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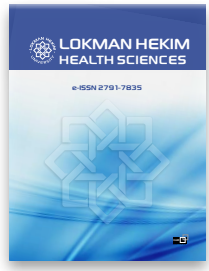

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ORIGINAL ARTICLE

Evaluation of Cardiovascular Risk, Knowledge Level, and Mental Well-Being in Individuals Visiting a Cardiology Outpatient Clinic During the Pandemic

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Abstract

Introduction: This study aimed to assess the cardiovascular disease risk status, knowledge levels, and mental well-being of individuals visiting a cardiology outpatient clinic during the COVID-19 pandemic. It also aimed to evaluate how the pandemic influenced disease management and health service access.

Methods: A cross-sectional study was conducted with individuals aged 40–65 at Gülhane Training and Research Hospital. Cardiovascular disease risk was calculated using the Systematic Coronary Risk Evaluation 2 (SCORE2) algorithm. Knowledge levels were assessed using the Cardiovascular Disease Risk Factors Knowledge Level Scale (CARRF-KL), and mental well-being was measured by the World Health Organization-Five Well-Being Index (WHO-5). Statistical analysis was performed using SPSS 25.0.

Results: The study included 395 individuals. Among participants, 43.3% were in the low-moderate risk group, 46.1% in the high-risk group, and 10.6% in the very high-risk group. Higher risk was associated with older age, male gender, smoking, and lower educational attainment. Although knowledge levels were higher among university graduates and individuals who exercised regularly, no significant association was found between knowledge level and cardiovascular risk. Mental well-being was significantly lower in women, unmarried individuals, and those with low income. Participants with higher well-being scores had better knowledge levels.

Discussion and Conclusion: Cardiovascular disease risk is shaped by sociodemographic, behavioral, and psychosocial factors. The pandemic negatively affected healthcare access and mental well-being. Knowledge about risk factors is important, but alone it does not significantly reduce risk. This highlights the importance of public health strategies focused on behavioral change and mental health support.

Keywords: Cardiovascular diseases risk; CARRF-KL; SCORE2; WHO-5.

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Non-communicable diseases (NCDs) are among the most common causes of death globally and have a significant impact, particularly in low- and middle-income countries. According to 2021 data from the World Health Organization (WHO), approximately 43 million deaths worldwide were attributed to NCDs. Of these deaths, about 44% (19 million) were caused by cardiovascular diseases (CVD). Studies predict that CVD-related deaths will reach approximately 22.2 million globally by 2030.[1]

The prevalence of CVD continues to rise, particularly due to the influence of preventable risk factors. CVD is directly associated with risk factors such as lifestyle, unhealthy dietary habits, tobacco and tobacco product use, stress, and physical inactivity.[2] Early detection of these risk factors and effective intervention are critical in preventing these diseases. Identifying at-risk individuals is suggested to help prevent CVD cases.[3,4] Healthcare professionals play a pivotal role in directing individuals to early diagnosis and treatment, raising awareness about risk factors, fostering societal consciousness, and providing necessary education. Furthermore, individuals' knowledge of CVD risk factors and their ability to take preventive measures against modifiable risk factors are of great importance for primary prevention.[5]

The COVID-19 pandemic has negatively impacted efforts to enhance NCD management and awareness. During the pandemic, behavioral changes emerged, including increased unhealthy dietary habits, physical inactivity due to quarantine measures, and higher tobacco and alcohol consumption. These effects have adversely influenced the management of NCD risk factors during the pandemic period.[6] Limited access to healthcare services disrupted routine medical check-ups and caused interruptions in chronic disease management, contributing to increased risks of morbidity and mortality.[7]

Additionally, the COVID-19 pandemic has had adverse effects on individuals' psychosocial health and exerted significant pressure on mental well-being. Mental well-being, a fundamental component of healthy living, directly influences individuals' tendencies to reduce risk factors.[8]

This study aims to assess the relationship between individuals' knowledge levels of CVD risk factors and their risk status, examine the impact of the COVID-19 pandemic on CVD management, and investigate the connection between these factors and mental well-being. Additionally, this study is expected to make a significant contribution to the literature, as it is the first study conducted in Türkiye using the Systematic Coronary Risk Evaluation 2 (SCORE2) system. This article has been derived from the master's thesis titled "Assessment of the Risk Status and Knowledge Level of Cardiovascular Diseases in Individuals Applying to the Cardiology Outpatient Clinic During the Pandemic Period."

