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Original Article *Özgün Araştırma*

THE RELATIONSHIP BETWEEN RISK FACTORS OF ACUTE CORONARY SYNDROME AND HEALTHY LIFESTYLE BEHAVIORS IN PATIENTS WHO APPLIED TO THE EMERGENCY DEPARTMENT WITH CHEST PAIN

Acil Servise Göğüs Ağrısı Şikayeti ile Başvuran Hastalarda Akut Koroner Sendromun Risk Faktörleri ile Sağlıklı Yaşam Biçimi Davranışları Arasındaki İlişki

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ABSTRACT

Objective: Chest pain is one of the potential symptoms of acute coronary syndrome and is the second most common emergency worldwide. Acute coronary syndrome tends to be seen in patients aged <45 years throughout the world. To be able to reduce the admission of patients with high-risk acute coronary syndrome referred to the cardiology polyclinic from the Emergency Department and decrease the morbidity/mortality rates, the association of acute coronary syndrome with healthy lifestyle behaviours should be examined, which will also contribute to a long-term high-quality and disability-free life.

Material and Methods: This cross-sectional study included 70 patients who presented with complaints of chest pain at the emergency department of an A1 Branch Training and Research Hospital between January and March 2022. The relationships were examined between acute coronary syndrome risk factors and healthy lifestyle behaviours using the Healthy Lifestyle Behaviours Scale-II.

Results: In the study population, mean age was 55.06±14.06 years. Of the study population, 31.43% were women. The mean total score in Healthy Lifestyle Behaviours Scale-II was 130.23±19.14, ranging from 91 to 171. The relationship between ACS risk factors and Healthy Lifestyle Behaviours Scale-II examined. A statistically significant medium level positive correlation was found between pain duration, pain severity, troponin with the health responsibility physical activity and diet points ($p<0.05$).

Conclusion: Determining the relationship between possible acute coronary syndrome patients presenting at emergency department with chest pain complaints and the Healthy Lifestyle Behaviours Scale-II is associated with the prevention of initial development of modifiable risk factors, increased awareness and the development of effective and effective behavioural lifestyles to increase the quality of life.

Keywords: *Chest pain, acute coronary syndrome, emergency service, healthy lifestyle behaviour, risk factors.*

ÖZ

Amaç: Göğüs ağrısı, akut koroner sendromun potansiyel semptomlarından biridir ve dünyada acil başvuruları arasında ikinci sıradadır. Akut koroner sendrom dünya genelinde 45 yaş altı hastalarda görülme eğilimi göstermektedir. Acil servisten kardiyoloji polikliniğine yönlendirilen yüksek riskli akut koroner sendrom hastalarının başvurularının ve morbidite/mortalite oranlarının azaltılması için, uzun vadede kaliteli ve engelsiz bir yaşam sürecine katkıda bulunulabilmesi, sağlıklı yaşam biçimi davranışları ile ilişkilidir.

Gereç ve Yöntemler: A1 Dal Eğitim Araştırma Hastanesi Ocak-Mart 2022 tarihleri arasında göğüs ağrısı şikayeti ile acile başvuran 70 gönüllü hastada akut koroner sendrom risk faktörleri ile sağlıklı yaşam biçimi davranışları arasındaki ilişkiyi belirlemek amacıyla bu çalışma kesitsel ve ilişki arayıcı dizaynda yapılmıştır.

Akut koroner sendrom risk faktörleri ile sağlıklı yaşam tarzı davranışları arasındaki ilişkiler Sağlıklı Yaşam Tarzı Davranışları Ölçeği-II kullanılarak incelenmiştir.

Bulgular: Çalışma katılımcılarının yaş ortalaması 55.06±14.06 idi, %31.43'ü kadındı. Sağlıklı Yaşam Tarzı Davranışları Ölçeği-II'nde toplam puan 91 ile 171 arasında değişirken ortalama 130.23±19.14 idi. Akut koroner sendrom risk faktörlerinin ile HLBS-II arasındaki birlikte ilişkisi incelendi. Ağrı süresi, ağrı şiddeti, troponin ile sağlık sorumluluğu fiziksel aktivite ve diyet puanları arasında pozitif yönde orta düzeyde istatistiksel olarak anlamlı ilişki bulundu ($p<0.05$).

