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Screening Results of Non-communicable Diseases in Adults and Elderly People Living in the Rural Area: A Cross-sectional Descriptive Study

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ABSTRACT

Objective: The aim of this study is to determine the prevalence, risk, and cancer screening results of the non-communicable diseases (NCDs) in the province of Antalya, Turkey.

Materials and Methods: The sample in this cross-sectional descriptive study included 441 volunteers (universe 3841) aged >40 years living in four rural areas in Antalya. The questionnaire used in the study was divided into three parts: descriptive characteristics, Finnish Diabetes Risk Score (FINDRISK), depression risk questionnaire, and cancer screening sections.

Results: In total, 91.6% of the participants were aged ≥45 years, and at least one in 50.3% had a chronic disease. According to FINDRISK, 23.8% were in high, and 7.9% were in a very high risk group, 34.5% were slightly overweight, 56.2% were obese, and 26.7% had metabolic syndrome (MS). In total, 22.2% of the individuals were at a risk of depression. In cancer screenings, 32.1% of the women underwent mammography in the past 2 years, 33.6% underwent breast self-examination, and 60.3% underwent cervical cancer screening in the last 5 years. It was determined that 17.2% of participants underwent immunochemical fecal occult blood test.

Conclusion: It was observed that approximately one-third of the participants are under risk in term of hypertension and diabetes mellitus. Compared with previous studies, screening rates have increased in recent years, but they are not at the desired level. There is a need to promote encouraging practices for individuals living in rural areas aimed at prevention of NCDs, screening, and effective management of these diseases.

Keywords: Non-communicable diseases, risk factors, screening, rural area, Turkey

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INTRODUCTION

Non-communicable diseases (NCDs) are the main cause of death worldwide. NCDs, particularly cardiovascular diseases, cancer, chronic respiratory diseases, and diabetes, lead to 41 million deaths annually, and this accounts for 71% of all the deaths worldwide. The majority of NCD-associated deaths occur in individuals aged >40 years and >85% of these deaths occur in lower- and middle-income countries. The increase in early deaths owing to NCDs imposes a heavy burden on the health system and adversely affects economic development and welfare (1). The NCD-associated death rates in Turkey were reported to be similar to the rates in other countries of the World Health Organization (WHO) European Region, and 80.9% of all deaths are caused by NCDs (2). According to the study on the prevalence of NCD risk factors conducted in Turkey, it was determined that approximately one-fourth of the population had hypertension, 13.6% never had their blood pressure measured to date, and 24.3% of those who had been previously diagnosed with hypertension received no treatment (1–3).

The rate of new cancer cases diagnosed in 2018 was 26% in both genders, the rate of mammography screening in women aged >40 years was 57.4%, the rate of cervical cancer screening in women aged >30 years was 54.2%, and the rate of undergoing immunochemical fecal occult blood test (FOBT) in both genders in the 50–70 years age group was 25.5% (4).

In the individuals living in rural areas of Turkey, the rate of engaging in unhealthy lifestyle behaviors and not undergoing health screening are higher than in those living in urban areas. These inequalities are becoming even more widespread among groups such as poor and disabled people living in the rural areas who may have difficulty in accessing health access (5, 6). Through health screenings, diseases can be diagnosed and treated at an early stage, especially in individuals in rural areas at risk, and morbidity and mortality rates associated with NCDs can be reduced (5). The difficulties preventing individuals in rural areas from participating in NCD screenings may include insufficient health care personnel, inadequate equipment, insufficient transportation facilities, irregular visits to health care centers, lower perception of general health status than urban areas, and a lack of awareness and insufficient knowledge regarding early diagnosis and screening tests and the institutions patients should visit for treatment (7, 8). In the studies conducted in Turkey, it was reported that the rates of

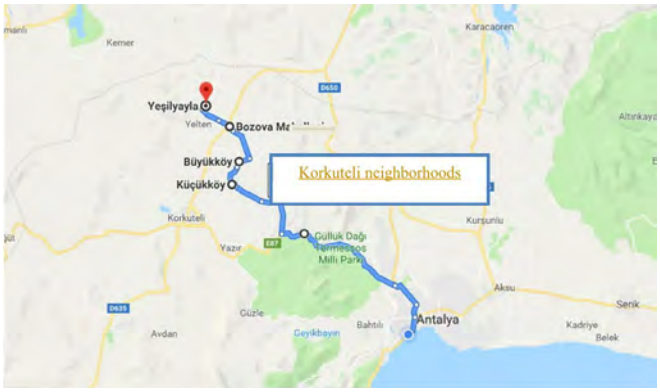

Figure 1. Screened neighborhoods

health screening participation are extremely low, and these rates can improve if health screening services become accessible to all individuals (9, 10).

