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Research

Test-Retest Reliability and External Validity of Canadian Diabetes Risk Questionnaire - Turkish

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Abstract

Objectives: The aim of the study was to examine the test-retest reliability and external validity of the Canadian Diabetes Risk Questionnaire (CanRisk).
Materials and Methods: Individuals over 40 years of age without any disease were included in the study. Participants were administered the CanRisk, Nottingham Health Profile (NHP), and Visual Analog Scale (VAS). CanRisk test-retest validity was calculated with the interclass correlation coefficient (ICC), and external validity was calculated with the Pearson correlation coefficient.
Results: The study included 1349 participants, 549 men and 755 women (mean age 50.03 ± 8.05 years). CanRisk test-retest validity was found to be excellent (0.99). Its external validity was evaluated by examining its correlation with NHP, and it was found that there was a statistically significant, positive weak correlation ($p<0.05$, $r= 0.23$).
Conclusion: CanRisk -TR was found to be a reliable and valid questionnaire to predict diabetes risk.

Keywords: *Diabetes Mellitus, Reliability, Validity, Health Risk Assessment*

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Introduction

Diabetes Mellitus (DM) is a chronic, broad-spectrum metabolic disease characterized by high blood sugar due to partial or absolute deficiency of insulin hormone or peripheral tissue resistance to the action of insulin hormone. Risk for disease ocular, renal, neurological, cardiovascular, peripheral vascular problems by increasing the risk of premature death and medical expenses due to these conditions; requires extensive medical care as it reduces employment, productivity and quality of life (American Diabetes Association, 2021; Dall et al., 2014; Salman et al., 2020).

According to the data of the Turkish Diabetes, Hypertension, Obesity and Endocrine Diseases Prevalence Study-I (TURDEP-I), which was conducted with approximately 25000 people in 540 centers in Turkey, the frequency of type 2 DM is found as 7.2% (Satman et al., 2002). In Turkey Diabetes, Hypertension, Obesity and Endocrine Diseases Prevalence Study-II (TURDEP-II) conducted in 2010 in the same centers using the same method as the TURDEP-I study, the frequency of type 2 DM has nearly doubled in 12 years and was found as 13.7% (Satman et al., 2013). Turkey data of the Prospective Urban Rural Epidemiology (PURE) research was published in 2018; The prevalence of diabetes, which was 13.7% in 2010, increased to 21% in 2015 (Oğuz, 2018).

The increasing prevalence of diabetes places a heavy burden on the healthcare system with high morbidity and mortality rates (International Diabetes Federation, 2015). In order to alleviate the effects of diabetes on the individual and society, individuals at risk for diabetes should be identified and diabetes should be prevented or delayed with interventions. For this reason, there is a need for scales aiming to detect high-risk individuals in terms of diabetes and to prevent the development of diabetes by following these individuals closely in Turkey as well as in the rest of the world.

As far as we know, Turkey only has one diabetes risk calculator in use. One of the first diabetes risk calculators used for population-based diabetes screening was the Finnish Diabetes Risk Score (FINDRISC), which was created in 2001 and has a moderate level of area under the curve (AUC) 0.85.(Lindstrom & Tuomilehto, 2003). The FINDRISC has been translated and analyzed in Turkey, where it was shown to have moderate accuracy for the urban Turkish population, with an AUC of 0.80 (95% CI.699,.804). (Demirağ, 2016).

The Canadian Diabetes Risk Questionnaire (CanRisk) (Robinson et al., 2011) is a recently developed risk calculator that was modified from the FINDRISC to identify risk

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variations in Canada based on racial, societal, and environmental factors. Age, gender, education level, body mass index (BMI), waist circumference, physical activity, consumption of fruits and vegetables, history of hypertension, use of antihypertensive medications, history of high blood sugar, family history of diabetes, ethnicity, and history of macrosomia (birth weight over 4.0 kg) are among the 13 factors that make up the CanRisk. The CanRisk was translated and validated in Chinese (Guo et al., 2018), Arabic (Alghwiri et al., 2014), Brazilian (Lourenço et al., 2021). However, as well as our knowledge the CanRisk has not yet been translated and used in Turkey. Empirical review is required to ensure psychometric soundness when instruments created in one cultural context are translated for use in another. Consequently, the goal of the current study was to evaluate CanRisk's psychometric characteristics.

