Factors associated with risk behaviors by primary health care population in the middle Anatolia

A. KOC, M. KILIC[1]

Yıldirim Beyazit University, Health Sciences Faculty, Ankara, Turkey
[1]Bozok Uni, Health Collge, Yozgat, Turkey

Abstract. – **OBJECTIVE:** The purpose of this study was to determine the risky behaviors, together with their influencing factors, of the people who apply to primary health care (PHC) institutions in the provincial center.
MATERIALS AND METHODS: This cross-sectional study has been conducted on 1085 adults aged 18 years and over who have applied to the PHC institutions in the urban. Data have been collected through interviews and validated questionnaires.
RESULTS: While the risky behaviors most frequently observed in those who apply to the PHC institutions were inadequate consumption of vegetable and fruit, inadequate physical activity, not restricting dietary fat and salt intake, high body mass index (BMI) (90.9, 75.3, 71.1, 68.3, 65.7%, respectively). The least frequently observed ones were smoking (28.2%), alcohol intake, once a week or more frequently (1.3%). Of the participants in the study, 31.6% had three or less risky behaviors, and 36.3%, however, had five or more risky behaviors.
CONCLUSIONS: Of the primary care population, two-thirds have risky behaviors. As the age reduces, the probability of risky behavior (except high BMI) increases. It is suggested that the lifestyle of the adults who apply to health institutions be questioned and counseling be provided regarding their risky behaviors.

Key Words:
 Risky behaviors, Chronic diseases, Prevalence, Primary care, Nursing care.

Introduction

According to global status report on noncommunicable diseases (NCDs) 2010 by the World Health Organization (WHO), NCDs account for approximately 63% of deaths. About one fourth of global NCD-related deaths take place before the age of 60. Four major behavioral risk factors for NCDs are tobacco use, physical inactivity, excessive use of alcohol and unhealthy diet[1].

Again, according to the WHO's Global Health Risks report, four of the 10 foremost causes of mortality in countries with middle and high income, Turkey included, are tobacco use, physical inactivity, alcohol use, and low fruit and vegetable intake. High body mass index (BMI), which ranks third causes of mortality, results from these risky behaviors (except tobacco use)[2]. It is estimated (2008) that globally each year 6 million people die directly from smoking, or exposure to tobacco smoke, 3.2 million people from insufficient physical activity, 2.8 million people from high BMI ($\geq$ 25), 2.3 million people from alcohol use, and 1.7 million people from consumption of insufficient vegetable and fruit[1].

In addition to population wide interventions for NCDs, country health-care systems should undertake interventions for individuals who either already have NCDs or who are at high risk of developing them. Evidence from high-income countries shows that such interventions can be very effective and are also usually cost effective or low in cost. When combined, population-wide and individual interventions may save millions of lives and considerably reduce human suffering from NCDs[1]. In Turkey for both sexes, five of the seven leading risk factors in DALY (Disability Adjusted Life Years) are related with smoking, high BMI, inadequate physical activity, inadequate fruit and vegetable consumption, and excessive alcohol intake[3].

In protection against diseases, the primary prevention can be said to be 4 times more effective than the secondary and tertiary prevention[4]. Primary prevention is taken by the units which provide primary health care (PHC) services, notably family doctors. The basis of the primary prevention consists of periodic examinations, mainly immunization and counseling. It is suggested that healthy adults apply to physicians once a year for a medical control. It is also suggested that at these controls the medical history of applicants

Corresponding Author: Aysegül Koc, MD; e-mail: aysegulkocmeister@gmail.com

be taken; their height and weight be measured; their BMI be calculated; their physical activity levels, dietary, smoking and alcohol consumption habits be assessed, and accordingly appropriate counseling be provided[4]. The individuals who have applied to a health care institution, for some reason or other, be more sensitive to their health than their counterparts who have not.

The purpose of this study is to determine the major risky behaviors for non-communicable diseases in individuals who apply to PHC institutions.

