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Original Article

The Relationship Between Type 2 Diabetes Risk and Healthy Lifestyle Behaviours of University Students in North Cyprus

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ÖZET

Amaç: Sağlıklı yaşam biçimi davranışlarının geliştirilmesi obezite, tip 2 diyabet gibi yaşam tarzıyla ilintili hastalık risklerini azaltabilir. Bu çalışmanın amacı üniversite öğrencilerinde sağlıklı yaşam biçimi davranışları ve tip 2 diyabet riski ilişkisi ile ilintili faktörlerin belirlenmesidir.

Yöntemler: Çalışma 374 üniversite öğrencisiyle yürütülmüş olup tip 2 diyabet riski ve sağlıklı yaşam biçimi davranışları sırasıyla Finlandiya Tip 2 Diyabet Risk Anketi (FINDRISC) ve Sağlıklı Yaşam Biçimi Davranışları Ölçeği (HPLP)-II ile değerlendirilmiştir. Veriler yüz yüze görüşme ve anket tekniği ile toplanmış olup bazı antropometrik ölçümler tekniklerine uygun olarak yapılmıştır.

Bulgular: HPLPII-Toplam, HPLPII-fiziksel aktivite, HPLPII-beslenme ve tip 2 diyabet riski arasında zayıf ters yönlü ilişkiler belirlenmiştir (sırasıyla $r=-0.13$, $p=0.01$; $r=-0.17$, $p<0.001$; $r=-0.16$, $p<0.001$). Kadın öğrencilerin tip 2 diyabet riskinin erkek öğrencilerden 2.3 kat daha fazla olduğu ve sigara içmenin tip 2 diyabet riskini 2.1 kat artırdığı saptanmıştır ($p<0.05$). Kilolu öğrencilerin tip 2 diyabet riski zayıf öğrencilere kıyasla 3.7 kat fazladır ($p<0.05$).

Sonuç: Tip 2 diyabet riski ve sağlıklı yaşam biçim davranışları, özellikle beslenme ve fiziksel aktivite arasında ilişki vardır. Cinsiyet, yaş, obezite, alkol, sigara, beslenme ve fiziksel aktivite tip 2 diyabet riskine etki eden faktörlerdir. Üniversite eğitiminin bir parçası olarak sağlıklı yaşam biçimiyle ilgili dersler verilmesi ve aktiviteler düzenlenmesi öğrencilerin sağlıklı yaşam biçim davranışları geliştirmesi ve tip 2 diyabet riskinin azaltılmasında yararlı olabilir.

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ABSTRACT

Background/Aims: The development health-promoting lifestyle behaviours can reduce the risk of lifestyle diseases such as obesity, type 2 diabetes. This study aims to determine associated factors and relation between health-promoting behaviour and the risk of type 2 diabetes of university students.

Material and Methods: The study was conducted with 374 university students, and type 2 diabetes risk and health promoting lifestyle behaviours were assessed by The Finnish Type 2 Diabetes Risk Score (FINDRISC) and health promoting lifestyle profile scale (HPLP)-II, respectively. Data was collected by face to face interview and survey techniques and some anthropometric measurements were taken.

Results: There is a weak negative relationship between the scores of HPLPII-Total, HPLPII-physical activity, HPLPII-nutrition, and type 2 diabetes risk ($r=-0.13$, $p=0.01$; $r=-0.17$, $p<0.001$; $r=-0.16$, $p<0.001$, respectively). The lowest FINDRISC score group has the highest HPLPII-NT scores ($p<0.05$). Female students have 2.3 fold increased type 2 diabetes risk than males and students who are smoking have 2.1 fold increased type 2 diabetes risk ($p<0.05$). Overweight students have 3.7 fold increased type 2 diabetes risk compare to underweight students ($p<0.05$).

Conclusion: There is a relationship between type 2 diabetes risk and overall healthy lifestyle behaviours and healthy lifestyle behaviours such as nutrition, physical activity. Gender, age, obesity, alcohol, smoking, nutrition and physical activity are the factors affect type 2 diabetes risk. As a part of university education courses and activities on healthy lifestyle can encourage

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students to develop their health promoting lifestyle behaviours and can be beneficial to reduce the risk of type 2 diabetes risk.