Material and Methods

This study was conducted in two stages to evaluate CanRisk's psychometric qualities and cross-cultural adaption. Written consent was obtained from Canadian Public Health Agency to conduct a validity and reliability study. All participants signed the informed consent form after the study received approval from the Non-Conventional Interventions Ethical Board.

Part I: Translation and Cross-cultural Adaptation

This study adhered to the requirements for translation and cross-cultural adaptation studies provided by Beaton (Beaton et al., 2000). First, three authors independently translated the CanRisk into Turkish. The authors decided on the finest Turkish translation following this initial translation procedure, and then they forwarded it to an English translator who created a back translation. All authors attended a meeting of an expert panel to discuss the finished product. The authors talked about and considered possible revisions to the translated introduction and items.

Part II: The Psychometric Properties of CanRisk

Participants

The study included participants who were relatives / caregivers of clients of Hacettepe University Occupational Therapy department. Participants who were older than 40 years (lower limit of age risk for Type II diabetes) were included to the study between November 2021 – May 2022. Additionally, participants were excluded in presence of any other

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neurologic, systemic or orthopedic diagnosis.

Instruments

Socio-Demographic information was gathered from each participant including age, gender and employment status.

The Canadian Diabetes Risk Questionnaire (CanRisk) is a risk calculator to determine the risks related to lifestyle, ethnicity, and environmental factors in Canada. The CanRisk consists of 13 items including age, gender, body mass index (BMI), waist circumference, physical activity, fruit/vegetable consumption, history of hypertension, usage of antihypertensive medications, history of high blood glucose, family history of diabetes, ethnicity, education level, and history of macrosomia. The CanRisk is an updated version of the Finnish diabetes risk questionnaire, where CanRisk is more robust to present diverse risks of diabetes (Štiglic et al., 2016). Each item in The CanRisk has different scoring, however, a high score in total score is related to high risk of type II diabetes (0-21: low risk, 22- 32: moderate risk, 33 and over: high risk).

The Nottingham Health Profile (NHP) is a patient-reported outcome measure that evaluates the perceived health of the examinee (Hunt et al., 1981). The NHP consists of 38 items with a Yes/No format and presents outcomes in six different dimensions: energy, pain, emotional reactions, sleep, social isolation and physical mobility. The NHP can be scored between 0 to 600, which higher scores indicate lower perceived health (Kücükdeveci et al., 2000).

Visual Analog Scale (VAS) was used to evaluate the knowledge about prevention methods for diabetes, knowledge about symptoms of diabetes and perceived physical activity level in the last 6 months. A 10 cm long line was given to the examinee to pick their rates on the questions where 10 indicated that the examinee stated that he/she had sufficient knowledge. Apart from VAS, one additional multiple-choice question was asked to the participants, in which *'the most efficient way to prevent diabetes'* was asked. The multiple-choice answers were nutrition, physical activity, drug treatments, and avoiding stress; where the examinee can choose more than one option.

Both NHP and VAS were added to test the convergent validity of the CanRisk-Türk.

Statistical Analysis

The demographic information and survey responses of the participants were described using a descriptive analysis. Means and standard deviations were used to represent numerical

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values, and frequencies were used to represent categorical data.

Test-retest reliability of the CanRisk-Türk was investigated with Interclass Correlation Coefficients. A retest of the CanRisk was applied to 307 participants, one week after the first evaluation.

The convergent validity of CanRisk was evaluated using the Pearson correlation coefficient. A correlation is considered to be "strong" if the Pearson correlation coefficient is greater than0.7, "moderate" if it is between 0.31 and 0.69, and "weak" if it is less than 0.3 (Akoglu, 2018).