Materials and Methods

This is a cross-sectional study. The population of the study, Yozgat, Turkey, has a provincial population 95667 and a metropolitan population of 75,012 (2010). Of the provincial population, 78.4% live in metropolitan Yozgat, where the population aged above 18 years numbers approximately 51,000[5]. The study was conducted on the individuals aged 18 years and over who have applied to the PHC institutions in metropolitan Yozgat. Random sampling method was used when choosing cluster sampling. Of the seven family health care centers, three – number 1, 3, and 5 – were sampled by lot. In addition, applicants to other PHC institutions – Tuberculosis dispensary, maternal and child health care, and family planning centers – were also included in the study. Pregnant women were excluded from the study. When calculating sample size, as the size of universe, the population aged 18 years and above in metropolitan Yozgat (N) was calculated to be approximately 51,000 people, the ratio of risky behaviors $p = 0.50$, differences of proportion to be d = 0.05, the significance levels to be $\alpha = 0.05$, the minimum sample size to be n = 381. Since multivariate analyses would be used depending on the socio-demographic features of research findings, it was decided that a sample should be taken at least twice as large as the size of the minimum sample. The study was conducted on 1085 subjects who verbally consented to be included in. The institutional consent for the study was obtained from Yozgat Governorship and the consent from the Ethical Committee of Yozgat State Hospital.

Data were collected through the validated structured questionnaires designed by the researcher. The questionnaires were filled out by intern nurses trained by the researcher.

Statistical Analysis

Data were analyzed using SPSS package program. For statistical assessments, correlation and Forward LR method of binary logistic analysis were used[6]. BMI was calculated using the formula weight (kg)/height (m²), and was divided into three groups as riskless BMI < 25; overweight BMI 25-29.9; and obese BMI ≥ 30. Waist circumference (WC) ≥ 102 cm in men and ≥ 88 cm in women were considered to be risky[7].

Our dependent variables included alcohol consumption once a week or more often, current smoking, high BMI (≥ 25), large WC (≥ 88 cm in women and ≥ 102 cm in men), inadequate exercise (less than three times and 150 minutes a week), low vegetable and fruit consumption (less than three times a day), dietary salt and fat without restriction. Of the independent variables age was included in the model as a continuous and categorical variable, and sex, marital status, educational status, employment status, economic status, satisfaction with life, and the presence of a disease/a health problem were included as categorical variables. Variables were included in the table when found significant the LR analysis. $p < 0.05$ was considered statistically significant.

Results

Of the respondents in the study, 60.5% were women, 75.2% married, 26.9% employed, 12.3% retired, 46.5% housewives, 56.9% older than 40 years of age and their mean age was 43.7±16.3. While 57.7% of them had no schooling or were primary school graduates (10.0% were illiterate) 15.8% were university graduates (11.2% had undergraduate degree). Of the participants, 51.1% stated that they had a disease (38.7% chronic disease) or health problem diagnosed by a physician (Table I).

Fifty-eight of 1085 respondents (5.3%) stated they had alcohol – only three people daily, 11 people several times a week, 12 people several times a month. Those who had alcohol frequently were not demonstrated in the table since they were few in number they were not included in statistical analyses, either.

Of the respondents 28.2% (43.1 of men, and 18.4% of women) stated that they had still been smoking (Table I). 56.0% (30.1% of men and 73.0% of women) stated that had never smoked, 15.8% (26.8% of men and 8.5% of women) that they had quit. The possibility of smoking was

Table I. The prevalence (n%) a of risky behaviors based on socio-demographic features in the study group.