Material and Methods

This is a cross-sectional study conducted in the Cardiology Outpatient Clinic of Gulhane Training and Research Hospital. The study was approved by the Clinical Research Ethics Committee of Gulhane Training and Research Hospital, University of Health Sciences, with the decision number 2021/14 on April 28, 2021.

The study was planned to be completed within a 3-month period during the COVID-19 pandemic. Therefore, while designing the study, 4617 individuals aged 40-65 years who applied to the Cardiology Outpatient Clinic in the last 3 months (November 2020 - January 2021) were taken as the population. Assuming that the prevalence of CVD was 50%, the minimum sample size was calculated as 355 people using the OpenEpi program with a 95% confidence interval and a design effect of 1.0. A total of 395 individuals who met the inclusion criteria were included in the study.

Inclusion Criteria

- Aged between 40-65 years,
- Agreeing to participate in the study,
- Having a lipid profile and fasting blood glucose measurement within the last 6 months.

Exclusion Criteria

- Individuals diagnosed with ischemic CVD through invasive or non-invasive tests (coronary angiography, nuclear imaging, stress echocardiography, etc.),
- Individuals with a history of myocardial infarction (MI), acute coronary syndrome (ACS), revascularization procedures, ischemic stroke, or peripheral arterial disease,
- Individuals diagnosed with chronic kidney failure,
- Individuals diagnosed with Diabetes Mellitus. In line with the SCORE2 algorithm protocol, participants with diabetes were excluded from the model development phase as they are automatically classified in the high-risk category according to current European Society of Cardiology (ESC) guidelines.
- Psychiatric patients with cooperation disorders,
- Individuals who cannot communicate in Turkish or cannot answer questions due to cognitive impairment.

Procedure

Between 1 November 2021 and 31 January 2022, individuals who applied to the Cardiology Outpatient Clinic of Gulhane Training and Research Hospital and who met the inclusion criteria and volunteered to participate in the study were included.

In this cross-sectional study, the discrepancy between the sample size calculation period (November 2020-January 2021) and the data collection period (November 2021-January 2022) was intentionally designed to align with the same seasonal interval during the ongoing COVID-19 pandemic. This alignment ensures a consistent evaluation of the pandemic's dynamic effects on the study outcomes, minimizing confounding factors related to seasonal variations.

Written informed consent was obtained from all participants. Participants were asked to fill out a questionnaire form containing sociodemographic characteristics, lifestyle behaviors, and their hospital application status during the COVID-19 pandemic period. Blood pressure measurements were performed using a calibrated Omron-M7 Intelligent digital blood pressure monitor, following the guidelines and proper techniques.

The following scales were used to evaluate the participants' CVD risk status, knowledge levels, and well-being.

SCORE2 (Systematic Coronary Risk Evaluation) Risk Prediction Algorithm

The SCORE2 risk prediction algorithm is used to predict 10-year fatal and non-fatal cardiovascular events (such as myocardial infarction, stroke) in apparently healthy individuals aged 40-69. This system calculates risk by considering variables such as age, gender, systolic blood pressure, total cholesterol, HDL-C, non-HDL-C, and smoking status.[9]

Cardiovascular Disease Risk Factors Knowledge Level (CARRF-KL) Scale

CARRF-KL Scale is a 28-item scale adapted from the "Heart Disease Fact Questionnaire (HDFQ)" with 16 items and the "40-Item Coronary Heart Disease Knowledge Test" with 4 items. The items were translated into Turkish, and eight additional items (5, 8, 9, 10, 17, 18, 22, 26) considered essential by the researchers regarding cardiovascular disease risk factors were added. The items in the scale are in the form of true or false full sentences, with responses coded as 'True,' 'False,' or 'I don't know.' Correct answers are scored as 1 point. Each "correct answer" receives 1 point, while "I don't know" and incorrect answers receive 0 points. The maximum score on the scale is 28, and the minimum score is 0. As the score increases, the knowledge level is considered to increase.[10]

The World Health Organization-Five Well-Being Index (WHO-5 Well-being Index)