Results

Part I: Translation and Cross-cultural Adaptation

There were no corrections to the translated CanRisk and the questionnaire is presented as in the first translation (see supplementary document at the end of the article, supp.1)

Part II: The Psychometric Properties of CanRisk

A total of 1349 participants were included in the study with a mean age of 50.03 ± 8.05 (min 40, max 70) years. The gender distribution of the participants was 594 male (44%) and 755 females (56%). Majority of the participants were unemployed mothers (32.5%, n = 439), followed by government officials (21.1%, n= 284) (Table 1).

Table 1. Demographics of the participants

	Gender	**Age**	**Employment**
X ± SD / n (%)	594 male (44%) 755 female (56%)	50.03 ± 8.05	Unemployed Mothers: n = 439 (32.5%) Government Officials: n= 284 (21.1%) Private Sector: n = 229 (17%) Self-Employed: n = 124 (9%) Retired: n = 226 (16.9%,) Unemployed: n = 47 (4%)

Six hundred and 29 of the 1349 participants were found at high risk of having diabetes, while 456 had medium risk and the remaining 264 had a low risk of having diabetes. The results of CanRisk -total, NHP and VAS were represented in Table 2.

The test-retest reliability of the CanRisk was evaluated with ICC; the ICC value was found 0.99 which indicated excellent test-retest reliability of the CanRisk. In addition to that,

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external validity was examined with the Pearson correlation coefficient with NHP and VAS items. There was a statistically significant correlation between CanRisk and NHP (p =0.002, r= 0.233). The relationship of CanRisk with prevention methods for diabetes, knowledge about symptoms of diabetes and perceived physical activity level in the last 6 months were not statistically significant (p>0.05).

Table 2. Mean Visual Analog Scale, Nottingham Health Profile and CanRisk -TR scores

	VAS Protection	**VAS Symptoms**	**VAS Physical Activity**	**CanRisk - TR total**	**CanRisk - TR total (2 weeks after)**	**NHP total**
X ± SD	4.09±2.84	4.25±2.79	5.32±2.61	27.86±9.89	27.84±9.83	116.92±107.30

VAS: Visual Analog Scale, CanRisk: Canada Diabetes Risk Questionnaire, NHP: Nottingham Health Profile

Discussion

This study has described the validity and reliability of the CanRisk-Türk. The results indicate that CanRisk-Türk is a valid and reliable scale and it can be accepted that this scale is suitable for use in the Turkish context.

The CanRisk is available for more than 13 languages, however as well as our knowledge there are only three versions of CanRisk adapted and validated. These are Chinese (Guo et al., 2018), Arab (Alghwiri et al., 2014) and Brazilian Portuguese (Lourenço et al., 2021) language versions of the CanRisk. To ensure psychometric robustness when tools created in one cultural context are used in another, empirical verification is required. As a result, the findings of the present study contributed to the body of literature by supporting the generalizability of CANRISK.

During the adaptation to Chinese, the researchers added “Where did you live in the past decade, rural or urban areas?” into the instrument. The expert panel in the current study defined no corrections to the translated CanRisk and the questionnaire. Similar to our findings the Brazilian Portuguese language and Arab version study expert panel implicated no corrections. These similarities during translations suggest that the CanRisk may be a culture-free instrument.

This study examined the test-retest validity and external validity of CanRisk diabetes risk questionnaire. The CanRisk diabetes risk questionnaire is one of the valuable tools that predicts the risk for an individual to have diabetes. It is found that CanRisk -TR has excellent

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test-retest reliability and acceptable external validity. The studies examined test-retest reliability of CanRisk found great test-retest reliability (Arabic 0.96, Chinese 0.98, Brazilian 0.96) (Alghwiri et al., 2014; Guo et al., 2018; Lourenço et al., 2021), and we found 0.99 which was similar to the literature.