Socio-demographic features	N (%)[b]	Current smoking	Inadequate exercise	Low vegetable and fruit consumption	Not restrict dietary salt	Not restrict dietary fat
Gender						
Male	429 (39.5)	185 (43.1)	294 (68.5)	386 (90.0)	306 (71.3)	303 (70.6)
Female	656 (60.5)	121 (18.4)	523 (79.7)	600 (91.5)	435 (66.3)	468 (71.3)
Marital status						
Married	816 (75.2)	231 (28.3)	606 (74.3)	739 (90.6)	549 (67.3)	561 (68.8)
Single	174 (16.0)	62 (35.6)	131 (75.3)	159 (91.4)	147 (84.5)	153 (87.9)
Divorced/widowed	95 (8.8)	13 (13.7)	80 (84.2)	88 (92.6)	45 (47.4)	57 (60.0)
Age group						
18- 29	267 (24.6)	94 (35.2)	206 (77.2)	250 (93.6)	222 (83.1)	229 (85.8)
30-39	201 (18.5)	75 (37.3)	166 (82.6)	187 (93.0)	161 (80.1)	153 (76.1)
40-49	213 (19.6)	68 (31.9)	162 (76.1)	194 (91.1)	147 (69.0)	147 (69.0)
50-59	181 (16.7)	41 (22.7)	134 (74.0)	158 (87.3)	106 (58.6)	118 (65.2)
≥ 60	223 (20.6)	28 (12.6)	149 (66.8)	197 (88.3)	105 (47.1)	124 (55.6)
Education level						
No schooling	145 (13.4)	11 (7.5)	117 (80.7)	129 (89.0)	72 (49.7)	82 (56.6)
Primary school	481 (44.3)	113 (23.5)	362 (75.3)	442 (91.9)	309 (64.2)	322 (66.9)
Elementary school	104 (9.6)	42 (40.4)	78 (75.0)	94 (90.4)	83 (79.8)	86 (82.7)
High school	184 (17.0)	80 (43.5)	138 (75.0)	162 (88.0)	140 (76.1)	141 (76.6)
Higher school	171 (15.8)	60 (35.1)	122 (71.3)	159 (93.0)	137 (80.1)	140 (81.9)
Employment status						
Employee	292 (26.9)	144 (49.3)	210 (71.9)	265 (90.8)	225 (77.1)	219 (75.0)
Unemployed	893 (73.1)	162 (20.4)	607 (76.5)	721 (90.9)	516 (65.1)	552 (69.6)
Economic status						
Low	285 (26.3)	83 (29.1)	229 (80.4)	265 (93.0)	193 (67.7)	193 (67.7)
Middle	606 (55.9)	163 (26.9)	444 (73.3)	545 (89.9)	415 (68.5)	437 (72.1)
High	194 (17.9)	60 (30.9)	144 (74.2)	176 (90.7)	133 (68.6)	141 (72.7)
Satisfaction with life						
Satisfied	742 (68.4)	191 (25.7)	542 (73.0)	669 (90.2)	514 (69.3)	545 (73.5)
Dissatisfied/Neutral	343 (31.6)	115 (33.5)	275 (80.2)	317 (92.4)	227 (66.2)	226 (65.9)
The presence of a disease/ a health problem						
Not have	531 (48.9)	196 (36.9)	406 (76.5)	484 (91.1)	427 (80.4)	428 (80.6)
Have	554 (51.1)	110 (19.9)	411 (74.2)	502 (90.6)	314 (56.7)	343 (61.9)
Total	1085 (100.0)	306 (28.2)	817 (75.3)	986 (90.9)	741 (68.3)	771 (71.1)

aPercentages have been taken out of the total rows the respondents.bPercentages have been taken out of the total columns.

higher approximately three times in men than in women, 2.8, 3.5, and 2.5 times in those elementary school (8 year), high school (11-12 years) and higher education, respectively than in their counterparts who had not graduated from elementary school, 1.9 times in those employed than in those unemployed, 1.8 in those who were unsatisfied with or neutral to their lives than in those satisfied, 1.4 times in the ones with a diagnosed disease or health problem than the ones without, 1.9 (1/053) times in married than in single respondents, higher in younger subjects than in older ones (Table III). Of the participants, 44.8% expressed that they always or usually had been exposed to secondhand smoke (SHS),

whereas 43.8% stated that they never had been exposed SHS indoor spaces in the most recent seven days (Table II).

It was determined that 24.7% of the participants took adequate exercise (≥ 3 times a week and 150 min.), 18.2% inadequate exercise, and 57.1% no exercise. In other words, three quarters of the participants (75.3%) took inadequate exercise (Tables I, II). More than half (153 strong) of the employed participants (288 strong) did their work sitting or standing.

Logistic regression analysis showed that inadequate exercise was greater 1.5 times in women than in men, 2.1 times in who were widowed/ divorced than those who were married, 1.5 times in

Table II. The prevalence of risky conditions or behaviors based on gender.

Risky behaviors/conditions	Male n	Male %[b]	Female n	Female %[b]	Total n	Total %[b]
Tobacco use						
Never smoked/quit	244	56.9	535	81.6	779	71.8
Some days[a]	21	4.9	40	6.1	61	5.6
Every day[a]	164	38.2	81	12.3	245	22.6
Secondhand smoke[c]						
Never	181	42.6	289	44.7	470	43.8
Rarely/sometimes[a]	51	12.0	71	11.0	122	11.4
Usually/always[a]	193	45.4	287	44.4	480	44.8
Exercise a week						
≥ 3 times and 150 minutes	135	31.5	133	20.3	268	24.7
Inadequate[a]	79	18.4	119	18.1	198	18.2
Never exercise[a]	215	50.1	404	61.6	619	57.1
Vegetable and fruit consumption a day						
≥ 3 times a day	43	10.0	56	8.5	99	9.1
1-2 times a day[a]	334	77.9	509	77.6	843	77.7
Not every day[a]	52	12.1	91	13.9	143	13.2
Dietary salt						
No salt/low salt	123	28.7	221	33.7	344	31.7
Moderate salt[a]	249	58.0	355	54.1	604	55.7
Salty/very salty[a]	57	13.3	80	12.2	137	12.6
Dietary fat						
No fat/low fat	126	29.4	188	28.7	314	28.9
Moderate fat[a]	258	60.1	429	65.4	687	63.3
Fat/high-fat[a]	45	10.5	39	5.9	84	7.7
BMI (kg/m²)						
< 25	151	35.2	221	33.7	372	34.3
25-29.9[a]	180	42.0	195	29.7	375	34.6
≥ 30[a]	98	22.8	240	36.6	338	31.2
Waist circumference (F/M)						
< 80/94 cm	175	42.3	165	25.9	340	32.3
80-87/94-101 cm	121	29.2	105	16.5	226	21.5
≥ 88/102 cm[a]	118	28.5	368	57.7	486	46.2
Total	**429**	**100.0**	**656**	**100.0**	**1085**	**100.0**