Keywords: healthy lifestyle; diabetes mellitus, type 2; health behaviour

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INTRODUCTION

Lifestyle can be defined as daily routine activities that may affect an individual's health. Healthy lifestyle is defined as having control over all behaviours affecting individuals' health and performing health-promoting daily activities to decrease the risk of diseases (1). A combination of at least four healthy lifestyle factors is associated with the reduction in the all-cause mortality risk by 66% (2). Smoking, alcohol consumption, physical activity, nutrition, and other lifestyle behaviours are associated with the risk of obesity, type 2 diabetes, cancer, and cardiovascular diseases. The role of genes and lifestyle contributing to the rapid increase in the incidence of type 2 diabetes (3). Specifically, changing the dietary and physical activity behaviours are a target of many effective lifestyle programs to reduce the risk of type 2 diabetes (4). Therefore, determining the risk of type 2 diabetes is essential to prevent the disease. The International Diabetes Federation (IDF) has introduced three necessary steps for the prevention of diabetes including determining the risk groups, measuring the risk, and intervention to prevent the development of type 2 diabetes. IDF recommends the use of risk scales like The Finnish Type 2 Diabetes Risk Score (FINDRISC) to identify risk groups (5). University years may cause changes in the social environment and health-related behaviour of students as they are away from family control. Smoking, alcohol consumption, insufficient fruits and vegetable consumption and sedentary lifestyle are frequently observed behavioural changes in university students (6, 7). The development health-promoting lifestyle behaviour of university students includes the development of current and future quality of life of students as well as social health-promoting lifestyle behaviour within the society, which reduces the risk of lifestyle diseases such as obesity, type 2 diabetes, cardiovascular diseases and cancer. Such changes may be

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effective in improving the students' quality of life (8, 9). This study aims to determine associated factors and relation between health-promoting behaviour and the risk of type 2 diabetes of university students.

MATERIAL AND METHODS

Place and Time of the Research and Sample Selection

This study was conducted on the Eastern Mediterranean University students in the 2016 during spring semester. The sample size was defined as 374 university students using random sampling method with a 95% confidence interval and 5% sampling error.

Research Techniques and Tools

A questionnaire consisting of general characteristics and nutritional habits of students, 'Type 2 Diabetes Risk' and 'Health Promoting Lifestyle Profile Scale-II (HPLPII)' was used to collect data through face to face interview and survey technique, which also included anthropometric measurements. The study was approved by the Ethical Board of Scientific Research and Publication of Eastern Mediterranean University dated 14.03.2016 and numbered 2016/23-06. All participants were asked to sign an informed consent form according to the Declaration of Helsinki.

Anthropometric Measurements: Body weight was measured with a 0.1 kg sensitive digital scale, and the height was measured on a frontal plane with a rigid tape measure when the head, back, hips and heels were touching the wall. The waist circumference was measured with a rigid tape measure with the subject standing with legs together and hands lowered freely over the point in between the iliac crest and the rib cage. The hip was measured with a non-stretching tape measure by standing with legs together, and hands lowered freely at the broadest section

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of the hip. The body mass index (BMI) was calculated using the formula: weight (kg)/height (m)². The results were classified as follows: <18.5 kg/m² underweight; 18.5-24.9 kg/m² normal; 25-29.9 kg/m² overweight; ≥30.0 kg/m² obese. In the risk assessment of obesity-associated metabolic complications, waist circumferences which are greater than or equal to 94 cm in males and 80 cm in females were defined as risky while waist circumferences greater than or equal to 102 cm in males and 88 cm in females were defined as high risk. A waist to hip ratio higher than 1.0 in men and higher than 0.85 in women was determined as risky (10). Waist to height ratio is used to determine cardiometabolic risk and type 2 diabetes risk. The optimal cutoff point for Turkish adults was accepted as 0.5 and over that point was associated with increased risk (11).