Sonuç: Acil servise göğüs ağrısı şikayeti ile ayaktan başvuran olası akut koroner sendrom hastalarının Sağlıklı Yaşam Tarzı Davranışları Ölçeği-II ile ilişkisinin belirlenmesi, özellikle değiştirilebilir risk faktörlerinin ilk gelişiminin önlenmesi, farkındalığın artması ve yaşam kalitesinin artmasına yönelik etkili ve etkin davranışçı yaşam biçimlerinin geliştirilmesi ile ilişkilidir.

Anahtar Kelimeler: *Göğüs ağrısı, akut koroner sendrom, sağlıklı yaşam davranışı, acil servis, risk faktörleri.*

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INTRODUCTION

Chest pain is one of the potential symptoms of acute coronary syndrome (ACS) and is the second most common reason for presentation at the emergency Department (ED) worldwide (1). Just as chest pain may be due to vital causes such as ACS and pulmonary emboli, it may also originate from gastrointestinal disorders or muscle pains (2). In a study conducted on 8474 patients with potential ACS who presented at the ED with chest pain, it was determined that 30.7% of the patients were low risk and 0.4% experienced myocardial infarctus within 30 days (3). It has been reported in literature that approximately 10% of patients presenting at ED with chest pain are diagnosed with ACS. According to the results of serial electrocardiogram and cardiac markers (troponin), the decision is made for hospitalisation or polyclinic referral (4). Previous studies have shown a worldwide trend for ACS to be seen more in those aged <45 years and that years of living with disability increase, together with ACS. It has been reported that in the USA in particular between the years of 1990 and 2016, 20% of the life years disease-related disability from the age 45 to 65 years were created by ACS, and this was two-fold greater for males (5,6). According to the data of the TEKHARF (Heart Disease and Risk Factors in Turkish Adults) study, one of the most important studies conducted in Turkey, there are approximately 3.5 million patients with coronary heart disease, and this number increases by 4% each year with age and it was estimated that 210.000 individuals each year develop coronary artery disease (CAD) (7). The same report stated the importance of risk factors for coronary events such as hypertension, diabetes, abdominal obesity, smoking, high triglycerides (TG), and low high-density lipoprotein HDL cholesterol, which can be modified with a healthy lifestyle. The World Health Organisation (WHO) has reported that more than three-quarters of deaths related to cardiovascular disease (CVD) can be prevented with healthy lifestyle behaviours and quality of life can be improved. The most effective lifestyle interventions in the prevention of modifiable risk factors for ACS are to follow a balanced diet, taking sufficient and regular exercise, quit smoking, taking hygienic precautions, having positive interpersonal relationships and managing stress. One of the most important roles of nurses is to enable individuals to acquire healthy lifestyle behaviours, to increase awareness, and to contribute to a long-term high-quality and disability-free life by increasing adherence to treatment, especially in individuals at risk of high morbidity and mortality, such as those with CAD. To be able to acquire healthy lifestyle behaviours, it is first necessary to evaluate the status of implementation of healthy lifestyle behaviours of patients and the dimensions affecting quality of life with objective measurement methods. The aim of this study was to determine the relationship between healthy lifestyle behaviours and the risk factors of ACS in patients who presented at the ED of an A1 Branch Training and Research Hospital with the complaint of chest pain.

MATERIALS AND METHODS

This cross-sectional study, designed to seek relationships, was conducted to determine the relationship between healthy lifestyle behaviours and the risk factors of ACS in patients who presented at the ED of an A1 Branch Training and Research Hospital with the complaint of chest pain.