Screenings are performed for the early detection of NCDs, identification of population at risk, detection of evidence-based data, providing guidance to health care systems, and early control of modifiable risk factors. Through screenings, which are an important part of public health policies, savings on health expenditures can be achieved by planning health care services and reducing social and family burden through early protection (11, 12). Early detection of these diseases is extremely important for the prevention of the economic burden due to costly treatments of NCD complications and comorbidities (13).

Conducting studies on screenings recommended for hypertension, diabetes, obesity, depression, and cancer in adult and elderly individuals living in rural areas may constitute a basic data source for screening programs to be conducted in later years. The aim of this study is to determine the prevalence, risk, and cancer screening results of NCDs in adults and the elderly in rural areas in the Antalya province.

MATERIALS and METHODS

Design and Setting

The data for this cross-sectional descriptive study were collected between 6 November and 29 November 2018. Four rural areas (Bozova, Yeşilyayla, Küçükköy, and Büyükköy) of the Korkuteli district were included in the study; these areas were reported to have been reached less by health care services of the Korkuteli District Health Directorate under the Antalya Provincial Health Directorate (Fig. 1). The universe of the study comprised 3841 individuals aged ≥40 years and registered in these neighborhoods. For determining the sample size of the study, "sample size determination formula when the number of individuals in the universe is known" was used (14). According to this formula in calculating the sample size, the reference value (21.0%) was determined as the diabetes prevalence, which is the highest value from NCDs in the study conducted by Oguz et al. (15), and the sample size was calculated as 256. In this study, 441 individuals volunteered to participate in the screening, and these individuals constituted the sample.

Table 1. Diabetes Diagnostic Criteria

Fasting glucose
Normal glucose tolerance (<100 mg/dl)
IFG (101–125 mg/dl)
Diabetes (≥126 mg/dl)
Postprandial glucose
Normal glucose tolerance (<140 mg/dl)
IGT (141–199 mg/dl)
Diabetes ≥200 mg/dl

IFG: Isolated impaired fasting glucose; IGT: Isolated impaired glucose tolerance

Table 2. FINDRISK risk score

Total score	Degree of risk	10-year risk
<7	Low	%1 (1/100)
7–11	Slightly	%4 (1/25)
12–14	Moderate	%16 (1/6)
15–20	High	%33 (1/3)
>20	Very High	%50 (1/2)

FINDRISK: Finnish Diabetes Risk Score

Data Collection Tools

The data collection form included descriptive characteristics (location, gender, height, weight, waist circumference, body mass index [BMI], blood pressure measurement, fasting and postprandial blood glucose, presence of a chronic disease, and smoking), the Finnish Diabetes Risk Score (FINDRISK), depression risk questionnaire, and cancer screening sections.

Systolic and diastolic blood pressures were measured using a stethoscope and sphygmomanometer (Erka Perfect Aneroid, Germany). In obesity screening, body weight, height, and waist and hip circumference of the individual were measured. In diabetes screening, following fasting for 8–10 hours on the previous night, fasting glucose, 2 hours after the first bite of the meal, postprandial glucose, and random glucose values were measured from the capillary (fingertip) using the Accu-Chek glucometer. Based on the results, individuals were referred to health care institutions. Isolated impaired fasting glucose (IFG) and isolated impaired glucose tolerance (IGT) for diabetes were based on the reference values of the Turkey Endocrinology and Metabolism Society (TEMS) (16) (Table 1).