The WHO-5 Well-Being Index is a short and general global rating scale that measures subjective well-being. The survey consists of 5 items reflecting positive feelings about the participant's emotions in the past two weeks. These five items are: "I felt cheerful and in good spirits," "I felt calm and relaxed," "I felt active and vigorous," "I woke up feeling fresh and rested," and "My daily life was filled with things that interest me." Each item is rated on a 6-point Likert scale ranging from 0 to 5, where 0 indicates no positive feelings in the past two weeks and 5 indicates continuous positive feelings. The raw score is calculated by summing the responses for the five items. The raw score ranges from 0 to 25, with 0 representing the worst possible and 25 representing the best possible quality of life. A score below 13 indicates poor quality of life.[11]

Statistical Analysis

The data were analyzed using the IBM SPSS Statistics (Version 25.0, IBM Corp., Armonk, NY, USA) program. Normal distribution was assessed using the Kolmogorov-Smirnov and Shapiro-Wilk tests. Comparisons between two independent groups were performed using the Mann-Whitney U test. Comparisons between more than two groups were analyzed using the Kruskal-Wallis test and the Bonferroni-corrected post-hoc Mann-Whitney U test. Categorical variables were evaluated using the Chi-square test. Correlation analyses were performed using the Spearman correlation test. The statistical significance level was set at $p<0.05$.

Results

A total of 395 individuals participated in this study, with 54.4% of the participants being female and 45.6% being male. The average age was 49.2±6.6 years, with ages ranging from 40 to 65 years. A large majority of the participants (87.3%) were married, and 95.7% lived with their families (Table 1).

When evaluated in terms of body mass index (BMI), it was determined that 23.5% were of normal weight, 46.8% were overweight (pre-obese), and 29.4% were obese. The rate of being overweight was higher in men, while the rate of obesity was higher in women (Table 1).

Table 1. Sociodemographic characteristics of participants

Sociodemographic characteristics (n=395)	n	%*
Age		
40–44	115	29.10
45–49	116	29.40
50–54	77	19.50
55–59	50	12.70
60–64	29	7.30
65 and above	8	2.00
Gender		
Female	215	54.40
Male	180	45.60
Body Mass Index (BMI)		
Underweight	1	0.30
Normal	93	23.50
Overweight	182	46.80
Obese	116	29.40
Marital status		
Not married	50	12.70
Married	345	87.30
Living arrangement		
Living alone	17	4.30
Living with family	378	95.70
Educational level		
Primary education	147	37.20
High school	117	29.60
University and above	131	33.20
Tobacco use		
Yes	126	31.90
No	269	68.10
Employment status		
Currently employed	186	47.10
Not working	209	52.90
Retired	63	15.90
Unemployed	14	3.50
Other	6	1.50
Household income level		
Monthly income < expenses	137	34.70
Monthly income = expenses	196	49.60
Monthly income > expenses	62	15.70
Health insurance status		
Yes	356	90.10
No	39	9.90
Exercise habits		
Never exercises	137	34.70
Occasionally exercises	217	54.90
Regularly exercises	41	10.40

*: Column Percentage; SD: Standard deviation.

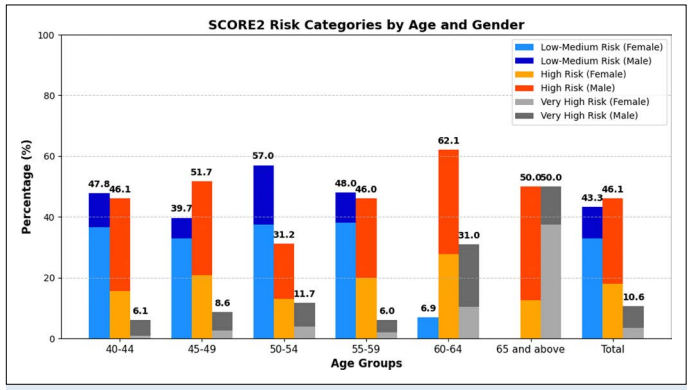

Figure 1. SCORE2 risk categories by age and gender.

SCORE2: Systematic COronary Risk Evaluation 2.

Of the participants, 35.9% have CVD, and 30.4% have chronic diseases other than CVD. 47.6% are on continuous medication, and 56.5% have a family history of CVD.

In terms of health perception, 44.6% described their general health as "good," 49.3% as "average," and 4.3% as "poor."

Looking at health behaviors, 31.9% use tobacco, and 23.3% consume alcohol. 74.4% follow a low-salt diet, while 19.7% have a high-salt diet. 34.7% do not exercise at all, and among those who exercise, most reported exercising 1-3 days a week, while only 10.4% engage in regular exercise.