HPLPII: This scale was developed by Walker et al. in 1987 for measuring the behaviour of various individuals for improving/maintaining health in relation to a healthy lifestyle. HPLPII consist of 52 items and the chronbach alpha coefficient is 0.92 for the Turkish validity and reliability of the scale. The scale consists of 6 sub-dimensions: health responsibility (HR), physical activity (PA), nutrition (NT), spiritual growth (SG), interpersonal relations (IR), and stress management (SM) (12, 13).

FINDRISC: Although there are many risk scoring models to assess type 2 diabetes risk, they require special blood test results which limits the widespread use. This scale serves as a fast, cheap, non-invasive, convenient and simple screening tool for high-risk students to develop type 2 diabetes in the future (5, 14). The FINDRISC questionnaire form consists of eight simple questions of risk factors for type 2 diabetes, and higher scores indicate higher risks (15).

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Statistical Analysis

The independent samples t-test and One-way ANOVA test were used for deductive statistical evaluation of data. The one-way ANOVA post-hoc Tukey's test was used to compare the differences between the groups. Moreover, the Pearson correlation test was used to assess the correlation between HPLPII and FINDRISC scores. Logistic regression analysis was used to assess effect of factor on type 2 diabetes risk. The p value less than 0.05 is accepted as statistically different. Statistical Package for the Social Sciences (SPSS) 21.0 was used for statistical data analysis.

RESULTS

According to table 1 female students had higher mean scores than male students in the HPLPII-T and HPLPII-HR, HPLPII-NT and HPLPII-IR ($p < 0.05$). Students above 21 years of age had higher scores than students below 21 in HPLPII-NT ($p < 0.05$). Students who drink alcohol showed lower mean HPLPII-NT, HPLPII-SG and HPLPII-SM scores than students who not drink alcohol ($p < 0.05$). Students who smoked had lower HPLPII-T, HPLPII-HR, HPLPII-PA, HPLPII-NT, HPLPII-SG and HPLPII-SM scores while had higher FINDRISC scores than students who did not smoke ($p < 0.05$).

Type 2 diabetes risk score increased with increased BMI ranges ($p < 0.05$). Risky and high-risk groups according to the waist circumference and waist to hip ratio had higher mean scores for type 2 diabetes risk than non-risky group ($p < 0.05$) (Table 2).

The lowest FINDRISC score group has the highest HPLPII-NT scores (Table 3). There are weak negative relationships between the scores of the HPLPII-T, HPLPII-PA, and HPLPII-NT

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with the risk of type 2 diabetes ($r=-0.13$, $p=0.01$; $r=-0.17$, $p<0.001$; $r=-0.16$, $p<0.001$, respectively) (Table 4). According to regression results female students have 2.3 fold increased type 2 diabetes risk than males and students who are smoking have 2.1 fold increased type 2 diabetes risk than students who are not smoking ($p<0.05$). Overweight students have 3.7 fold increased type 2 diabetes risk compare to underweight students ($p<0.05$). Also, according to waist circumferences type 2 diabetes risk increased 3.8 fold in risky group and 6.4 fold in high risk group compare to riskless group ($p<0.05$) (Table 5).

DISCUSSION

The health-promoting lifestyle behaviour of youth are shaped during the university years and effect on the quality of life and risk of diseases in the future; therefore, it is essential to evaluate lifestyle behaviour. In this study, The HPLPII-PA demonstrated the lowest score. In other studies, conducted with university students, the lowest score was reported for lifestyle related to physical activity (16-18). Moreover, in our study the mean scores of female students were higher than male students for HPLPII-T, HPLPII-HR, HPLPII-NT and HPLPII-IR. Thus, health-promoting lifestyle behaviour of university students may vary based on their gender (16, 19). Similar results has been found in a study conducted with university students in Japan (20). Female university students present healthier behaviour than male students such as attending social activities, judicious use of alcohol, and visiting a doctor for routine health checks (21). Students above 21 years of age have higher scores than the students below 21 for HPLPII-NT. Previous studies have shown that the highest scores for HPLPII-HR and HPLPII-NT were seen in university students between the age range 23-25 years and above 25 years of age (22, 23).

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There is a positive relationship between the increase in health control focus and health-promoting behaviour (24, 25). Therefore, an increase in health control focus together with the increase in age can be associated with the increase in health responsibility and awareness on health-promoting lifestyle behaviour.