The FINDRISK form was used to estimate the level of diabetes risk. FINDRISC is recognized as a practical tool for use in primary health care systems throughout the European population. The FINDRISK questionnaire, which is also widely used in our country and is recommended by TEMS, is reported to be useful to estimate Type 2 diabetes risk at an early stage (16). In this questionnaire, age, BMI, waist circumference, exercise status, fruit and vegetable consumption, drug use, presence of hypertension in case of high blood pressure, presence of a high blood glucose level, and the presence of diabetes in first- and second-degree relatives were questioned. Table 2 shows the risk score and degree according to FINDRISK.

The TEMS diagnosis criteria were considered in MS diagnosis. Those with a diagnosis of diabetes mellitus or IGT, hypertension or high blood pressure values (systolic blood pressure >130 or diastolic blood pressure >85 mmHg), and abdominal obesity (BMI >30 kg/mI, or waist circumference >102 cm in men and >88 cm in women) were considered (16). Individuals who fit the criteria of MS were referred to FHC or a secondary health care institution.

In the screening for depression risk, individuals were asked questions that inquired the risk of depression used in the Family Medicine (17). These questions were about "the situation of individuals feeling depressed or hopeless almost every day in the past 2 weeks" and "the presence of complaints such as loss of interest or inability to enjoy life." Those who answered yes to both questions were considered to be at a risk of depression. In the cancer screening, women were asked about undergoing a mammography in the past 2 years and undergoing breast self-examination (BSE), Pap smear, and HPV-DNA test in the past 5 years; men and women were asked about undergoing colorectal cancer screening. During data collection, cervix screening was performed in women (aged 40–65 years) and FOBT in women and men (aged ≥50 years) in the mobile screening vehicle sent from the Cancer Early Diagnosis and Education Centers (CEDECs).

Data Collection

Posters providing information about screening for individuals aged >40 years in rural areas were sent to the village headmen 1 week in advance. Through posters, individuals were instructed to fast for 8 h before the blood glucose measurement. Data collection and measurements (BMI, capillary blood glucose, and blood pressure) were conducted by researchers at the day and time indicated in the posters; cervical cancer screening and FOBT were conducted by medics in the mobile screening vehicle. Before the blood pressure measurement and between two blood pressure measurements, individuals were allowed to rest for 10 min, obese individuals were referred to dieticians, and individuals with above-normal blood glucose levels were referred to FHC during screenings.

In the posters, it was stated that "no vaginal medication, suppositories, and vaginal douches should be used 3 days before the screening, and abstinence should be practiced for 3 days" for cervical cancer screenings. The forms were filled by researchers using face-to-face interview method. The results of the Pap smear and HPV tests were obtained from the Antalya Provincial Health Directorate by telephone after 2 weeks, and women who tested positive were contacted via phone and referred to a gynecologist, and individuals with a positive FOBT result were referred to a general surgeon.

Ethical Issues

Permissions were obtained from the Clinical Research Ethics Committee of the Akdeniz University Faculty of Medicine (Code: 5/12/2018-865) to conduct the study and from the Antalya Provincial Health Directorate to conduct the study in the villages. In addition, informed consent was obtained from individuals.

Data Analysis

The study data were analyzed using the licensed SPSS (v. 23.0) statistical program. Percentages and counts were used in determining diabetes, obesity, and depression risks of individuals and their participation in cancer screening.

Table 3. Socio-demographic characteristics of participants (n=441)

Characteristics	n	%
Age		
<45	37	8.4
45–54	124	28.1
55–64	153	34.7
>64	127	28.8
Gender		
Women	262	59.4
Male	179	40.6
Blood pressure		
First and second measurement average		
≤139 mmHg	284	64.4
≥140 mmHg	157	35.6
≤89 mmHg	304	68.9
≥90 mmHg	137	31.1
Presence of chronic disease		
Yes	222	50.3
No	219	49.7
Diagnosed diseases by the doctor according to participants' own statement (n=222)[a]		
Hypertension	106	47.75
Diabetes	72	32.43
Coronary heart disease artery	39	17.57
Artery disease	–	–
Stroke	1	0.45
Asthma	36	16.22
Chronic obstructive pulmonary disease	1	0.45
Goiter	20	9.01
Cancer	7	3.15
Other	27	12.16
Smoking		
Yes	46	10.4
No	395	89.6

a: Percentages were calculated on the number of patients with chronic disease (n=222)