During the pandemic, when looking at health behaviors, 36.5% of participants reported postponing medical appointments due to the COVID-19 pandemic. The most common reasons were 72.9% for maintaining physical distance, 37.5% due to difficulty accessing healthcare services, and 19.4% for directly obtaining prescribed medications from pharmacies.

During the pandemic, 25.3% reported having had COVID-19, and 34.7% sought emergency care for reasons other than COVID-19.

The CVD risk was assessed using the SCORE2 risk prediction algorithm. Of the participants, 43.3% were in the low-moderate risk group, 46.1% in the high-risk group, and 10.6% in the very high-risk group (Fig. 1).

As age increased, the proportion of high and very high-risk individuals also increased, with a significant rise in the very high-risk group, particularly among those aged 60 and over. The proportion of high and very high-risk individuals was significantly higher in men compared to women ($p<0.001$) (Fig. 1).

Significant differences were observed between the SCORE2 risk categories and certain sociodemographic variables; the risk rate was higher among those who use tobacco and

Table 2. Comparison of Participants Cardiovascular Disease Risk Levels (SCORE2), WHO-5 Well-Being Index, CARRF-KL scale scores with sociodemographic characteristics

Sociodemographic characteristics	SCORE2				WHO-5			CARRF-KL	
Variable	**Low-medium risk n (%)**	**High risk n (%)**	**Very high risk n (%)**	**p***	**Poor n (%)**	**Good n (%)**	**p***	**Median (Min-Max)**	**p**
Age				<0.001			0.777		0.565**
40-44	55 (47.80)	53 (46.10)	7 (6.10)		59 (51.30)	56 (48.70)		20 (5-27)	
45-49	46 (39.70)	60 (51.70)	10 (8.60)		60 (51.70)	56 (48.30)		20 (1-28)	
50-54	44 (57.10)	24 (31.20)	9 (11.70)		39 (50.60)	38 (49.4)		20 (7-26)	
55-59	24 (48.00)	23 (46.00)	3 (6.00)		26 (52.00)	24 (48.000)		21 (5-26)	
60-64	2 (6.90)	18 (62.10)	9 (31.00)		11 (37.90)	18 (62.10)		20 (5-26)	
65 and above	0 (0)	4 (50.00)	4 (50.00)		3 (37.50)	5 (62.50)		18 (8-23	
Gender				<0.001			<0.001		0.027***
Female	130 (60.50)	71 (33.00)	14 (6.50)		126 (58.60)	89 (41.40)		20 (5-27)	
Male	41 (22.80)	111 (61.70)	28 (15.60)		72 (40.00)	108 (60.0)		21 (1-28)	
BMI				0.435			0.335		0.364**
Underweight	1 (100)	0 (0)	0 (0)		1 (100)	0 (0)		16 (16-16)	
Normal	47 (50.50)	36 (38.70)	10 (10.80)		40 (43.00)	53 (57.00)		20 (7-26)	
Overweight	71 (38.40)	93 (50.30)	21 (11.40)		96 (51.90)	89 (48.10)		20 (5-28)	
Obese	52 (44.80)	53 (45.70)	11 (9.50)		61 (52.60)	55 (47.40)		20 (1-27)	
Marital status				0.307			0.007		0.857***
Married	145 (42.00)	161 (46.70)	39 (11.30)		164 (47.50)	181 (52.50)		20 (1-28)	
Not married	26 (52.00)	21 (42.00)	3 (6.00)		34 (68.00)	16 (32.00)		20 (12-25)	
Education level				<0.001			0.001		<0.001**
Primary Education	75 (51.00)	54 (36.70)	18 (12.20)		90 (61.20)	57 (38.80)		20 (5-26)	
High school	47 (40.20)	62 (53.00)	8 (6.80)		57 (48.70)	60 (51.30)		20 (5-26)	
University and above	49 (37.40)	66 (50.40)	16 (12.20)		51 (38.90)	80 (61.10)		21 (1-28)[1]	
Tobacco use				<0.001			0.207		0.193***
Yes	14 (11.10)	78 (61.90)	34 (27.0)		69 (54.80)	57 (45.20)		20 (7-27)	
No	157 (58.40)	104 (38.70)	8 (3.00)		129 (48.00)	140 (52.00)		21 (1-28)	
Employment status				0.051			0.002		0.049***
Yes	69 (37.10)	97 (52.20)	20 (10.80)		78 (41.90)	108 (58.10)		20 (1-28)	
No	102 (48.80)	85 (40.70)	22 (10.50)		120 (57.40)	89 (42.60)		20 (5-26)	
Household income status				0.186			<0.001		0.002**
Monthly income < expenses	56 (40.90)	61 (44.50)	20 (14.60)		91 (66.40)	46 (33.60)		19 (5-27)[1]	
Monthly income = expenses	92 (46.90)	90 (45.90)	14 (7.10)		90 (45.90)	106 (54.10)		20 (1-28)	
Monthly income > expenses	23 (37.10)	21 (50.00)	8 (12.90)		17 (27.40)	45 (72.60)		20.5 (9-27)	
Health insurance coverage				0.501			0.012		0.519***
Yes	153 (43.00)	163 (45.80)	40 (11.2)		171 (48.00)	185 (52.00)		20 (1-28)	
No	18 (46.20)	19 (48.70)	2 (5.10)		27 (69.20)	12 (30.80)		21 (7-26)	
Exercise habits				0.383			<0.001		0.042**
Never exercises	58 (42.30)	60 (43.80)	19 (13.90)		84 (61.30)	53 (38.70)		20 (1-27)	
Occasionally exercises	97 (44.70)	99 (45.60)	21 (9.70)		104 (47.90)	113 (52.10)		21 (7-27)	
Regularly exercises	16 (39.00)	23 (56.10)	2 (4.90)		10 (24.40)	31 (75.60)		21 (5-28)	