[a]Risky behaviors/conditions. [b]Percentages have been taken out of the total columns of the respondents. [c]Exposure to cigarette. smoke within the last 7 days.

those unsatisfied with or neutral to their lives than those who were satisfied, and finally in younger people than in older ones (Table III).

It was found that 9.1% of the subjects consumed adequate (≥ 3 times a day) vegetable and fruit, 77.7% of them 1-2 times a day, and 13.2% not every day, and thus that 90.9% of them did not consume sufficient vegetable and fruit (Tables I, II). While the probability of consuming insufficient vegetable and fruit was higher in younger respondents only than in older subjects, the effects of the other variables were not found significant (Table III).

Of the respondents, 31.7% stated that their diets contained little or no salt, 55.7% moderate amount of salt, and 12.6% excessive salt. The ra-

tio of those who had not a low salt diet was 68.3% (Table II). The probability of not restricting dietary salt intake is 1.6 and 1.9 times higher in men and those having a disease or a health problem than women and those without a disease or a health problem, respectively. It is also higher in younger people than in older ones (Table III).

Of the participants, 28.9% stated that their diet generally contained low fat/ no fat, 63.3% moderate amount of fat, and 7.7% fatty. The ratio of the respondents who do not restrict dietary fat is 71.1% (Table II). The probability of non-compliance with dietary fat restriction is 1.3 times higher in respondents dissatisfied with or neutral their lives than those who are satisfied, 1.9 times higher in the respondents without a disease or a health

Table III. Logistic regression analysis of the variables likely to affect risky behaviors or conditions.

Independent variables	Risky behaviors/conditions (dependent variables)					
	Current smoking OR (95% CI)	Inadequate exercise OR (95% CI)	Low vegetable and fruit consumption OR (95% CI)	BMI ≥ 25[a] OR (95% CI)	Not restrict dietary salt[b] OR (95% CI)	Not restrict dietary salt OR (95% CI)
Gender						
Female	Reference	11.51 (1.12-2.03)				Reference
Male	2.98 (2.05-4.34)	Reference				1.61 (1.19-2.17)
Marital status						
Married	Reference	Reference		Reference		
Single		0.53 (0.32-0.87)	0.64 (0.40-1.01)		0.25 (0.15-0.42)	
Divorced/ widowed		1.14 (0.57-2.28)	2.07 (1.11-3.83)		0.54 (0.31-0.96)	
Age (continuously variable)	0.97 (0.95-0.98)	0.98 (0.97-0.99)	0.98 (0.97-0.99)	1.02 (1.01-10.4)	0.98 (0.97-0.99)	0.96 (0.95-0.97)
Education level						
No schooling	Reference			3.03 (1.53-5.97)		
Primary school	1.99 (0.99-4.00)			3.13 (1.89-5.18)		
Elementary school	2.76 (1.22-6.21)			1.66 (0.91-3.01)		
High school	3.53 (1.62-7.72)			1.03 (0.62-1.68)		
Higher school	2.46 (1.09-5.56)			Reference	Reference	
Life satisfaction						
Satisfied	Reference	Reference			Reference	
Neutral/Dissatisfied	1.82 (1.32-2.51)	1.53 (1.12-2.11)			1.34 (1.01-1.79)	
Employ-ment status						
Employed	1.87 (1.32-2.67)					
Unemployed	Reference					
Disease/health problem						
Have	Reference			1.84 (1.35-2.52)	Reference	
Not have	1.40 (1.02-1.93)			Reference	1.97 (1.46-2.64)	
Econo-mic status						
Low				Reference		Reference
Middle				1.44 (1.01-2.06)		1.92 (1.42-2.58)
High				1.86 (1.15-3.03)		

Independent variables: Gender, marital status, age, education, employment, income level, satisfaction with life and having a diagnosed disease or health problem [a]In addition, consumption of vegetable and fruit, and taking exercise were added to the model. [b]In addition, BMI was added to the model.

problem than those with, and again higher in younger people than in older ones. We did not find statistically significant relationships between participant levels of BMI and dietary fat (Table III). As the tendency to have a diet with excessive salt content increases, the tendency to have a fatty diet also increases (Spearman's r = 0.32 p < 0.001). The percentage of the respondents who stated that they generally consumed saturated fat was 8.5%.