Study Universe and Sample

The study universe comprised 5400 patients who presented at the ED of a cardiovascular surgery hospital between January and March 2022, and of these, the study sample consisted of 70 patients who presented as outpatients at the ED with the complaint of chest pain, were admitted to the green zone, had no sensory disability, and agreed to participate in the study. Post hoc power analysis was used to estimate the strength of the observed effect based on the sample size, correlation of pain severity with HLBS-II in our dataset. As a result of the analysis, the power (1-β err prop) was found to be 0.904, when the effect size $|\rho|$ was 0.3, β/α ratio was 1, the sample size was 70.

KÜ Tıp Fak Derg 2023;25(2):215-224
Doi: 10.24938/kutfd.1276883

Data Collection Tools

The patient data were collected using a Patient Information Form (age, blood pressure, body mass index, waist/hip ratio, smoking/alcohol use, chronic diseases, troponin level), a pain evaluation form (Visual Analog Scale [VAS] for pain severity, time and place of pain onset, duration of pain, accompanying symptoms), and the Healthy Lifestyle Behaviors Scale-II (HLBS-II).The HLBS was developed by Walker et al. in 1987 based on the health development model of Pender, to evaluate healthy lifestyle behaviours, and in 1996 the scale was revised as the HLBS-II (8). The HLBS-II consists of 52 items in six subscales of material and spiritual development, interpersonal relationships, diet, physical activity, health reponsibility and stress management. All the items of the scale are positive with responses of 4-point Likert type. The total score ranges from 52 to 208, with higher points in total or for the subscales indicating more positive healthy lifestyle behaviours. The Cronbach alpha value, which is the reliability coefficient is 0.94 for the general scale and in the range of 0.79-0.87 for the six subscales. Validity and reliability studies of the Turkish version of the HLBS-II were conducted by Bahar et al. and the Cronbach alpha value was found to be 0.94 overall, and 0.64-0.80 for the subscale (9).

Statistical Analysis

Data obtained in the study were analyzed statistically using SPSS vn.16.0 software (Statistical Package for the Social Sciences, IBM Inc, Chicago, IL, USA) and G Power (version 3.1.9.4). Descriptive statistics were stated as arithmetic mean ± standard deviation values for continuous variables and as number (n) and percentage (%) for categorical variables. Kolmogorov-Smirnov test was used to test the normality of data distribution. Independent samples one-way ANOVA was used to compare normally distributed continuous variables between more than two groups. Student's t-tests were used to compare normally distributed continuous variables between the two groups. Regression analysis was used to estimate the relationship among variables which have reason and result relation. A value of $p<0.05$ was accepted as statistically significant.Approval for the study was granted by the Ethics Committee of Umraniye Training and Research Hospital (decision no:27364, dated 20.12.2021). All the study participants provided written informed consent to participate in the study.

RESULTS

The demographic characteristics, risk factors related to ACS, and pain-related parameters of the patients who presented with the complaint of chest pain at the ED of a Cardiovascular Training and Research Hospital are presented in Table 1.

Evaluation was made of 70 patients who presented at ED with the complaint of chest pain, comprising 48 (70%) males and 22 (31.43%) females with a mean age of 55.06±14.06 years. Of the total sample, 41.43% were smokers, and 67.14% (n:47) had a chronic disease, of which 34.29% had hypertension, 27.14% had diabetes and 42.86% had heart disease (Table 1). In the blood pressure measurements, systolic blood pressure mean was 137.31±18.39 mmHg, and diastolic blood pressure mean was 72.16±8.78 mmHg. Mean body mass index was calculated as 31.92±31.61 kg/m, and the waist /hip ratio as 0.94±0.46 cm/cm (Table 1). The characteristics related to pain were examined and the mean VAS score was 6.36±1.75. The onset of pain was reported to be at rest in 30 (42.86%) patients, after exercise in 10 (14.29%), after eating in 9 (12.86%), and when walking in 21 (30.00%). The duration of pain was <1 hour in 23 (32.86%) patients, 1-2 hours in 14 (20%), 2-3 hours in 15 (21.43%), 3-4 hours in 11 (15.71%) and >4 hours in 7 (10.00%) (Table 1). The level of troponin was determined as mean 3.58±12.74 (Table 1).