RESULTS

It was found that 91.6% of the participants were in the age range ≥45 years, and 59.4% were female. According to the mean value of two blood pressure measurements, which were measured at 10 min intervals, it was found that 35.6% of patients had a systolic blood pressure >140 mm/Hg, and 31.1% had a diastolic blood pressure >90 mm/Hg (Table 3). It was determined that 50.3% of the participants had at least one chronic disease, 47.8% had hypertension, 32.4% had diabetes, 18% had coronary heart disease, and 90% were non-smokers (Table 3).

In the FINDRISC, 23.8% of the individuals were in the high risk

Table 4. Screening results of non-communicable diseases of participants

Screening	n	%
Risk screening for diabetes with FINDRISK in asymptomatic people (n=369)[a]		
Low -%1	49	13.3
Slightly -%4	128	34.7
Moderate -%16	75	20.3
High -%33	88	23.8
Very high -%50	29	7.9
Diabetes risk classification according to capillary blood sample[b]		
Fasting glucose (n=239)		
Normal glucose tolerance (<100 mg/dl)	168	70.3
Impaired fasting glucose (101–125 mg/dl)	42	17.6
Diabetes (≥126 mg/dl)	29	12.1
Participants did not participate in fasting or postprandial blood glucose test (n=10)		
Postprandial glucose (n=192)		
Normal glucose tolerance (<140 mg/dl)	154	80.2
Isolated impaired glucose tolerance (141–199 mg/dl)	23	12.0
Diabetes ≥200 mg/dl	15	7.8
MS assessment (n=266)		
Yes	71	26.7
No	195	73.3
Obesity screening BMI[c] (n=441)		
Normal (18.50–24.99)	41	9.3
Lightweight (25.00–29.99)	152	34.5
Obese (>30.00)	248	56.2
Depression risk (n=441)		
Yes	98	22.2
No	343	77.8
Breast cancer screening (n=261)		
Mammography		
Yes	84	32.1
No	178	67.9
BSE		
Regularly done (monthly)	88	33.6
Never or irregularly done	174	66.4
Cervical cancer screening (n=189)[d,e]		
Pap smear/HPV test in the last 5 years		
Yes	114	60.3
No	75	39.7
Colorectal cancer screening (n=395)[f,g]		
FOBT in the last 2 years		
Yes	68	17.2
No	327	82.8

a: 72 participants with diabetes were excluded; b: Diabetes risk classification according to the capillary blood sample; c: BMI (based on WHO reference values); d: Out of 75 women who had not undergone cervical cancer screening in the past 5 years, 51 volunteered to undergo the Pap smear/HPV test in the mobile vehicle; e: 73 women aged >65 years were excluded; f: Out of 327 individuals who had not undergone colorectal cancer screening in the past 2 years, 228 underwent the FOBT test during data collection; g: FOBT was not applied to 46 participants because they were aged <50 years. The percentage of FOBT was calculated on 395 participants; FINDRISK: Finnish Diabetes Risk Score; MS: Metabolic syndrome; BMI: Body mass index; BSE: Breast self-examination; FOBT: Fecal occult blood test;

group (15–19 points), and 7.9% were in the very high risk group (>20 points). Regarding diabetes evaluation, fasting glucose and random measurements revealed that 12.1% of individuals had diabetes, and 17.6% had isolated IFG, whereas postprandial blood glucose measurements revealed that 7.8% had apparent diabetes, and 12.0 had isolated IGT values.

The prevalence of MS in this study, in which diabetes, abdominal obesity (BMI of 30 kg/mI or waist circumference of 102 cm in men and 88 cm in women), and hypertension (systolic blood pressure of 130 or diastolic blood pressure of 85 mmHg) were evaluated according to MS diagnostic criteria suggested by TEMS and MS Working Group (18), was found to be 26.7%. Obesity screening revealed that 34.5% of the individuals were slightly overweight, and 56.2% were obese (Table 4). In the depression risk screening, it was found that 22.2% of the individuals felt depressed and did not enjoy life (Table 4).