The external validity of the CanRisk has not been tested in the literature. This study is the first study that evaluates the external validity of the CanRisk-Türk by examining the relation with NHP and VAS. It was found that CanRisk-Türk has weak correlation with NHP and no correlation with VAS. It was thought that these findings were excepted because of the nature of the two external validation tools: NHP evaluates the health-related quality of life and VAS was used to determine the knowledge about prevention methods for diabetes, knowledge about symptoms of diabetes and perceived physical activity level in the last 6 months. However, we chose these external tools since there are no other tools that predict the risk of diabetes, hence it was thought that quality of life and diabetes knowledge could be an indicator.

The main limitation of the current study is external validation for CanRisk -TR we used NHP and VAS, it may be preferable to assess model accuracy using HbA1C. Another limitation is cross-sectional design of the study. One of the strengths of our study is the sufficient number of cases and the study sample with varying age groups. Another strength is the study sample taken from both urban and rural areas in Turkey which is important to ensure the generalizability of the results.

Diabetes leads the patient to various health conditions such as obesity, sensory disorders, renal insufficiency, visual disorders, cardiovascular diseases, amputation and mortality. Early detection of diabetes or detection of the risk of diabetes is crucial in terms of prevention from the diseases mentioned above and others. In addition to that, according to International Diabetes Federation's Diabetes Atlas, Turkey has the highest diabetes prevalence in all European countries and the youth population of the country are prone to cardiovascular diseases more than their peers in other countries (Republic of Türkiye Ministry of Health, 2015). Therefore, predicting diabetes risk with non-invasive risk assessment tools becomes more important than it is with this information in Turkey.

In conclusion, the process has produced the CanRisk-Türk, a Turkish version of the CanRisk that is effective and has good validity. We hypothesized that these preliminary findings may pave the way for additional investigation into topics like developing a model

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that might be applied to clinical practice or promoting individual self-management in the prevention of diabetes. In addition, there are 7 different geographical regions in Turkey, and some modifiable factors such as eating habits differ according to these regions. It is suggested to investigate the differences between these regions in the future studies.

Conflict of Interest

None declared.

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References

Akoglu, H. (2018). User's guide to correlation coefficients. *Turkish Journal of Emergency Medicine*, *18*(3), 91-93. https://doi.org/10.1016/j.tjem.2018.08.001

Alghwiri, A., Alghadir, A., & Awad, H. (2014). The Arab Risk (ARABRISK): translation and validation. *Biomed Res*, *25*, 271-275.

American Diabetes Association. (2021). Standards of medical care in diabetes—2021 abridged for primary care providers. *Clinical diabetes: a publication of the American Diabetes Association*, *39*(1), 14.

Beaton, D. E., Bombardier, C., Guillemin, F., & Ferraz, M. B. (2000). Guidelines for the process of cross-cultural adaptation of self-report measures. *Spine*, *25*(24), 3186-3191.

Dall, T. M., Yang, W., Halder, P., Pang, B., Massoudi, M., Wintfeld, N., et al. (2014). The economic burden of elevated blood glucose levels in 2012: diagnosed and undiagnosed diabetes, gestational diabetes mellitus, and prediabetes. *Diabetes care*, *37*(12), 3172-3179.

Demirağ, H. E. (2016). *Tip-2 diabetes mellituslu hastaların birinci derece yakınlarında diyabet risk değerlendirmesi* Adnan Menderes Üniversitesi, Sağlık Bilimleri Enstitüsü].

Guo, J., Shi, Z., Chen, J. L., Dixon, J. K., Wiley, J., & Parry, M. (2018). Translation and validation of the Canadian diabetes risk assessment questionnaire in China. *Public Health Nursing*, *35*(1), 18-28.

Hunt, S. M., McKenna, S., McEwen, J., Williams, J., & Papp, E. (1981). The Nottingham Health Profile: subjective health status and medical consultations. *Social Science & Medicine. Part A: Medical Psychology & Medical Sociology*, *15*(3), 221-229.