The mean points of the HLBS-II and the subscale points were determined to be as follows: health responsibility: 18.17±5.41(8-51), physical activity: 32.50±7.31 (15-65), diet: 65±14.61 (30-130), spiritual development: 26.13±3.24 (19-35), interpersonal relationships: 25.97±3.02 (19-33), stress management: 19.87±3.47 (13-27), and overall total: 130.23±19.14 (91-171). The data were found to follow a normal distribution ($p>0.05$).

KÜ Tıp Fak Derg 2023;25(2):215-224
Doi: 10.24938/kutfd.1276883

Table 1: The demographic characteristics, risk factors related to ACS, and pain-related parameters of the patients who presented with the complaint of chest pain at the ED

Variable	Min	Max	Mean±SD
Age (years)	23.00	92.00	55.06±14.06
Systolic BP mm/Hg	101.00	176.00	137.31±18.39
Diastolic BP mm/Hg	50.00	92.00	72.16±8.62
Weight kg	46.00	168.00	82.9±18.77
Height cm	77.00	185.00	169±14.07
Body mass index kg/m2	20.40	52.70	28.14±5.14
Waist circumference cm	60.00	127.00	92.89±12.41
Hip circumference cm	22.00	165.00	108.47±16.04
Waist: Hip ratio	0.30	1.00	0.84±0.1
Pain severity	0.00	10.00	6.36±1.75
		n	**%**
Gender	Female	22	31.43
	Male	48	68.57
Smoking status	Non-smoker	36	51.43
	<1 packet per day	18	25.71
	≥1 packet per day	16	22.86
Chronic disease	None	23	32.86
	HT	7	10.00
	Diabetes	4	5.71
	CD	13	18.57
	DM. HT. CD	23	32.86
Onset of pain	At rest	30	42.86
	When walking	21	30.00
	When eating	9	12.86
	When exercising	10	14.29
Duration of pain	30 mins	16	22.86
	30-60 mins	15	21.43
	1-2 hours	19	27.14
	>2 hours	20	28.57
Localisation of pain	Chest	32	45.71
	Chest and back	19	27.14
	Chest-back-arm region	17	24.29
	Chest-left arm-stomach	2	2.86
Accompanying symptoms	None	46	65.71
	Nausea	20	28.57
	Dyspnea	4	5.71

SD: Standard deviation, Min: Minimum value, Max: Maximum value, n: Number of cases, BP: Blood pressure

The relationship between both grand total scores and subscales of HLBS-II and the patient's characteristics (systolic BP, diastolic BP, weight, height, BMI, waist, hips, W/H ratio, pain duration, pain severity, troponin) was investigated. (Table 2). Regression analysis of the relationship between health responsibility, physical activity, diet and patient characteristics was found to be statistically significant ($p<0.05$). A statistically significant medium level positive correlation between pain duration, pain severity, troponin with the health responsibility physical activity and diet points ($p<0.05$).

KÜ Tıp Fak Derg 2023;25(2):215-224
Doi: 10.24938/kutfd.1276883

Table 2: The relationships between the HLBS-II points and the ACS risk factors and pain duration/severity

