83	2.49	0.75	0.48	1.18
Under/Post-graduate	1					
Employment						
Employed	1			1		
Unemployed	1.20	1.01	1.43	1.31	1.09	1.56
Average monthly household income (Turkish lira)						
0-1.814	1.15	0.99	1.33			
1.815-2.540	0.90	0.75	1.08			
2.541 and above	1					
Body Mass Index						
Thin/Normal	1			1		
Overweight	1.59	1.36	1.86	1.53	1.28	1.83
Obesity	2.55	2.18	2.98	2.55	2.08	3.12
Smoking						
Never	1			1		
Yes	1.26	1.07	1.50	0.79	0.65	0.96
Quitted	1.39	1.13	1.72	1.04	0.86	1.26
Alcohol intake						
Yes				1.22	1.05	1.43
No				1		

Table 5. Association Between Prevalence of Chronic Respiratory System Disease and Various Variables by Gender (Turkey, 2016)

Age (Groups)	Females ¹			Males ²		
	OR	%95 CI Lower bound – Upper bound		OR	%95 CI Lower bound – Upper bound	
15-34	1			1		
35-44	1.48	1.21	1.82	1.13	0.83	1.53
45-54	1.82	1.48	2.24	1.73	1.32	2.26
55+	2.57	2.13	3.12	2.35	1.84	3.00
Education level						
Illiterate	3.05	2.15	4.34	3.70	2.33	5.88
Literate/Not graduated	2.91	2.01	4.23	2.43	1.54	3.83
Primary/Element. School	1.89	1.37	2.62	1.95	1.40	2.72
High School/Occupational school	1.17	0.82	1.69	1.37	0.94	1.98
Vocational school	1.20	0.74	1.95	0.61	0.32	1.15
Under/Post-graduate	1					
Average monthly household income (Turkish lira)						
0-1.814	1.22	1.04	1.42			
1.815-2.540	1.16	0.96	1.40			
2.541 and above	1					
Body Mass Index						
Thin/Normal						
Overweight	1.22	1.04	1.43			
Obesity	2.01	1.72	2.36			
Daily Activity						
Sedentary	1.17	1.04	1.33	1.58	1.32	1.89
Active	1			1		
Smoking						
Never	1			1		
Yes	1.69	1.44	1.97	1.46	1.18	1.80
Quitted	1.15	0.92	1.44	1.61	1.29	2.02

Table 6. Association Between Prevalence of Diabetes Disease and Various Variables by Gender (Turkey, 2016)

Age (Groups)	Females ¹			Males ²		
	OR	%95 CI Lower bound – Upper bound		OR	%95 CI Lower bound – Upper bound	
15-34	1			1		
35-44	2.18	1.56	3.04	3.64	2.19	6.05
45-54	5.46	4.03	7.40	11.27	7.15	17.76
55+	11.35	8.50	15.16	17.60	11.36	27.25

Education level						
Illiterate	2.52	1.62	3.92			
Literate/Not graduated	2.11	1.32	3.38			
Primary/Element. School	1.84	1.20	2.82			
High School/Occupational school	1.48	0.92	2.39			
Vocational school	1.19	0.62	2.27			
Under/Post-graduate	1					
Employment						
Employed				1		
Unemployed				1.41	1.15	1.74
Body Mass Index						
Thin/Normal	1			1		
Overweight	1.79	1.48	2.18	1.54	1.24	1.90
Obesity	3.18	2.63	3.84	2.38	1.88	3.01
Daily Activity						
Sedentary	1.40	1.22	1.61	1.54	1.28	1.84
Active	1			1		
Smoking						
Never	1			1		
Yes	1.21	0.99	1.47	0.84	0.67	1.06
Quitted	1.40	1.12	1.75	1.24	1.01	1.54

Table 7. Association Between Prevalence of Coronary Heart Disease and Various Variables by Gender (Turkey, 2016)

Age (Groups)	Females ¹			Males ²		
	OR	%95 CI Lower bound – Upper bound		OR	%95 CI Lower bound – Upper bound	
15-34	1			1		
35-44	1.62	1.16	2.24	1.75	1.20	2.57
45-54	2.16	1.57	2.97	2.30	1.62	3.28
55+	3.37	2.49	4.55	3.48	2.51	4.83
Education level						
Illiterate	3.27	1.79	5.96	1.64	0.96	2.82
Literate/Not graduated	3.16	1.70	5.89	1.98	1.19	3.28
Primary/Element. School	2.39	1.34	4.28	1.31	0.89	1.93
High School/Occupational school	1.86	0.99	3.46	0.98	0.63	1.52
Vocational school	1.58	0.70	3.55	1.64	0.96	2.80
Under/Post-graduate	1			1		
Employment						
Employed				1		
Unemployed				1.37	1.09	1.72
Average monthly household income (Turkish lira)						
0-1.814	1.49	1.21	1.83	1.46	1.14	1.8

1.815-2.540	1.21	0.94	1.57	1.51	1.14	2.00
2.541 and above	1			1		
Body Mass Index						
Thin/Normal	1					
Overweight	0.93	0.76	1.14			
Obesity	1.18	0.96	1.45			
Daily Activity						
Sedentary	1.32	1.13	1.56	1.28	1.05	1.56
Active	1			1		
Smoking						
Never	1			1		
Yes	1.59	1.28	1.97	1.41	1.11	1.79
Quitted	1.52	1.17	1.97	1.44	1.13	1.83
Hypertension						
Yes	3.65	3.05	4.36			
No	1					

Strengths and limitations

THS is a household based study and was conducted by TURKSTAT on a sample representing Turkey. The study sample consists of a heterogeneous structure which represents the country population resulting the findings to be representable for Turkey. This makes the secondary analysis using THS data in this study a strong aspect of our study. As a cross-sectional study, THS sample was determined with two-stage stratified probability cluster sampling that requires the analyses to be weighted, however, as TURKSTAT could not share the variables to be used due to the legal obligation to share personal data, all analyses performed in this study were conducted without weighting. As this study is based on secondary analysis, analyses are limited with the existence of primary research data. The number of observed values were not enough for some variables taken into analysis in the model which was corrected according to all of the variables. Because of this factor, OR was found to be very high for some analysis and confidence intervals related with them were wide, so this situation formed a major limitation in this study.

CONCLUSION

Regarding the results indicating that prevalence of musculoskeletal, respiratory system, coronary heart, hypertension and diabetes diseases are

significantly higher in women than in men, priority should be given to women in prevention programs. When we consider the prevalence of risk factors of low education level, obesity, sedentary lifestyle, indoor exposure to tobacco smoke which were significantly higher in women, and which were associated with higher prevalence of NCDs among women, it is recommended to prioritise women health in health promotion programs with a multi-sectorial approach. In communities, access to health services for men and women should be based on the integrity of life, proper strategies should be developed and applied to prevent and control risk factors.

CONFLICTS OF INTEREST

We confirm that there are no conflicts of interest in this study.

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