The participants who had normal BMI (< 25 kg/m²) by 34.3%, were overweight (BMI 25-29.9 kg/m²) by 34.6%, were obese (≥ 30 kg/m²) by 31.2%, and in total they had high BMI (≥ 25 kg/m²) by 65.7% (Tables I, II). The probability of having high BMI was 3.9 (1/0253) and 1.8 times higher in married than in single and divorced/widowed participants, respectively; 3.0 and 3.1 times higher in those with no schooling and in primary school (5 years) graduates than in university graduates, respectively; 1.4 and 1.9 times higher in those with medium and high economic status than in low economic status, respectively; 1.8 times higher in those with a diagnosed disease or a health problem than those without, and again higher in older respondents than in younger ones (Table III).

The respondents' waist circumference (WC) was found to be risky level by 46.2% (≥ 88 cm in women and 102 cm in men). There were twice as many women with risky waistline (57.7%) as their male (28.5%) counterparts (Table II). As the age of the participants rose, BMI (r = 0.40, p < 0.001) and WC (r = 0.46, p < 0.001) also rose. Again there was a strong correlation between BMI and waistline (r = 0.71, p < 0.001).

When the respondents' seven risky behaviors – alcohol consumption once a week or more often,

smoking currently, having high BMI, taking inadequate exercise, inadequate consumption of vegetable and fruit, dietary non-restriction of salt and fat intake – were assessed together, it was found that 31.6% of them had three or fewer, and 36.3% had five or more risky behaviors (Table IV).

Discussion

Assessed in this study are major risky behaviors of the respondents who have applied to PHC institutions, and the factors influencing these parameters. Of the 1085 respondents in the study, three stated that they had alcohol every day, and 11 several times a week, totally corresponding to 5.3% of all the respondents. Of the health workers in Yozgat provincial center, 3.0% of consume alcohol once a week or more frequently, and 12.4% rarely[8]. National Household Survey (NHS) done in Turkey in 2003 revealed that 2.2% of men and 0.1% of women consumed alcohol once a week or more frequently[9]. In 2006, however, these figures increased to 6.4% and 1.9%, respectively[10]. Turkish Health Survey (THS) of 2010, on the other hand, revealed that 23% of the men and 5.7 of the women living in urban areas consumed alcohol[11]. In the U.S. (2007) 15.7% of adult population consumed alcohol in moderate quantities, and 5.2% in excess quantities, while in Denmark (2000) 15% of men and 9% of women consume alcohol in excessive quantities[12,13]. The ratio of the respondents who consume alcohol once a week or oftener is much lower than that of overall Turkey and that of the health workers in the same province. It is also lower than those of American and Danish society.

Table IV. The number of risky behavior based on the gender in the study group.

Risky behaviors[a]	Gender					
	Male		Female		Total	
	n	%	n	%	n	%
1-2[b]	38	8.9	62	9.5	100	9.2
3	88	20.6	155	23.6	243	22.4
4	122	28.5	225	34.3	347	32.0
5	140	32.7	183	27.9	323	29.8
6-7[c]	40	9.3	31	4.7	71	6.5
Total	**429**	**100.0**	**656**	**100.0**	**1084**	**100.0**

[a]Risky behaviors: Alcohol consumption once a week or more often, current smoking, high BMI (≥ 25 kg/m²), inadequate exercise (< 3 times and 150 minutes a week), low vegetable and fruit consumption (< 3 times a day), dietary salt and fat without restriction. [a]One person had no risky behavior. [b]Twelve people had one risky behavior. [c]Two people had seven risky behaviors.

Of the respondents in our study 28.2% (18.4% of women and 43.1% of men) had still been smokers (Tables I, II). Of the people who apply to the PHC institutions in Istanbul 36.2%, of the health workers in Yozgat provincial center 43.1%, and of the physical education and sports teachers in Turkey 65.2% are current smokers[8,14,15]. According to countrywide studies in Turkey, 31.2% of those aged 15 years and above (2008), (47.9% of men and 15.2% of women) are current smokers[16]. According to THS 2010, 29.5% (43.5% of men and 16.0% of women) are still smokers[11]. Finally, according to the U.S. BRESS 2007, 19.7% of those aged 18 years and above, 39% of Danish men (2000) and 35% of Danish women are smokers[12,13]. The ratio of smoking in low and middle income countries is in 16% (in Mexico)-43% (in Bangladesh) range[17]. While the ratio of the smokers in our study group bears resemblance to those in low and middle income countries and the overall ratio in Turkey, it is lower than the ratio of the smokers among health workers in the same provincial center.