It was determined that 33.6% of the female participants regularly underwent BSE every month, 32.1% underwent mammography in the past 2 years, 60.3% underwent cervical cancer screening, and 17.2% underwent FOBT in the past 2 years. During data collection, 51 women underwent cervical cancer screening in the mobile screening vehicle, and the results of three individuals were found to be positive. For colorectal cancer screening (CRS), 228 individuals underwent FOBT, and the results of 12 individuals were positive (Table 4).

DISCUSSION

In this study, when NCDs screening results of the adult and the old individuals in rural areas in Antalya were evaluated in general, it was found that the prevalence of hypertension and coronary heart disease were consisted with the averages throughout Turkey, but higher in comparison with those of international averages. It was also found that the smoking rate was lower than the rates in literature both in Turkey and the world, and the prevalence rates of diabetes and obesity were higher than the rates in literature both in Turkey and the world. In addition, it was founded that the cancer screening rates were higher when compared with the studies done in Turkey in the past, but lower in comparison with those of developed countries (15, 19–21).

According to the mean value of blood pressure measurements of the participants, it was determined that one-third of the participants (35.6%) had a systolic blood pressure >140 mm/Hg and a diastolic blood pressure >90 mm/Hg (Table 3). In this study, it was determined that 48% of the participants had hypertension according to their own statements. Similarly, in a study conducted in rural areas in Turkey, this rate was 46.6% (15). In a study conducted in rural areas in Myanmar (21), the prevalence of hypertension was found to be 39.7%. These research data on hypertension prevalence in this study were found to be similar or higher than those reported in other studies, and it is a major problem threatening health in rural areas.

In this study, it was determined that 55.1% of the participants had at least one chronic disease, and 18% had coronary heart disease (Table 3). Similarly, in a study conducted across Turkey, the prevalence of coronary heart disease was found to be 13.9% in men and 12.1% in women (19). In a study conducted in rural areas in the United States, the prevalence of presence of one or more chronic diseases was found to be 35.7% (22). In a study conducted in China, it was found that the prevalence of chronic diseases was higher in rural areas than in urban areas. The prevalence of circulatory system diseases was found to be 25.6% in rural areas and 21.7% in urban areas (23). In the study by Htet et al., it was determined that the prevalence of behavioral risk factors in individuals living in rural areas for NCD was higher than that in those living in urban areas (21). In this study, because more than half of the participants had a chronic disease, health personnel working at FHCs in rural areas have important responsibility. It is extremely important for health care personnel to diagnose such patients at an early stage, to guide them, and to administer treatment and conduct regular follow-ups.

In this study, the rate of smoking was 10% (Table 3), whereas that of tobacco and tobacco products use in Turkey was 26.5% (20). In Myanmar, the prevalence of smoking in rural areas (21) was 27.0%; in a study conducted in rural areas in the United States, the smoking rate was found to be 36% (24). According to the CDC data, 24.3% of the individuals in the United States were found to be smokers (22). The rate of smoking in this study was found to be lower than that of tobacco use in Turkey and worldwide. However, tobacco use should not be overlooked in rural areas because of the low socioeconomic status, cultural norms, less utilization of tobacco control initiatives, and less access to health services.

In this study, it was determined that the prevalence of diabetes was 32.43%; FINDRISC revealed that 23.8% of individuals were at a high risk, and 7.9% were at a very high risk (Table 4). In a study conducted in Turkey, it was determined that the prevalence of diabetes was 13.7% in 2008 and increased to 21% in 2015 (15). In the study conducted in Myanmar (21), the prevalence of diabetes was found to be 9.2%. In a study conducted by Omech et al. (25) using FINDRISC, it was found that 16.5% of individuals were at a high risk, and 23.5% were at a very high risk. In this study, diabetes prevalence in rural areas was higher than diabetes risk in Turkey and worldwide. Among people living in rural areas, awareness regarding diabetes should be increased by primary health care institutions, those with a diagnosis of diabetes should effectively manage their disease, and those at a risk should be encouraged to develop health-promoting behaviors.