International Diabetes Federation. (2015). IDF diabetes atlas. *Int. Diabetes Fed*.

Kücükdeveci, A., McKenna, S., Kutlay, S., Gürsel, Y., Whalley, D., & Arasil, T. (2000). The development and psychometric assessment of the Turkish version of the Nottingham Health Profile. *International journal of rehabilitation research. Internationale Zeitschrift fur Rehabilitationsforschung. Revue internationale de recherches de readaptation*, *23*(1), 31-38.

Lindstrom, J., & Tuomilehto, J. (2003). The diabetes risk score: a practical tool to predict type 2 diabetes risk. *Diabetes care*, *26*(3), 725-731.

Lourenço, I. M., Rêgo, A. S., Diniz, J. G., Bena, M. G. P., Moreira, W. d. S. B., Ferreira, P. R., Soares, et al. (2021). Translation, cross-cultural adaptation, and validation of the Canadian Diabetes Risk Questionnaire for the Brazilian population. *Revista da Associação Médica Brasileira*, *67*, 1810-1815.

Oğuz, A. (2018). The Prospective Urban Rural Epidemiology (PURE) study: PURE Turkey. *Turk Kardiyoloji Dernegi Arsivi: Turk Kardiyoloji Derneginin Yayin Organidir*, *46*(7), 613-623.

Robinson, C., Agarwal, G., & Nerenberg, K. (2011). Validating the CANRISK prognostic model for assessing diabetes risk in Canada's multi-ethnic population. *Chronic Dis Inj Can*, *32*(1), 19-31.

Salman S, Satman İ, Yılmaz C, İmamoğlu Ş, & N, D. (2020). Diabetes Mellitus ve Komplikasyonlarının Tanı, Tedavi ve İzlem Kılavuzu. *BAYT Bilimsel Araştırmalar Basın Yayın*.

Satman, I., Omer, B., Tutuncu, Y., Kalaca, S., Gedik, S., Dinccag, N., et al. (2013). Twelve-year trends in the prevalence and risk factors of diabetes and prediabetes in Turkish adults. *European journal of epidemiology*, *28*(2), 169-180.

Satman, I., Yilmaz, T., Sengul, A., Salman, S., Salman, F., Uygur, S., et al. (2002). Population-based study of diabetes and risk characteristics in Turkey: results of the turkish diabetes epidemiology study (TURDEP). *Diabetes care*, *25*(9), 1551-1556.

Štiglic, G., Fijačko, N., Stožer, A., Sheikh, A., & Pajnkihar, M. (2016). Validation of the Finnish Diabetes Risk Score (FINDRISC) questionnaire for undiagnosed type 2 diabetes screening in the Slovenian working population. *Diabetes research and clinical practice*, *120*, 194-197.

Republic of Türkiye Ministry of Health. (2015). Türkiye Diyabet Programı. *Türkiye halk sağlığı kurumu*, *2020*, 2014.

* Diyabet şeker hastalığı anlamına gelmektedir.

KANADA DİYABET* RİSK ANKETİ - TÜRKÇE

CANRISK – TÜRK

➔ Risk altında mısınız?

Aşağıdaki sorular sizin gizli-diyabet ya da tip 2 diyabet için yüksek risk grubunda olup olmadığınızı öğrenmenize yardım edecek. Gizli-diyabet bireyin, kan şeker düzeyinin normalden yüksek olması ancak henüz diyabet teşhisi alacak kadar yüksek olmaması durumudur. Herhangi bir işaret veya belirti olmaksızın gizli-diyabet ya da tanısı henüz konulmamış tip 2 diyabet olabilirsiniz.

Risk durumunuzu bilmek, sağlıklı seçimler yapabilmenize yardımcı olur, bu da riski azaltır veya hatta diyabet gelişmesini önler.