In another study conducted with university students, it was found that in addition to age and gender, there is a relationship between the BMI and HPLPII scores (24). A study conducted with university students in Syria, determined that low intensity and short duration of physical activity play a role in the higher BMI values (25). In this study overweight students have 3.7 fold increased type 2 diabetes risk compare to underweight students . In a study conducted with Turkish population shown that the 10-year cardiovascular risk ratios are increased according to waist circumference categories, either calculated according to the World Health Organisation criteria or according to the proposed cutoff levels 90 cm and 100 cm for males and 80 cm and 90 cm for females (26). In our study, students who have a higher risk of cardiovascular disease according to waist height ratio have a higher risk score for type 2 diabetes risk. In addition, a weak negative relationship was determined between HPLPII-T, HPLPII-PA, HPLPII-NT with FINDRISC score . Previous studies showed that university students did not perform sufficient physical activity and had negative nutritional habits such as skipping meals, frequent fast-food consumption and insufficient consumption of fruits and vegetables (27-29). These could be due to time restrictions for preparing healthy foods and physical activity while planning their course and study hours. In a study conducted in Kuwait students reported that they did not have enough time to prepare healthy diets and could not plan these schedules during the day and they did not have enough time for physical activity due to unfavorable weather conditions (30).

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In this study, it was found that students who consumed alcohol had lower scores for HPLPII-T, HPLPII-NT and HPLPII-SG compared with the students who do not consume alcohol. Moreover, it is indicated that smoking 2.1 fold increased type 2 diabetes risk of university students. In a study to determine the factors that predict healthy behaviour in university students, a high self-sufficiency, which is a reflective factor of spiritual growth, was associated with a decrease in alcohol and smoking and an increase in physical activity and nutritional behaviour (6). In this study, students who smoke have lower mean scores for HPLPII-T, HPLPII-PA, HPLPII-NT, HPLPII-SG and HPLPII-SM compared with the students who do not smoke ($p < 0.05$). In a similar study conducted with university students, it was determined that students who smoke have lower scores for HPLPII-HR, HPLPII-SG and HPLPII-NT compared with students who do not smoke (31). In a study conducted on smoking habits of university students, it was determined that the prevalence of respiratory tract infection was higher while physical fitness was lower in students who smoke than students who do not smoke. In addition, increase in physical activity can be effective in increasing the problem-solving ability; thus it can provide support for stress management and spiritual growth (32). So, interpersonal development and spiritual growth of students is an essential factor affecting smoking and other lifestyle behaviours. Therefore, the biopsychosocial development of university students affects health-promoting lifestyle behaviours and risk of disease. Thus, promoting the SG of students would be conducive to adopting a health-promoting lifestyle behaviour (33).

In a study to assess a range of health behaviours and lifestyle characteristics of undergraduate students from seven universities in the United Kingdom, only a few students were found to follow positive health practices above the recommended levels(34). Another study conducted

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with university students in Turkey, demonstrated that students do not have enough information about maintaining a healthy lifestyle and were not using effective methods of coping with stress (35).

The health education programs to target modifiable risk factors such as unhealthy nutritional habits, physical inactivity and smoking habit may increase the knowledge level and awareness of university students on health-promoting lifestyle behaviours thus may be effective in adopting health-promoting lifestyle behaviour (36). In addition, organising training and courses on healthy lifestyle, and activities related with healthy lifestyle enhances health-promoting lifestyle behaviour in university students (37, 38).

There are several limitations of this study. Firstly, body composition can not be analysed. Thus, to assess major anthropometric measurements can be better to use body composition for further relations between type 2 diabetes and the factors nutrition and physical activity as a main components of quality of life. Secondly, this study conducted at only one university campus, multicenter large sample studies can be beneficial to get more strength relationship between type 2 diabetes and healthy lifestyle behaviours. Thirdly, detailed daily food consumption and physical activity record will be beneficial for further analysis to assess relation with type 2 diabetes risk and these two major lifestyle behaviours.