	HR		PA		D		SD		IR		SM		G	
	Beta	p	Beta	p	Beta	p	Beta	p	Beta	p	Beta	p	Beta	p
Systolic BP	0.121	0.227	0.078	0.368	0.078	0.368	-0.148	0.310	-0.239	0.096	-0.283	0.044	-0.323	0.024
Diastolic BP	0.044	0.669	0.066	0.467	0.066	0.467	0.217	0.156	0.139	0.347	0.089	0.534	0.096	0.509
Weight	-0.097	0.709	0.005	0.984	0.005	0.984	-0.737	0.056	-1.053	0.006	-0.378	0.294	-0.447	0.223
Height	0.052	0.823	-0.077	0.704	-0.077	0.704	0.255	0.451	0.644	0.055	0.097	0.763	0.133	0.682
BMI	0.229	0.493	0.020	0.944	.020	0.944	0.632	0.198	1,027	0.034	0.081	0.860	0.205	0.662
Waist	0.196	0.272	0.192	0.217	0.192	0.217	-0.441	0.093	-0.544	0.034	-0.176	0.474	-0.291	.246
Hips	0.071	0.808	-0.012	0.962	-0.012	0.962	0.975	0.026	1.358	0.002	0.604	0.140	0.644	0.122
W/H ratio	0.017	0.949	0.003	0.991	0.003	0.991	0.845	0.036	1.099	0.006	0.452	0.231	0.508	0.186
Pain duration	0.371	0.001*	0.447	0.001*	0.447	0.001*	0.049	0.722	0.003	0.981	-0.123	0.345	-0.114	0.389
Pain severity	0.495	0.001	0.507	0.001*	0.507	0.001*	-0.136	0.409	0.079	0.622	-0.213	0.174	-0.135	0.391
Troponin	0.027	0.047	0.073	0.040*	0.073	0.040	0.136	0.355	-0.090	0.527	0.109	0.432	0.041	0.770
R	0.788		0.844		0.844		0.441		0.488		0.524		0.505	
R^2	0.621		0.713		0.713		0.195		0.238		0.275		0.255	
p	0.0001*		0.0001*		0.0001*		0.348		0.168		0.079		0.122	

HR: Health responsibility, PA: Physical activity, D: Diet, SD: Spiritual development, IR: Interpersonal relationships, SM: Stress management, G: General total, *statistically significant.

KÜ Tıp Fak Derg 2023;25(2):215-224
Doi: 10.24938/kutfd.1276883

The differences in the general and subscale points were examined according to the demographic characteristics of the patients. In respect of gender, the overall scale points of females were statistically significantly higher than those of males ($p<0.05$). The interpersonal relationship subscale points were determined to be statistically significantly higher in the patients who smoked more than 1 packet of cigarettes a day compared to those who smoked less than 1 packet a day ($p<0.05$). Although not at a statistically significant level, the health responsibility, physical activity, and diet subscale points and the overall HLBS-II points were higher in the non-smokers (Table 3).

Table 3: Relationships between the HLBS-II points and the patient demographic characteristics, chronic disease, ACS risk factors, localisation and onset of pain, and symptoms accompanying pain