Of the respondents, 44.8% stated that they had usually/always been exposed to secondhand smoke in indoor spaces within the last 7 days, and 43.8% stated that they had never been exposed to it (Table II). According to a study done in Turkey in 2008, 38.5% of the people aged 15 years and above (31.6% of non-smokers), and 41.1-59.7% are exposed to tobacco smoke in work places and homes, respectively[16]. The ratio of exposure to tobacco smoke in low and middle income countries varies between 16% (Uruguay) and 57% (Egypt)[17]. In the study group, the ratio of exposure to tobacco smoke is at a level similar to those in low and middle income countries and that which is overall for Turkey.

It was detected that 75.3% of the participants did not get adequate exercise (≥ 3 days a week and 150 minutes) and 57.1% did not get any exercise whatsoever (Tables I, II). It has been detected (2003) that 35.1-36.3% of the adults in Turkey, 92.4% of those applying to the PHC institutions in Istanbul, 79.8% of the health workers in Yozgat provincial center, and 60.1% of women aged 15 years and above in Van do not get sufficient exercise[8,9,14,18]. The ratio of physically inactive population in Denmark is 20-22% (2000) whereas it is 63.0% in WHO European region, and 50.8% in the U.S.[2,13,19]. The participants in our study have taken less physical exercise than Turkish, European, and American societies.

According to the National Health Survey done in the U.S., the consumption of at least 3.5 portions of vegetable and fruit is taken as reference point in risk assessment[20]. Of the participants, 90.9% stated that they consumed inadequate (< 3 portions a day) vegetable and fruit (Tables I, II). The probability of consuming inadequate vegetable and fruit is higher in younger people than in older ones only (Table III). Of the health workers in Yozgat provincial center, 87% consume vegetable and fruit fewer than three times a day[8]. It has been determined that Turkish people aged 18 years and above consume on average 3.2 portions of vegetable and fruit daily, while 81.1% and 43.2% of them consume fewer than five and three portions, respectively[21]. According to the THS of 2010, 86.1% of the urban populations aged over 15 years consume fruit on4ce a day or less frequently, 82.0% consume vegetable once a day or less frequently[11]. While the proportion of those who consume inadequate vegetable or fruit is 56% in the WHO European region, compared to 75.7% in the U.S.[2,12]. While the participants in our study consume vegetable and fruit in quantities similar to those consumed by the health workers in the same provincial center, their consumption is proportionally less than in that in Turkey and the U.S. and even less than that of the European Society.

The SALT Turk study of 2008 determined that daily mean salt consumption was 18 g/day, which is more than three times higher than the allowable[22]. Of the participants in our study, 68.3% stated that they did not restrict their salt intake (Table II). It was detected that 75.0 of the adults in Turkey (NHS-2003) and 77.8% of the health workers in Yozgat center did not restrict their salt intake[8,9]. The ratio of those in the study group who do not restrict salt intake somewhat below that of the health workers in the same provincial center and that of overall mean of Turkey.

A global increase has been observed in total consumption of dietary fat during the period from 1960 to 2007[1]. Restriction of fat intake is important in preventing high BMI[23]. Of the respondents, 71.1% stated that they did not restrict their dietary fat intake (Tables I, II). It has been determined that 80.6% of the health workers in provincial Yozgat, and 85.6% of the hypertensive patients who have applied to a community health care center in Ankara do not comply with dietary fat restriction[8,24]. That 67.5% of the respondents are overweight/ obese suggests that their diets

which that qualify as containing normal quantity of fat may in fact contain more fat. Respondents in this study have behaved a little responsibly to dietary fat restriction than the health workers in the same provincial center and the hypertensive patients in Ankara.