Soruları lütfen olabildiğince dürüst ve tam olarak cevaplayın. İsterseniz size, bu formu doldurmanızda aileden biri ya da bir arkadaşınız yardımcı olabilir. Bu soruların cevapları tamamen gizli kalacaktır. Bütün soruları cevaplayın. Her bir soru için sağ taraftaki kutuya puanlarınızı yazın ve sonra toplam risk puanınızı hesaplamak için bunları toplayın.

Bu anket 40-74 yaş arası yetişkinler için tasarlanmıştır.

➔ YAŞINIZ İLERLEDİKÇE DİYABETE YAKALANMA RİSKİNİZ ARTAR.

1. Yaş grubunuzu seçin: — **Puan**

- O 40-44 yaş — 0 puan
- O 45-54 yaş — 7 puan
- O 55-64 yaş — 13 puan
- O 65-74 yaş — 15 puan .....

2. Cinsiyetiniz nedir?

- O Erkek — 6 puan
- O Kadın — 0 puan.....

➔ VÜCUT ŞEKLİNİZ VE BEDEN ÖLÇÜNÜZ DİYABET OLMA RİSKİNİZİ ETKİLEYEBİLİR.

Boyunuz ne kadar ve kaç kilosunuz?

Aşağıdaki Beden Kütle İndeksi (BKİ) tablosunun sol tarafından boyunuzu daire içine alın, daha sonra tablonun altından kilonuzu daire içine alın. Tabloda boyunuz ve kilonuzun kesiştiği kareyi bulun ve denk geldiği gölgeli alanı not edin. Örneğin 157,5 cm ve 74 kg iseniz, bunların 29'da kesişmesi nedeniyle AÇIK GRİ alana denk geliyorsunuz.

3. Aşağıdaki seçenekler arasından BKİ grubunuzu seçin:

- O Beyaz (BKİ 25'ten az) — 0 puan
- O Açık gri (BKİ 25-29) — 4 puan
- O Koyu gri (BKİ 30-34) — 9 puan
- O Siyah (BKİ 35 ve üzeri) — 14 puan .....

Boy (cm)	Ağırlık (kg) 44	47	50	53	56	59	62	65	68	71	74	77	80	83	86	89	92	95	98	101	104	107	110	113	116	119	122	125
192.5	12	13	13	14	15	16	17	18	18	19	20	21	22	22	23	24	24	26	26	27	28	29	29	30	31	32	33	34
190	12	13	14	15	16	16	17	18	19	20	20	21	22	23	24	24	25	26	27	28	29	29	30	31	32	33	34	34
187.5	13	13	14	15	16	17	18	18	19	20	21	22	23	24	24	25	26	27	28	29	29	30	31	32	33	34	34	36
185	13	14	15	15	16	17	18	19	20	21	22	22	23	24	25	26	27	28	29	29	30	31	32	33	34	34	36	37
182.5	13	14	15	16	17	18	19	20	20	21	22	23	24	24	26	27	28	29	29	30	31	32	33	34	34	36	37	38
180	14	15	15	16	17	18	19	20	21	22	23	24	24	26	27	27	28	29	30	31	32	33	34	34	36	37	38	39
177.5	14	15	16	17	18	19	20	21	22	23	23	24	25	26	27	28	29	30	31	32	33	34	34	36	37	38	39	40
175	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	34	36	37	38	39	40	41
172.5	15	16	17	18	19	20	21	22	23	24	24	26	27	28	29	29	31	32	33	34	34	36	37	38	39	40	41	42
	15	16	17	18	19	20	21	22	24	24	26	27	28	29	29	31	32	33	34	34	36	37	38	39	40	41	42	43
170	16	17	18	19	20	21	22	23	24	25	26	27	29	29	31	32	33	34	34	36	37	38	39	40	41	42	43	45
167.5	16	17	18	19	21	22	23	24	24	26	27	28	29	30	32	33	34	34	36	37	38	39	40	42	43	44	45	46
165	17	18	19	20	21	22	23	24	26	27	28	29	30	31	33	34	34	36	37	38	39	41	42	43	44	45	46	47
162.5	17	18	20	21	22	23	24	25	27	28	29	30	31	32	34	34	36	37	38	39	41	42	43	44	45	46	48	49
160	18	19	20	21	23	24	24	26	27	29	29	31	32	33	34	36	37	38	40	41	42	43	44	46	47	48	49	50
157.5	18	20	21	22	23	24	26	27	28	29	31	32	33	34	36	37	38	40	41	42	43	45	46	47	48	50	51	52
155	19	20	21	23	24	25	27	28	29	31	32	33	34	36	37	38	40	41	42	43	45	46	47	49	50	51	52	54
152.5	20	21	22	24	24	26	28	29	30	32	33	34	36	37	38	40	41	42	44	45	46	48	49	50	52	53	54	56
150	20	22	23	24	26	27	28	29	31	33	34	35	37	38	40	41	42	44	45	46	48	49	51	52	53	55	56	57
147.5	21	22	24	25	27	28	29	31	32	34	35	37	38	39	41	42	44	45	47	48	49	51	52	54	55	57	58	59
145	22	23	24	26	28	29	31	32	33	34	36	38	39	41	42	44	45	47	48	50	51	53	54	56	57	59	60	62

