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Determining type 2 diabetes risk factors for the adults: A community based study from Turkey

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ABSTRACT

Aims: This study aimed to determine risk factors for type 2 diabetes among adults who were not diagnosed with diabetes.

Methods: Adults were included in this study within the public activities performed on World Diabetes Day (n = 1872). Data were collected using the FINDRISC questionnaire and a short questionnaire.

Results: Participants' mean age was 39.35 ± 10.40 . The mean FINDRISC score was 7.46 ± 4.62 , women's mean score was higher than that for men. The FINDRISC score indicates that 7.4% of the participants were in the highrisk group. Among participants, BMI value of 65.1% was 25 kg/m^2 and higher, waist circumference of 58% was over the threshold value; and 50.7% did not engage in sufficient physical activity. Of the participants, 9.5% had a history of high blood glucose, families of 38.9% had a history of diabetes. The mean FINDRISC score was in the slightly high category, 121 participants were found likely to be diagnosed with diabetes within ten years if no action was taken.

Conclusions: It is recommended the risk screening studies to be conducted and the FINDRISC tool to be used in Turkey, where diabetes prevalence is increasing rapidly, to determine diabetes risks in the early period and to raise social awareness for diabetes.

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1. Introduction

Type 2 diabetes (T2D) is a significant health problem affecting millions of people worldwide and is increasing more rapidly than expected. The International Diabetes Federation (IDF)

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reports that 424.9 million people were diabetes patients at the end of 2017, and that this number will reach 628.6 million in 2045. In addition, 50% of the people with diabetes are not aware of their disease, and three-quarters of them lived in the countries in low to moderate income group [1]. The study for the Diabetes Epidemiology in Turkey (TURDEP-2) suggests that 45% of diabetes patients in Turkey are not aware of their disease, and that diabetes prevalence is 13.7%. The same study indicates that diabetes increased by 90% between 1998 and 2010 in Turkey; impaired glucose tolerance (IGT) increased by 106%; and obesity, one of the major risk factors for diabetes, increased by 40% [2]. Turkey has the highest age-adjusted comparative prevalence and the third-highest number of people with diabetes in the Europe Region, after Germany and the Russian Federation [1]. In addition to diagnosed diabetes patients, the increase in the number of those with prediabetes and low level of awareness regarding diabetes suggests that this problem will grow.

T2D is a disease that hides itself and continues existing for many years without displaying any symptoms. Based on the reports, T2D starts before the disease shows itself: the disease emerges earlier if the risk factors for the vulnerable people cannot be determined and thus managed, and complications may occur in the long period during which no diagnosis is determined [3,4]. It is possible to detect the disease in this no-symptom period and to prevent or delay the disease by managing the risk factors [3,5-7].

The benefit of diabetes screening for early diagnosis and cost-effectivity is controversial issue, but it has been implied that screening are important for raising awareness [8-10]. No global screening recommendation exists for T2D. It is suggested that every country should make effort to detect diabetes, considering their own health-related indicators, in each step of their health services, and they should adopt a forward-thinking attitude. The International Diabetes Federation recommends that people at high risk is determined first using the risk questionnaire tools with a two-step approach, and blood glucose level of these people is measured later [3]. Ideally, screening should not include blood test because one of its purposes is to reduce the number of persons needing a laboratory test. Screening questionnaires are becoming more widely used because they include the main risk factors and can be easily conducted by trained personnel [4]. It is suggested that use of risk determination tools in social studies is useful both for determining persons facing risks and raising awareness about the modifiable risk factors [10-15]. Suggestions of the international health authorities indicate that all adults should be evaluated for T2D risks based on their demographic and clinical characteristics [16,17].

This study aimed to determine T2D risk factors among the people who have not been diagnosed with diabetes.

2. Method

2.1. Study design, sample and procedures

This community based and descriptive study was conducted in two largest cities of Turkey, İstanbul and Ankara, as a part

of the public activities performed within the World Diabetes Day. No sampling was selected, and 2034 people who were over 18 years old and not diagnosed with diabetes agreed to participate. 162 people whose data were missing in the data collection tools were excluded; the data of 1872 people was analyzed with. The data were collected using the Finnish Diabetes Risk Score (FINDRISC) questionnaire and a short questionnaire prepared by the researchers consisted of nine questions regarding gender, marital status, educational status, income level, smoking habit, height, weight, waist circumference. Data were collected via pencil-and-paper surveys. Eligible participants were approached by the investigators while they were waiting to join the World Diabetes Day activities and they were invited to partake after the study was explained to them. Once they agreed to participate, they were asked to complete the survey. They were encouraged to complete the questionnaire unaided and in private. The administration of the data collection tools took an average of 10-12 min.

FINDRISC is a tool used by the International Diabetes Federation for population-based screenings. It was developed using a large random population sample of individuals taking no antidiabetic medication at baseline and who were followed for 10 years. It requires age, body mass index (BMI), waist circumference, history of antihypertensive drug treatment and high blood glucose, physical activity, and daily consumption of fruits, berries, or vegetables to calculate risk. FINDRISC can be used as a simple, fast, and noninvasive screening tool to identify individuals at high risk for diabetes and pre-diabetes [4,13,18,19]. The FINDRISC questionnaire, which is scored on a point range between 0 and 26, employs eight critical questions to reveal the diabetes risk for the individuals who are at risk for diabetes within in ten years: (<7 points [low-1%]; 7-11 [slightly elevated-4%]; 12-14 [moderate-16%]; 15-20 [high-33%]; >20 [very high-50%]).

Participants' blood glucose, height and weight were measured. Their weights were measured on foot, without any shoes and wearing lightweight clothes, using a highly sensitive digital scale that can measure as low as 100 grams; their height was measured with a sensitive tape measure that was hung on the wall as participants leaned their heads against the wall, stood straight wearing no shoes, with their feet adjacent at their heels. Following the height and weight measurements, participants' waist circumference was measured using a tape measure. Their BMI value was calculated using the height and weight values. Although blood glucose measurement was not recommended during the screening, it was still performed to increase the participation rate because the data were collected publicly. Random capillary blood glucose (RCBG) (at any time of the day, without asking whether participants were hungry) was measured using a glucometer with an international-quality document. A full-capillary blood sample was taken from the ring finger of the left hand or the middle finger; the threshold value was accepted as ≥ 140 mg/dl [10]. Those persons with a FINDRISC score of 12 or over and those with RCBG ≥ 140 mg/dl were directed to a health institution for further checks. After evaluation was completed all participants were informed about their risk level and a brochure to increase diabetes awareness was given.

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