It was determined 34.6% of the respondents were overweight (BMI 25-29.9 kg/m²), 31.2% were obese (BMI ≥ 30 kg/m²) and in total 65.7% had high BMI (BMI ≥ 25 kg/m²) (Tables I, II). A study conducted in Mersin has revealed that 38.4% of those aged 20-74 years are overweight, 29.3% were obese, and in total 67.7% had high BMI[25]. The studies done in Turkey in 2008, however, demonstrated that 68.6% of the people aged 18 years and above had BMI ≥ 25, and THS 2010, on the other hand, demonstrated that 50.0% of the people aged 15 years and above had high BMI ≥ 25 kg/m² (33.1% overweight and 16.9% obese)[11,22]. The proportion of the people with BMI ≥ 25 kg/m² is 68% in the U.S. (33.8% obese), 50% and 34% in men and women respectively in Denmark (2000)[13,26]. Of the health care workers in provincial Yozgat, 39.4% are overweight, 11.8% are obese and in total 51.2% are heavier than normal[8]. The proportion of the respondents with high BMI is similar to that of the adults in Mersin, in Turkey and the U.S. but higher than that of the health care workers in the same provincial center.

Independent of other risk factors the mortality risk in people with very wide waist circumference is two-fold higher in both sexes those with normal waist circumference[27]. Abdominal obesity ratio of the respondents (women ≥ 88 cm, and men ≥ 102 cm) is 46.2%. This ratio is twice as great in women (57.7%) as in men (28.5%) (Table II). There is a strong correlation between the BMI and waist circumference of the respondents (r = 0.71, $p < 0.001$). The study on 20-74 year-olds in Mersin has shown that the prevalence of abdominal obesity was 35.8% (45.5% for women and 22.9% for men)[25]. The ratio of obesity in the U.S. rose to 52.1% from 38.7% in the 15-year period from 1988 to 2004 (it rose from 47.0 to 61.3% in women and 29.5 to 42.4% in men)[28]. While the prevalence of abdominal obesity in the respondents in our study is higher than that of the adults in Mersin, it is lower than that in American adults.

Whereas the most common risky behavior in those who apply to the PHC institutions are inadequate consumption of vegetable and fruit, inadequate physical exercise, incompliance with the dietary restriction of salt and fat, and having high BMI (90.9%, 75.3%, 71.1%, 68.3%, and 65.7%, respectively), the least common ones are smoking (29.2%) and alcohol consumption once a week or more frequently (1.3%). Of the respondents, 31.6% had three and below, and 36.3% had five and above risky behaviors. The ratio of risky behaviors in those who have applied to PHC centers is similar to that of overall Turkey.

Conclusions

It can be said that those who apply to PHC units are provided with adequate prophylactic health care service regarding NCDs. It is suggested that the risky behaviors of adults to health care units be questioned on the basis of their personal traits and counseling be provided regarding their existing risky behaviors.

Conflict of Interest

The Authors declare that there are no conflicts of interest.

References

1) WHO. Global Status Report on Noncommunicable Diseases 2010. Geneva, Switzerland: WHO Document Production Services, 2011; pp. vii-176.

2) WHO. Global Health Risks: Mortality and Burden of Disease Attributable to Selected Major Risks. Geneva, Switzerland, 2009; pp. 1-23.

3) MINISTRY OF HEALTH REFIK SAYDAM HYGIENE CENTER PRESIDENCY SCHOOL OF PUBLIC HEALTH. Turkey Burden of Disease Study 2004. Ankara, Turkey: SPH Publication No: SB-HM-2007/11; 2007: 4-40.

4) HENGSTLERA P, BATTEGAYA E, CORNUZB J, BUCHERC H, BATTEGAYA M. Evidence for prevention and screening: recommendations in adults. Swiss Med Wkly 2002; 132: 363-373.

5) TURKISH STATISTICAL INSTITUTE. Address Based Population Registration System Results 2011. Ankara, Turkey: Turkish Statistical Institute Printing Division, Publication Number 3649; 2012: 44.

6) MEYERS LS, GAMST G, AJ GUARINO. Applied Multivariate Research Design and Interpretation. London, U.K.: New Delhi, SAGE Publications Ltd, 2006; pp. 221-255.

7) WHO. Diet, Nutrition and the Prevention of Chronic Diseases. Geneva, Switzerland: WHO Technical Report Series, 916; 2003: 13-91.

8) KILIÇ M, ÇETINKAYA F. Prevalence of risky conditions and behaviors leading chronic diseases in health personnel in Yozgat provincial center. Turkiye Klinikleri J Med Sci 2012; 32: 1343-1353.

9) REPUBLIC OF TURKEY MINISTRY OF HEALTH. National Household Survey 2003 Basic Findings. Refik Saydam Hygiene Center Presidency School of Public Health, Ankara, Turkey: SPH Publication No: SB-HM-2007/10; 2006: 30-59.

10) THE PRIME MINISTRY, GENERAL DIRECTORATE OF FAMILY AND SOCIAL RESEARCH, TURKISH STATISTICAL INSTITUTE. [Family Structure Survey 2006]. Ankara, Turkey: Turkish Statistical Institute Printing Division, 2006; pp. 20-25.