CONCLUSION

In conclusion, there is a relationship between type 2 diabetes risk and overall healthy lifestyle behaviours and healthy lifestyle behaviours such as nutrition, physical activity. gender, age, waist height ratio, alcohol, smoking, nutrition and physical activity habits are the factors

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affecting healthy lifestyle behaviours and type 2 diabetes risk, and thereby, the quality of life. Courses and activities on healthy lifestyle as a part of university education, well-designed and pittance admission to university food halls which include healthy food choices and sport centers can encourage students to develop their health promoting lifestyle behaviours and can be beneficial to reduce the risk of type 2 diabetes risk. For further studies, to include large multicenter sample size, dietary and physical activity record, body composition analysis can be beneficial to get strength results on this issue.

Main Points

- Healthy lifestyle behaviours are related with increased type 2 diabetes risk among young adults.
- Obesity is related with increase type 2 diabetes risk among young adults.
- Nutritional habits (HPLP-NT) are related with increased type 2 diabetes risk among young adults.
- Physical activity level (HPLP-PA) is related with increased type 2 diabetes risk among young adults.
- Smoking is related with increased type 2 diabetes risk among young adults.

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TABLES

Table 1. HPLPII and Type 2 Diabetes Risk scores of students for their gender, age, alcohol, and smoking habits

		HPLPII-T	HPLPII-HR	HPLPII-PA	HPLPII-NT	HPLPII-SG	HPLPII-IR	HPLPII-SM	FINDRISC
	n	$\bar{x} \pm S$	$\bar{x} \pm S$	$\bar{x} \pm S$	$\bar{x} \pm S$	$\bar{x} \pm S$	$\bar{x} \pm S$	$\bar{x} \pm S$	$\bar{x} \pm S$
Gender									
Male	215	125.2±20.43	17.8±4.80	17.3±5.36	19.1±4.11	26.4±4.69	25.3±4.56	19.0±3.83	6.6±3.79
Female	159	130.5±18.20	19.7±4.49	16.9±4.38	20.0±3.86	27.1±4.43	27.0±4.22	19.5±3.69	6.5±4.50
p		0.009*	<0.001*	0.405	0.006*	0.167	<0.001*	0.161	0.830
Age (year)									
≤21	198	126.0±18.39	16.7±4.19	17.1±4.85	20.1±3.68	26.3±4.50	25.9±4.40	19.0±3.72	6.3±3.92
>21	176	129.0±20.93	17.4±4.55	17.2±5.10	21.2±4.58	27.1±4.65	26.1±4.60	19.4±3.83	6.8±4.29
p		0.133	0.113	0.828	0.015*	0.124	0.682	0.303	0.235
Alcohol consumption									
Yes	185	129.2±18.31	17.3±4.21	17.3±4.60	21.2±4.08	27.3±4.03	25.9±4.39	19.6±3.57	6.1±4.11
No	189	125.6±20.79	16.8±4.53	17.0±5.29	20.1±4.16	26.1±4.99	26.2±4.60	18.8±3.93	6.9±4.07
p		0.077	0.308	0.535	0.007*	0.006*	0.537	0.044*	0.087
Smoking									
Yes	192	124.1±20.14	16.4±4.29	16.5±5.08	19.9±4.29	25.9±4.84	25.8±4.59	18.7±3.84	7.4±4.07
No	182	130.6±17.70	17.6±4.39	17.7±4.79	21.3±3.91	27.4±4.21	26.2±4.40	19.7±3.64	5.7±3.96
p		0.001*	0.009*	0.028*	0.001*	0.002*	0.375	0.009*	<0.001*
Total	374	127.4±19.66	18.6±4.76	17.1±4.97	19.5±4.03	26.7±4.59	26.0±4.50	19.2±3.78	6.5±4.10

*: p<0.05 n: Number, \bar{x} : mean, S: Standard deviation, HPLP: Health promoting lifestyle profile scale, T: Total, HR: Health responsibility, PA: Physical activity, NT: Nutrition, SG: Spiritual growth, IR: Interpersonal relations, SM: Stress management, FINDRISC: Finnish type 2 diabetes risk score

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Table 2. HPLPII and Type 2 Diabetes Risk scores of students for their anthropometric measurements