*: Chi-Square Test, row percentages are given; **: Kruskal-Wallis Test; ***: Mann-Whitney U Test; 1: Significant group difference; BMI: Body Mass Index; CARRF-KL: Cardiovascular Disease Risk Factors Knowledge Level; SCORE2: Systematic Coronary Risk Evaluation 2; WHO-5: The World Health Organization-Five Well-Being Index.

Table 3. Comparison of SCORE2 risk status and CARRF-KL scores

SCORE2 risk categories	CARRF-KL score Median (min–max)	p*
Low-medium risk	20 (5-28)	
High risk	20 (1-27)	0.480
Very high risk	19 (8-27)	

*: Kruskal Wallis Test; CARRF-KL: Cardiovascular Disease Risk Factors Knowledge Level, SCORE2: Systematic Coronary Risk Evaluation 2.

consume alcohol (p<0.001). A significant difference was found between university graduates and those with only primary education; individuals with lower education levels had a higher CVD risk (p<0.001) (Table 2).

According to the CARRF-KL scale, men and university graduates had higher knowledge levels, while individuals with lower income and those who do not exercise had lower knowledge levels (p<0.05) (Table 2).

The mean score of participants on the WHO-5 Well-Being Index was 12.02±5.01, and 50.1% reported low mental well-being. The proportion of individuals with low mental well-being was significantly higher among women (p<0.001), unmarried individuals (p=0.007), those with only primary education (p=0.001), individuals with low income (p<0.001), and those who did not exercise (p<0.001) (Table 2).

The relationship between SCORE2, mental well-being, and CVD knowledge level was evaluated. When comparing the SCORE2 risk status with the CARRF-KL knowledge level, the average CARRF-KL scores of individuals in the low-moderate and high-risk groups were similar, while individuals in the very high-risk group had slightly lower knowledge levels. However, the difference between the groups was not statistically significant (p=0.480) (Table 3).

When comparing SCORE2 risk with WHO-5 mental well-being, individuals in the high and very high-risk groups were more likely to report lower mental well-being. However, this difference was not statistically significant (p=0.686) (Table 4).

When examining the relationship between WHO-5 mental well-being and CARRF KL knowledge level, individuals reporting good mental well-being had significantly higher CARRF-KL scores (p=0.042) (Table 5).

These findings suggest that cardiovascular disease risk is not directly related to knowledge level, but there may be a positive relationship between mental well-being and CVD knowledge level.

During the pandemic, individuals who postponed medical appointments had lower mental well-being (p=0.007).