11) TURKISH STATISTICAL INSTITUTE. Health Survey 2010. Ankara, Turkey: Turkish Statistical Institute Printing Division, Publication number: 3654; 2012: 5-52.

12) CHOWDHURY P, BALLUZ L, TOWN M, CHOWDHURY FM, BARTOLIS W, GARVIN W, AKCIN H, GREENLUND KJ, GILES W; CENTER FOR DISEASE CONTROL AND PREVENTION. Surveillance of certain health behaviors and conditions among states and selected local areas. Behavioral Risk Factor Surveillance System, United States, 2007. MMWR Surveill Summ 2010; 59(Suppl 1): S1-S220.

13) JUEL K, SØRENSEN J, BRØNNUM-HANSEN H. Risk factors and public health in Denmark. Scand J Public Health 2008; 36(Suppl 1): 1-227.

14) TOPUZOGLU A, HIDIROGLU S, ÖNSÜZ MF, POLAT G. [Missed opportunities for chronic diseases prevention in a primary health care center in Istanbul]. TAF Prev Med Bull 2011; 10: 665-674.

15) GÜNDOGDU C. The smoking behavior and affecting factors of physical education and sports teachers in Turkey. Health Med 2012; 6: 278-283.

16) THE MINISTRY OF HEALTH OF TURKEY. Global Adult Tobacco Survey Turkey Report – 2010. Ministry Of Health Primary Health Core General Director. Ankara, Turkey: Anil Matbaacilik Ltd Şti, 2010; pp. 15-80.

17) WHO. WHO Report on The Global Tobacco Epidemic, 2011: Warning about the dangers of tobacco. World Health Organization, Geneva, Switzerland, 2011; pp. 38-49.

18) KOÇ A. Social support from the families of female stroke survivors in Turkey. J Clin Anal Med 2014; 5: 480-485.

19) CHOWDHURY PP, BALLUZ L, MURPHY W, WEN XJ, ZHONG Y, OKORO C, BARTOLI B, GARVIN B, TOWN M, GILES W, MOKDAD A. Surveillance of certain health behaviors and conditions among states and selected local areas. Behavioral Risk Factor Surveillance System (BRFSS), United States, 2005. MMWR Surveill Summ2007; 56(Suppl 4): 1-S160.

20) KRUGER J, HAM SA, PROHASKA TR. Behavioral risk factors associated with overweight and obesity among older adults: the 2005 National Health Interview Survey. Preventing Chronic Disease 2009; 6: 1-17.

21) WHO. Fruit and Vegetable. World Health Survey, Turkey 2003. WHO Global Infobase IBRef: 101738; 2003. Available from: URL: https://apps.who.int/infobase/Indicators.aspx

22) ERDEM Y, ARICI M, ALTUN B, TURGAN C, SINDEL S, ERBAY B, DERICI U, KARATAN O, HASANOGLU E, CAGLAR S. The relationship between hypertension and salt intake in Turkish population: SALTurk study. Blood Press 2010; 19: 313-318.

23) WHO. Creating an enabling environment for population-based salt reduction strategies: report of a joint technical meeting held by WHO and the Food Standards Agency, United Kingdom. World Health Organization, Geneva, Switzerland, 2010; pp. 4-30.

24) ÇÖL M, ÖZDEMIR O, OCAKTAN ME. [Treatment-control situations and behavioral factors on hypertensives over 35 years of age at Park Health Center region]. Ankara Üniversitesi Tip Fakültesi Mecmuasi 2006; 59: 144-150.

25) AKBAY E, BUGDAYCI R, TEZCAN H, KONCA K, YAZAR A, PATA C. The prevalence of obesity in adult population in a city on the Mediterranean coast of Turkey. Turkish J Endocrinol Metab 2003; 1: 31-35.

26) FLEGAL KM, CARROLL MD, OGDEN CL, CURTIN LR. Prevalence and trends in obesity among US adults, 1999-2008. JAMA 2010; 303: 235-241.

27) JACOBS EJ, NEWTON CC, WANG Y, PATEL AV, MCCULLOUGH ML, CAMPBELL PT, THUN MJ, GAPSTUR SM. Waist circumference and all-cause mortality in a large US cohort. Arch Intern Med 2010; 170: 1293-1301.

28) LI C, FORD ES, MCGUIRE LC, MOKDAD AH. Increasing trends in waist circumference and abdominal obesity among U.S. adults. Obesity 2007; 15: 216-224.