	HR	PA	D	SD	IR	SM	G
Gender							
Female	16.86±3.14	31.09±5.63	62.18±11.26	27.05±2.89	26.5±2.99	20.77±3.12	137.5±18.18
Male	18.77±6.11	33.15±7.93	66.29±15.86	25.71±3.34	25.73±3.03	19.46±3.57	126.9±18.82
T	-1.38	-1.09	-1.09	1.62	0.99	1.48	2.21
p[1]	0.17	0.28	0.28	0.11	0.32	0.14	**0.03***
Smoking status							
Non-smoker	19.33±6.34	33.86±7.6	67.72±15.2	25.94±2.65	25.58±2.75	19.86±2.94	192.27±15.49
<1 packet per day	16.44±4.46	30.17±8.02	60.33±16.05	25.67±4.41	25.28±3.98	19.22±4.93	127±26.58
>1 packet per day	17.5±3.27	32.06±5.17	64.13±10.34	27.06±2.95	27.63±1.54	20.63±2.55	181.38±15.89
F	1.92	1.60	1.60	0.90	3.40	0.69	1.51
p[2]	0.15	0.21	0.21	0.41	**0.04***	0.51	0.23
Chronic disease							
None	16.26±8.32	29.96±10.28	59.91±20.57	27.26±2.91	26.39±2.37	20.96±3.52	138.09±17.57
HT	16.86±2.61	31.71±5.22	63.43±10.44	25.43±4.58	24.71±3.99	18.86±4.74	121.57±25.08
Diabetes	19±4.97	35±9.93	70±19.87	22.25±3.2	24.5±4.2	18±3.16	118.25±22.5
Heart disease	17.23±2.01	30.38±4.07	60.77±8.15	26.23±3.14	27.08±2.5	20.23±3.37	133±19.53
DM/HT/ HD	20.87±1.55	36.04±2.8	72.09±5.61	25.83±2.77	25.57±3.29	19.22±2.98	125.52±15.81
F	2.60	2.70	2.70	2.46	1.21	1.26	2.29
p[2]	**0.04***	**0.04***	**0.04***	0.05	0.32	0.29	0.07
Onset of pain							
At rest	18.17±7.16	31.73±8.71	63.47±17.43	26.13±3.34	26.27±3.02	19.97±3.15	130.87±18.05
When walking	16.43±3.36	30.29±5.32	60.57±10.64	25.67±3.38	25±2.97	19.57±4.47	128.1±21.26
When eating	20.33±3.54	36.44±6.8	72.89±13.61	25.67±3.87	25.11±3.1	19.56±3	125±19.94
When exercising	19.9±2.77	35.9±4.33	71.8±8.66	27.5±1.78	27.9±2.23	20.5±2.68	137.5±17.43
F	1.59	2.50	2.50	0.79	2.60	0.19	0.80
p[2]	0.20	0.07	0.07	0.50	0.06	0.90	0.50
Localisation of pain							
Chest	18.06±7.17	31.72±9.04	63.44±18.08	25.25±3.46	25.91±3.26	19.28±3.64	126.44±19.78
Chest/back	17.68±3.27	32±5.12	64±10.24	27.26±2.31	26.84±2.43	20.42±3.19	136.37±15.03
Chest/back/arm	19.06±3.63	34.47±6.06	68.94±12.13	26.53±3.59	25.12±3.22	20.35±3.67	130.12±22.22
Chest/arm/stomach	17±0	33±0	66±0	26±0	26±0	20±0	133.5±0.71
F	0.23	0.56	0.56	1.70	0.99	0.57	1.09
p[2]	0.87	0.65	0.65	0.18	0.40	0.64	0.36
Accompanying symptoms							
None	18.07±6.41	32.07±8.42	64.13±16.85	26.85±3.25	26.61±3.01	20.63±3.47	135.28±19.1
Nausea	18.5±2.65	33.7±4.35	67.4±8.71	24.85±2.48	24.5±2.35	18.3±2.87	119.15±14.26
Dyspnea	17.75±3.2	31.5±5.45	63±10.89	24.25±4.57	26±4.24	19±4.24	127.5±21.19
F	0.06	0.38	0.38	3.61	3.67	3.52	5.67
p[2]	0.95	0.68	0.68	**0.03***	**0.03***	**0.04***	**0.01***

HR: Health responsibility; PA: Physical activity; D: Diet; SD: Spiritual development; IR: Interpersonal relationships; SM: Stress management; G: General total; Differences between groups; (1) student' s t test; (2) One-way ANOVA *statistically significant

KÜ Tıp Fak Derg 2023;25(2):215-224
Doi: 10.24938/kutfd.1276883

The differences in the points of the health responsibility, physical activity, and diet subscale points were found to be statistically significant according to the presence of a chronic disease ($p<0.05$) (Table 3). The health responsibility, physical activity, and diet subscale points of patients with diabetes, hypertension, and heart disease were seen to be higher than those of patients with no chronic disease (Table 3). No statistically significant relationship was determined between the onset and localisation of pain and the HLBS-II points. In patients with no symptoms accompanying pain, the differences in spiritual development, interpersonal relationships, stress management subscales and overall healthy lifestyle points were found to be statistically significantly high ($p<0.05$) (Table 3).