		HPLPII-T	HPLPII-HR	HPLPII-PA	HPLPII-NT	HPLPII-SG	HPLPII-IR	HPLPII-SM	FINDRISC
	n	$\bar{x} \pm S$							
BMI (kg/m²)									
<18.5	32	132.1±21.66	18.1±4.80	16,8±5.51	21.5±3.99	27.9±4.65	27.4±4.39	19.8±4.02	4.5±3.30 ^a
18.5-24.9	242	126.8±19.94	17.0±4.30	17.2±5.11	20.6±4.19	26.5±4.56	25.8±4.49	19.0±3.82	5.5±3.50 ^b
25.0-29.9	77	126.4±17.67	16.6±4.19	16.6±4.12	20.5±3.95	26.7±4.39	26.1±4.58	19.3±3.19	9.3±3.84 ^c
≥30.0	18	131.2±20.32	17.1±5.27	19.1±5.02	20.4±4.94	27.1±5.54	26.3±4.21	20.1±4.85	11.8±4.16 ^d
p		0.413	0.410	0.262	0.639	0.418	0.300	0.490	<0.001
WC (cm)									
M:<94 F:<80	277	127.2±20.04	17.2±4.33	17.1±5.12	20.8±4.16	26.5±4.52	26.0±4.56	19.0±3,79	5.2±3.27
M:94-102 F:80-88	62	127.4±19.56	16.6±4.45	17.2±4.66	20.0±4.45	27.4±4.24	25.9±3.93	19.6±3.67	9.2±3.25
M:>102 F:>88	35	129.2±17.06	16.8±4.65	17.1±4.29	20.8±3.56	27.2±5.50	26.6±4.94	20.2±3.72	12.4±3.84
p		0.855	0.649	0.980	0.452	0.277	0.765	0.131	<0.001*
WHR									
M:<1.0 F:<0.8	329	127.6±19.7	17.0±4.41	17.3±4.99	20.7±4.23	26.7±4.51	26.0±4.45	19.2±3.78	6.2±3.80
M: ≥1.0 F:≥0.8	45	125.9±19.52	17.2±4.13	16.0±4.66	20.4±3.60	26.4±5.12	26.1±4.83	19.2±3.74	9.0±5.30
p		0.583	0.824	0.097	0.619	0.599	0.954	0.980	<0.001*
WHTR									

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<0.5	223	127.4±20.76	17.2±4.53	17.2±5.35	20.6±4.16	26.6±4.58	26.2±4.48	19.0±3.93	5.0±3.26
≥0.5	137	127.0±18.10	16.8±4.24	16.9±4.25	20.5±4.25	26.9±4.74	25.8±4.66	19.4±3.54	8.9±4.24
p		0.467	0.233	0.364	0.394	0.758	0.338	0.577	<0.001*
Total	374	127.4±19.66	18.6±4.76	17.1±4.97	19.5±4.03	26.7±4.59	26.0±4.50	19.2±3.78	6.5±4.10

^{a, b}: BMI is statistically different than 25.0-29.9 kg/m² and 30.0 kg/m² (p<0.05)

^{c, d}: Statistically different than all other BMI groups (p<0.05)

*: All groups are statistically different of each other (p<0.05)

n: Number, \bar{x} : mean, S: Standard deviation, WC: waist circumference, WHR: Waist to hip ratio, WHTR: waist to height ratio, HPLP: Health promoting lifestyle profile scale, T: Total, HR: Health responsibility, PA: Physical activity, NT: Nutrition, SG: Spiritual growth, IR: Interpersonal relations, SM: Stress management, FINDRISC: Finnish type 2 diabetes risk score

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Table 3. HPLPII scores according to FINDRISC groups

FINDRISC groups		HPLPII-T	HPLPII-HR	HPLPII-PA	HPLPII-NT	HPLPII-SG	HPLPII-IR	HPLPII-SM
	n	$\bar{x} \pm S$						
<7	202	129.2±21.37	17.2±4.66	17.7±5.31	21.2±4.50*	27.0±4.43	26.1±4.45	19.2±3.95
7-11	124	125.1±17.72	16.5±4.09	16.6±4.70	20.0±3.71	26.4±4.61	25.8±4.55	19.3±3.49
12-14	29	125.0±15.57	17.2±3.17	16.0±3.59	19.8±3.70	26.2±4.91	26.1±4.61	18.9±3.66
15-20	19	127.3±17.38	18.1±4.46	16.4±4.08	20.3±2.90	26.1±5.54	26.7±4.60	18.6±3.93
p		0.265	0.363	0.110	0.037	0.545	0.839	0.874