In this study, when diabetes, abdominal obesity, and hypertension were evaluated according to the MS diagnostic criteria suggested by the TEMD and MS Working Group (16–18), the prevalence of MS was 26.7% (Table 4). In the study conducted in rural areas, it was found that 34.6% of the participants had MS according to the ATP III criteria (15).

Obesity screening revealed that 34.5% of the individuals were mildly overweight, and 56.2% were obese (Table 4). Similarly, in the study conducted in Turkey, 52.8% of the participants were obese (15). According to a study conducted in rural areas, 45% of individuals were determined to be obese (24). In the America, 33.4% of adult individuals were found to have a BMI >30, and 5.6% had a BMI >40 (22). The prevalence of obesity in Turkey is extremely high in rural and urban areas. Awareness of community about obesity, healthy diet, and physical activity should be increased by primary health care institutes using different health education methods.

In this study, it was determined that 22.2% of individuals felt depressed and did not enjoy life (Table 4). The prevalence of depression in Turkey was reported to be 4.4%, and this ratio was observed to be approximately 8% in adult women and 5.5% in men (26). In a meta-analysis, it was found that the depression rate in developed countries was higher in urban areas than in rural areas and that there was no difference between rural and urban areas in developing countries (27).

In this study, it was determined that the rate of women undergoing mammography in the past 2 years was 32.1%, and the rate of regularly undergoing BSE every month was 33.5% (Table 4). In Turkey, the rate of undergoing mammography was determined to be 16.1% in 2016, and the rate of undergoing BSE was 19.7%. In this study, both the rate of undergoing mammography and that of undergoing BSE were slightly higher than that reported in the data of the Ministry of Health (20). In a study conducted in rural areas in India, breast cancer awareness and the rate of undergoing BSE were extremely low (28).

In this study, it was found that more than half of the women (60.3%) underwent cervical cancer screening (Table 4). Cervical cancer ranks ninth among the most common cancers in women in Turkey, and the screening rate is 25.6% based on the data of the Ministry of Health (20). In a different study conducted in rural areas, the cervical cancer screening rate was found to be 50% (29). In this study, the reason why the ratio of mammography and cervical cancer screening were higher than the Turkish average was that the Antalya Province Health Directorate have conducted regular screening in women living in rural areas since 2015. This screening system was performed by transporting women to CEDECs in Antalya city center by the public buses provided by municipality. In addition, the increased rate of cancer screening in Turkey in recent years can be explained by screening being free of charge and readily available mammography services provided by CEDECs.

In this study, the rate of FOBT in the last 2 years was 17.2% (Table 4). In a study conducted with individuals working in agriculture, it was 7% (9). In a study conducted in the United States, the rate of individuals undergoing FOBT in rural areas was 22% (30). According to the results of our study, there is a substantial need of raising awareness regarding colorectal cancer screening in Turkey.

CONCLUSION

The prevalence of NCDs in rural areas in Antalya was found to be high, and the NCDs with the highest rate are hypertension and diabetes. The NCD screening rates have increased in recent years compared with those reported in studies conducted in previous years, but they have not reached the desired level. Health care workers in primary health care institutions can play an important role in reducing the NCD risks by improving healthy lifestyle behaviors (such as nutrition, physical activity, and quitting smoking) of individuals in the rural area. In addition, there is also a need to establish a stricter follow-up system to effectively manage NCDs in individuals living in rural areas. To increase early screening rates in rural areas, it is important to promote application to healthy living centers located in cities and to ensure the sustainability of health screening.

Limitations

The most important limitation of this study is that it is a cross-sectional descriptive study, and participants living in some rural areas of Antalya were selected using a probable sampling method.

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Ethics Committee Approval: Permissions were obtained from the Clinical Research Ethics Committee of the Akdeniz University Faculty of Medicine (date: 05.12.2018, number: 865) to conduct the study and from the Antalya Provincial Health Directorate to conduct the study in the villages.

Informed Consent: Written informed consent was obtained from patients who participated in this study.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept – AT, LM; Design – AT, LM; Supervision – AT, LM; Resource – AT, LM; Materials – AT, LM; Data Collection and/or Processing – AT, LM; Analysis and/or Interpretation – AT, LM; Literature Search – AT, LM; Writing – AT, LM; Critical Reviews – AT, LM.

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