4. Bir mezura kullanarak, göbek deliği hizasından belinizi çevreleyin.

Nefes verdikten sonra ölçün (nefesinizi tutmayın) ve aşağıdaki çizgiler üzerine sonuçlarınızı yazın. Sonra ölçünüzün olduğu kutucuğu işaretleyin. (Not: Bu ölçü, pantolonunuzun "bel ölçüsü" ile aynı değildir).

ERKEK – **Bel Çevresi: __ __ __ cm**

- O 94 cm.'den az — 0 puan
- O 94-102 cm. arası — 4 puan
- O 102 cm ve üzeri — 6 puan.....

KADIN – **Bel Çevresi: __ __ __ cm**

- O 80 cm.'den az — 0 puan
- O 80-88 cm. arası — 4 puan
- O 88 cm. üzeri — 6 puan.....

* Diyabet şeker hastalığı anlamına gelmektedir.

➔ FİZİKSEL AKTİVİTE DÜZEYİNİZ VE NE YEDİĞİNİZ, SİZİN DİYABET OLMA RİSKİNİZİ ETKİLEYEBİLİR

Puan

➔

5. Genellikle, en az 30 dakika olacak şekilde tempolu yürüyüş gibi fiziksel aktiviteleri yapar mısınız?

Bu aktivite işteyken veya evdeyken yapılabilir.

O Evet — 0 puan
O Hayır — 1 puan

6. Ne kadar sıklıkla sebze veya meyve yersiniz?

O Her gün — 0 puan
O Her gün değil — 2 puan

➔ YÜKSEK TANSİYON, YÜKSEK KAN ŞEKERİ VE GEBELİKLE İLİŞKİLİ FAKTÖRLER DİYABETE EŞLİK EDER.

7. Yüksek kan basıncına sahip olduğunuz bir doktor veya hemşire tarafından hiç söylendi mi VEYA hiç yüksek tansiyon için ilaç kullandınız mı?

O Evet — 4 puan
O Hayır veya bilmiyorum — 0 puan

8. Bir hastalık veya gebelik sırasında kan testi ile kan şekerinizin yüksek olduğu bulundu mu?

O Evet — 14 puan
O Hayır veya bilmiyorum — 0 puan

9. Hiç 4,1 kg veya daha iri bir bebek doğurdunuz mu?

O Evet — 1 puan
O Hayır veya bilmiyorum — 0 puan

➔ AİLEDEN GELEN BAZI DİYABET TİPLERİ

10. Kan bağı olan akrabalarınızdan herhangi biri diyabet tanısı almış mı?

Olanları işaretleyiniz.