Table 4. Comparison of SCORE2 risk status and WHO-5 well-being status

	WHO-5 Well-Being category		
SCORE2 risk categories	Poor (%)	Good (%)	p*
Low-medium risk	82 (48.00)	89 (52.00)	
High risk	93 (51.10)	89 (48.90)	0.686
Very high risk	23 (54.80)	19 (45.20)	

*: Chi-Square Test, Row percentages are given; SCORE2: Systematic Coronary Risk Evaluation 2; WHO-5: The World Health Organization-Five Well-Being Index.

Table 5. Comparison of WHO-5 Well-Being status and CARRF-KL scores

WHO-5 Well-Being category	CARRF-KL score Median (IQR 25–75)	p*
Good	20 (18-24)	0.042
Poor	20 (17-23)	

*: Mann-Whitney U Test; IQR: Interquartile range; CARRF-KL: Cardiovascular Disease Risk Factors Knowledge Level; WHO-5: The World Health Organization-Five Well-Being Index.

49% of individuals who had COVID-19 were in the low-moderate risk group, while 45.8% of those who did not have COVID-19 were in the high-risk group (p=0.037).

Individuals who exercised had both higher mental well-being and higher CVD knowledge levels (p<0.05).

Discussion

In this study, the CVD risk levels calculated by SCORE2 for individuals aged 40-65, their knowledge of CVD risk factors (CARRF-KL), and their well-being (WHO-5) were evaluated, and the relationships of these variables with sociodemographic factors were examined. Additionally, the impact of the COVID-19 pandemic on cardiovascular health management was investigated. The findings indicate that the COVID-19 pandemic has led to significant changes in health perceptions, particularly in individuals' access to healthcare services.

In our study, participants' CVD risk was calculated using the SCORE2 algorithm, and it was determined that 46.1% were in the high-risk category, while 10.6% were in the very high-risk category. A significant increase in CVD risk level with age was observed (p<0.001). This finding aligns with the other research.[12,13] The impact of advanced age on CVD may be explained by the progression of conditions such as atherosclerosis development and hypertension, which increase with age.

When analyzed by gender, males were significantly more prevalent in the high- and very high-risk groups (p<0.001).

This outcome can be attributed to hormonal and metabolic differences in males, as highlighted in the literature.[14] The earlier onset of CVD in males may be associated with unhealthy lifestyle habits and biological factors.

Regarding education level, primary school graduates constituted a larger proportion among high-risk individuals (p<0.001). This result is consistent with studies suggesting that lower education levels may negatively impact awareness of CVD risk factors.[15,16] A lower education level may lead to reduced health literacy and hinder the adoption of healthy lifestyle habits. Similarly, individuals who smoked had a significantly higher risk (p<0.001). The harmful effect of smoking on blood vessel structure accelerates the development of atherosclerosis, thereby increasing CVD risk.[17]

Looking at the effects of the pandemic, 36.5% of participants reported postponing medical appointments during this period. The most common reasons cited were fear of contagion (72.9%) and difficulty accessing healthcare services (37.5%). Similar findings have been observed in other studies, which indicate disruptions in chronic disease management during the pandemic.[18,19] The pandemic period, with healthcare systems focusing on COVID-19, led to disruptions in the management of chronic diseases. This situation may have caused individuals with chronic illnesses to skip health check-ups, potentially leading to the progression of their conditions.

When examining individuals who had contracted COVID-19, it was found that 49% were in the low-medium risk group, while 45.8% were in the high-risk group (p=0.037). This finding contrasts with some studies that suggest COVID-19 increases CVD risk.[20,21] In our study, the younger age group of participants who had contracted COVID-19 could explain why they were at a lower risk. Additionally, younger individuals tend to recover more quickly from COVID-19 and return to healthier lifestyle habits sooner.

During the pandemic, individuals who visited the emergency department were found to have significantly lower mental well-being (p<0.001). This result is consistent with studies highlighting the mental health impacts of COVID-19.[22,23] The uncertainty, social isolation, and economic challenges caused by COVID-19 have had a negative effect on individuals' mental health. Additionally, the difficulty in accessing healthcare services during this period suggests that individuals with poorer mental well-being require more health support.

Mental well-being, according to the WHO-5 scale, 50.1% of participants reported low mental well-being. Mental well-being was found to be significantly lower in women, unmarried individuals, and those in lower-income groups (p<0.001). These findings are consistent with other studies examining the mental health impacts of the pandemic.[24,25] The pandemic has affected mental well-being more significantly in vulnerable groups, due to factors such as a lack of social support and increased stress.