DISCUSSION

The fact that healthy lifestyle behaviours have positive effects on acute coronary syndrome (ACS) is accepted worldwide. In a meta-analysis of 22 articles showing the relationship between healthy lifestyle behaviours and cardiac health, most of the lifestyle indexes included physical activity, smoking, diet, alcohol consumption, and body weight, and the results showed that a healthy lifestyle was associated with a 66% decrease in the risk of cardiovascular disease (10). The American Heart Association's 2020 strategic impact goals were to improve cardiovascular health with 7 health behaviours.

Of these, 4 were defined as modifiable health behaviours: smoking, body mass index, physical activity, and diet, and the other 3 as biometric factors: blood pressure, glucose level, and cholesterol level.

Primary prevention is the basic component of promoting ideal cardiovascular health, and focuses on to avoid the initial development of risk factors through the adoption of healthy lifestyle behaviours (11). Compliance with the defined strategic targets can be evaluated with examinations of health responsibility, physical activity, diet, spiritual development, interpersonal relationships, and stress management with the Healthy Lifestyle Behaviours Scale.

In the KaiLuan study in China, questionnaires were completed by 81.110 males and 20.400 females in 11 hospitals between June 2006 and 2019, and clinical examinations and laboratory tests were evaluated every two years. At the end of 4 years, improvements were obsereved in the general cardiovascular health status of participants who optimised risk factors and cardiovascular health behaviours, independent of their baseline cardiovascular health, and a significant correlation was observed between these improvements and a reduced risk of subsequent cardiovascular disease (11).

The current study showed that although not at a stastically significant level, non-smokers had higher health responsibility, physical activity, healthy diet, and overall lifestyle behaviour points. In a study conducted at a Spanish university with 19.336 participants, related the disease-free life expectancy, with never smoking, physical activity of >20 METs-hr/week, adherence to a Mediterranean diet (≥4/8 points), low BMI (≤22), moderate alcohol intake (females: 0.1-5 g/day, males: 0.1-10 g/day, ≤5 alcoholic drinks), low exposure to television (≤2 hrs/day), short afternoon naps (<30 mins/day), meeting friends for >1 hour/week, and working for >40 hours per week.

A 78% decrease was observed in primary cardiovascular disease risk in those with higher points of disease-free life marker (7-10 points) compared to those with lower points (0-3 points). Each healthy habit was associated with a lower personal risk of cardiovascular disease (12). In parallel with all these previous studies, potential ACS is an expected outcome for patients presenting to the ED of a Cardiovascular Surgery Hospital with chest pain. The results of the current study showed a statistically significant positive medium level correlation between pain duration, pain severity, troponin level with the health responsibility physical activity and diet points ($p<0.05$) (Table 2). A waist/hip ratio >1.0 in males and >0.8 in females is known to be a significant risk factor for diabetes, hypertension, and cardiovascular diseases. Of the current study's participants, 67.14% had a chronic disease; and the health responsibility, physical activity, and diet subscale points were higher compared

KÜ Tıp Fak Derg 2023;25(2):215-224
Doi: 10.24938/kutfd.1276883

to those with no chronic disease ($p<0.05$) (Table 1). In a study analysing the WHO mortality reports of 5 countries between 2005 and 2015, a worsening of metabolic risk factors such as BMI, diabetes mellitus, hypertension, and high cholesterol was reported to be the most significant factor in the expected increased mortality in coronary artery diseases in the future (13). When the healthy lifestyle behaviours were evaluated in patients with more than one chronic disease who presented at the ED with the complaint of chest pain, the health responsibility, physical activity, and diet subscale points were determined to be higher. The perception of chronic disease brings together the idea of protecting long-term health-related quality of life and lifestyle changes of patients. In a survey study conducted on 779 patients with premature atherosclerosis in Tehran Heart Centre, a strong relationship was found between long-term quality of life precautions and both physical and mental subscale points (14).