O Anne — 2 puan
O Baba — 2 puan
O Kardeşler — 2 puan
O Çocuklar — 2 puan
O Diğer — 0 puan
O Hayır / bilmiyorum — 0 puan

Puanınızı toplayın.
Toplam puanınız 8'i geçemez.
(Her bir kategori için 2 puan alabilirsiniz. Kardeşleri ve çocukları ikinci kez hesaplamayınız).

11. Biyolojik (gerçek) ebeveynlerinizin aşağıdaki etnik gruplardan hangisine ait olduğunu lütfen işaretleyiniz:

ANNE	BABA		
O	O	Beyaz (Kafkas vb)	0 puan
O	O	Aborjin	3 puan
O	O	Siyah (Afro-Karayip)	5 puan
O	O	Doğu Asya (Çin, Kore, v.b)	10 puan
O	O	Güney Asya (Doğu Hindistan, Pakistan)	11 puan
O	O	Diğer (Latin Amerika, Arap, Batı Asya, Türkiye)	3 puan

Sadece en yüksek puanı seçin.
Anne ve baba faklı etnik kökenli olsa bile en yüksek puanlı sadece bir şık seçiniz.(Bu bölüm için puanınız 11'i geçemez).

➔ DİYABET GELİŞMESİNE NEDEN OLABİLEN DİĞER FAKTÖRLER.

12. Tamamladığınız en yüksek eğitim düzeyi nedir?

O Lise terk veya daha düşük — 5 puan
O Lise mezunu — 1 puan
O Üniversite terk — 0 puan
O Üniversite mezunu — 0 puan

Toplam Puan

1'den 12'ye kadar olan soruların puanlarını toplayın

Bu risk puanları hiçbir şekilde gerçek bir klinik tanı yerine geçmez.
Eğer herhangi bir şüpheniz varsa, lütfen aile hekimi, hemşire, eczacı gibi bir sağlık uzmanı ile sonuçlarınızı konuşun.

21'den düşük ➔ Düşük risk

Gizli-diyabet ve tip 2 diyabet olma riskiniz oldukça düşük; sağlıklı olan yaşam tarzınızı sürdürün.

21-32 ➔ Orta düzeyde risk

Belirlenen risk faktörlerinize dayanarak, gizli-diyabet ve tip 2 diyabet olma riskiniz orta düzeydedir. Diyabet riskiniz açısından bir sağlık uzmanına danışabilirsiniz.

33 ve üstü ➔ Yüksek risk

Belirlenen risk faktörlerinize dayanarak, gizli-diyabet ve tip 2 diyabet olma riskiniz yüksek düzeydedir. Kan vererek şeker düzeyinize baktırmak için bir sağlık uzmanına danışabilirsiniz.

Diyabet ciddi bir kronik hastalıktır ve kontrol altında olmayan diyabet kalp hastalığı, böbrek hastalığı ve diğer sorunlara neden olabilir.

Siz yaş, cinsiyet, aile hikayesi ve etnik köken gibi bazı faktörleri değiştiremezken, diyabetin diğer risk faktörlerini yaşam tarzı değişiklikleri ile düzenleyebilirsiniz. Bunlar vücut ağırlığı, fiziksel aktivite, diyet ve sigarayı içerir.

BKİ'niz 25 veya daha yüksek ise, kilo vermeniz tip 2 diyabet olma riskinizi azaltmaya yardımcı olabilir. Vücut ağırlığınızdaki ya da fiziksel aktivitenizdeki ufak bir değişiklik bile riskinizi azaltabilir. Meyve, sebze ve tahılların ağırlıkta olduğu sağlıklı ve dengeli beslenme benimsenmelidir. Yararlı öneriler için bir sağlık uzmanına danışın. Eğer hareketli biri değilseniz, hafiften yükseğe doğru fiziksel aktivitenizi arttırın. Herhangi bir egzersiz programına başlamadan doktorunuza danışın.

Eğer sigara içiyorsanız, bırakmak için asla çok geç değildir. Bu konuda attığınız her adım daha sağlıklı olmanız içindir.
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