*: Statistically different from all other groups ($P < 0.05$), n: Number, \bar{x} : mean, S: Standard deviation, HPLP:

Health promoting lifestyle profile scale, T: Total, HR: Health responsibility, PA: Physical activity, NT:

Nutrition, SG: Spiritual growth, IR: Interpersonal relations, SM: Stress management, FINDRISC: Finnish type 2 diabetes risk score

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Table 4. The relationship between HPLPII and FINDRISC

		HPLPII-T	HPLPII-HR	HPLPII-PA	HPLPII-NT	HPLPII-SG	HPLPII-IR	HPLPII-SM
FINDRISC	r	-0.130	-0.061	-0.171	-0.174	-0.082	-0.032	-0.051
	p	0.012*	0.239	<0.001*	<0.001*	0.113	0.540	0.322

*p<0.05, n=374, r: Pearson correlation coefficient, n: Number, HPLP: Health promoting lifestyle profile scale, T: Total, HR: Health responsibility, PA: Physical activity, NT: Nutrition, SG: Spiritual growth, IR: Interpersonal relations, SM: Stress management, FINDRISC: Finnish type 2 diabetes risk score

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Table 5. Regression analysis related factors with FINDRISC

	FINDRISC				
	B	(SE)	p	Odds Ratio	95% CI
Age	0.335	0.312	0.282	1.399	0.759-2.578
Gender	0.869	0.338	0.010*	2.384	1.229-4.628
Cigarette	0.779	0.300	0.009*	2.180	1.210-3.927
Alcohol	-0.165	0.291	0.571	0.848	0.479-1.500
BMI (kg/m²)					
18.5-24.9	0.985	0.497	0.047*	2.678	1.012-7.089
25.0-29.9	1.326	0.650	0.041*	3.766	1.054-13.458
≥30.0	1.970	1.410	0.163	7.169	0.452-13.747
WC (cm)					
M:94-102 F:80-88	1.354	0.442	0.002*	3.874	1.631-9.205
M:>102 F:>88	4.118	1.188	0.001*	6.414	5.980-63.697
WHR	-0.132	0.467	0.777	0.876	0.351-2.187
WHTR	0.368	0.408	0.368	1.444	0.649-3.213
HPLPII-T	0.617	0.472	0.191	1.853	0.735-4.670
HPLPII-HR	0.530	0.322	0.100	1.699	0.903-3.197
HPLPII-PA	-0.709	0.331	0.052	0.492	0.357-0.941
HPLPII-NT	-0.580	0.323	0.073	0.560	0.297-1.055
HPLPII-SG	-0.423	0.329	0.198	0.655	0.343-1.248
HPLPII-IR	0.056	0.317	0.859	1.058	0.568-1.970
HPLPII-SM	-0.171	0.312	0.582	0.843	0.457-1.552
Constant	-2.376	0.633	0.000	0.093	

* $P < 0.05$, SE: Standart Error, CI: Confidence Interval, WC: waist circumference, WHR: Waist to hip ratio, WHTR: waist to height ratio, HPLP: Health promoting lifestyle profile scale, T: Total, HR: Health responsibility, PA: Physical activity, NT: Nutrition, SG: Spiritual growth, IR: Interpersonal relations, SM: Stress management, FINDRISC: Finnish type 2 diabetes risk score

Age reference category: 21 year, Gender reference category: male, Cigarette reference category: non smoke, Alcohol reference category: not drink, BMI reference category: <18.5 kg/m², WC reference category: M:<94 F:<80, WHR reference category: M:<1.0, F:<0.8, WHTR reference category: <0.5, HPLPII-T reference category: <127, HPLP-HR reference category: <17, HPLP-PA reference category: <17, HPLP-NT reference category: <20, HPLP-SG reference category: <27, HPLP-IR reference category: <16, HPLP-SM reference category: <19

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