In a study conducted on 626 overweight/obese adults, aged 55-75 years, with metabolic syndrome, ACS was correlated with the subscales of BMI, physical activity, and diet of healthy lifestyle behaviour. In the restricted energy Mediterranean diet group, encouragement of physical activity and behavioural support, a significant improvement in cardiovascular risk factors, including weight loss of >5%, waist circumference, fasting glucose, triglycerides, and HDL cholesterol was observed (15). In another prospective study of 116.043 subjects with a mean age of 43.7 years, healthy lifestyle behaviours related to smoking, BMI, physical activity, and alcohol consumption were evaluated as 12 different points, and a direct relationship was determined between the overall healthy lifestyle points and the number of disease-free years. These four healthy lifestyle behaviours and BMI were correlated with the number of disease-free years (16). In another study of 22.672 patients with stable coronary disease for 5 years, a greater risk of cardiovascular event in those with systolic blood pressure >140mmHg was determined (17).

A randomised, controlled study of 150 subjects with clinical blood pressure ≥130/80 mmHg who were not taking any drugs and 150 subjects with blood pressure defined as controlled at <130/80 mmHg taking antihypertensive drugs for at least 6 weeks, showed that a change in lifestyle and behaviour was effective in preventing and reducing the development of cardiovascular diseases (18). A negative correlation was found between stress management points and systolic blood pressure, which is an important finding of cardiovascular diseases, and pain severity. In the data obtained from 15 studies conducted over a mean period of 13.8 years, including 229.391 subjects, it was determined that optimism reduced the risk of a cardiovascular event (19).

In the current study, the mean VAS score of the patients presenting at ED with chest pain was 6.36±1.75. In the previous studies it was shown that although the reason of the chest pain in 20% of the patients was cardiovascular, only 5.5% of these patients had an acute life-threatening condition, and more than half of the patients presenting with chest discomfort are accepted as low risk with a non-cardiac cause of pain (20). According to the results of a questionnaire related to chest pain applied to 1029 emergency medicine physicians, cardiac pain was seen to be overlooked at the rate of 1% because of the focus on major cardiac events (21).

In another prospective study, it was found that 3.7% of the patients were incorrectly discharged and represented with major adverse cardiac events within 60 days (22). Therefore, even if chest pain is not acute in patients presenting at ED, it is the most important symptom in respect of potential coronary syndrome. When the results of the current study were examined, the positive relationship between health responsibility, physical activity, and diet subscale points, and the negative relationship between stress management and the general scale points, were an expected result.

According to the 2021 guidelines, chest pain is predominant and the most frequently seen symptom in both males and females diagnosed with ACS, and pain, pressure, tightness or discomfort in the chest, shoulders, arms, neck, back, upper abdomen or jaw, shortness of breath and fatigue have been accepted as anginal

KÜ Tıp Fak Derg 2023;25(2):215-224
Doi: 10.24938/kutfd.1276883

equivalents. It has also been reported that in females there may be more symptoms accompanying chest pain, such as nausea and shortness of breath (23). No statistically significant relationship could be found in this study between the onset and localisation of pain and the HLBS-II points. In patients with no symptoms accompanying pain, the differences in spiritual development, interpersonal relationships, stress management subscales and overall healthy lifestyle points were found to be high at a level that would show statistical significance.

The results of this study of patients who presented at ED with chest pain, demonstrated a negative correlation of healthy lifestyle behaviours with systolic blood pressure, waist/hip ratio, and weight, and a postive correlation with the presence of a chronic disease, the duration of pain, and pain severity. In the patients with modifiable risk factors, healthy lifestyle behaviour was seen insufficient, especially in the areas of physical activity, diet, and health responsibility, but in those with a chronic disease, it was seen that greater care was shown to healthy lifestyle behaviours, especially by patients with diabetes or hypertension, which was thought to be due to seeing a doctor more regularly, and efforts directed at health literacy and patient education in specific areas. Instilling healthy lifestyle behaviors in potential ACS patients presenting to the emergency department with chest pain is an important factor in preventing modifiable risk factors.

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