Individuals who engage in regular exercise have significantly higher mental well-being and CVD knowledge levels (p<0.05). Regular physical activity helps maintain physical health and supports mental well-being by increasing endorphin levels.[26,27] Therefore, it can be said that individuals who exercise are healthier both physically and mentally.

In terms of CVD knowledge level assessed using the CARRF-KL scale, men and individuals with higher education levels had significantly higher knowledge levels (p=0.027, p<0.001). This finding is consistent with the literature showing that education and awareness play a critical role in CVD risk management.[28,29] Individuals with higher knowledge levels are more conscious about disease prevention and early diagnosis, and thus make more effective use of healthcare services.

There was no statistically significant relationship between SCORE2 risk level and CVD knowledge level (p=0.480). Similarly, studies conducted with previous SCORE and Framingham scores also show that knowledge level does not directly affect CVD risk.[28–30] This suggests that having knowledge without behavioral change is insufficient and that this knowledge needs to be translated into behavior.

When the SCORE2 risk status is compared with the CARRF-KL knowledge levels, it was found that the average CARRF-KL scores of individuals in the low-medium and high-risk groups were similar, but those in the very high-risk group had relatively lower knowledge levels. Although this difference was not statistically significant (p=0.480), it demonstrates that a high level of knowledge does not directly reduce individuals' CVD risk. This finding suggests that knowledge may be confined to raising awareness, but without being translated into behavioral change, a significant reduction in CVD risk cannot be achieved.

Previous studies have also shown that while CVD knowledge levels are associated with healthy lifestyle habits, knowledge alone is insufficient to reduce CVD risk factors.[28–30] Behavioral factors such as tobacco and tobacco product use, unhealthy dietary habits, and physical inactivity increase CVD risk regardless of an individual's knowledge level. Therefore, programs aimed at improving knowledge should also focus on promoting behavioral change.

These results highlight that CVD risk management requires consideration not only of individual knowledge levels but also of environmental and socioeconomic factors. In particular, the lower CARRF-KL scores in individuals with low-income levels highlight the need for CVD prevention strategies to include more targeted interventions for the disadvantaged segments of society.

In our study, individuals with diabetes were not included in the study in accordance with the design of the SCORE2 algorithm. This restricts the generalizability of findings to populations with high diabetes prevalence. However, this limitation reflects clinical reality: diabetic patients are already classified as high-risk per guidelines, requiring intensive preventive interventions, and should be evaluated using diabetes-specific tools. Future studies could improve risk prediction accuracy by developing models that integrate diabetes status and duration.[12]

Limitations

The most significant limitation of this study is that it was conducted as a single-center study with individuals who only visited the cardiology outpatient clinic. Another limitation is that the data obtained from the questionnaires and scales in the study were based on the participants' self-reports.

A key limitation is the inability to assess risk profiles in diabetic individuals due to their exclusion in the SCORE2 algorithm. While diabetes is an independent cardiovascular risk factor, our results are not directly generalizable to this population. This aligns with ESC guideline recommendations and underscores the need for complementary diabetes-specific risk assessment tools.

Conclusion

In this study, it was determined that age, gender, education level, tobacco use, exercise status, and economic factors are associated with CVD risk level, mental well-being, and CVD knowledge level. It was observed that the pandemic negatively affected access to healthcare services and individuals' mental well-being.

Additionally, it was observed that a higher level of knowledge about CVD risk factors might support healthier lifestyle habits but does not directly reduce CVD risk. When comparing SCORE2 risk status with CARRF-KL knowledge level, the lack of a significant relationship between knowledge level and CVD risk score (p=0.480) indicates that having knowledge alone is not sufficient to reduce CVD risk and that this knowledge must be supported by behavior change.

It is suggested to expand screening and risk assessment programs for CVD prevention, allowing for the identification of individuals, especially in the high and very high-risk groups, and focusing on these groups in preventive healthcare services.

National screening programs for CVD risk status should be developed to increase early diagnosis rates.

Multicenter studies covering larger populations can be conducted using the SCORE2 system recommended by ESC and the Turkish Society of Cardiology, and CVD risk prediction models can be updated according to the characteristics of the population.

Based on these findings, it is important to expand educational programs aimed at increasing CVD awareness and community-based prevention strategies. Additionally, policies should be developed to facilitate access to healthcare services during the pandemic, and interventions to support mental health should be increased.

Ethics Committee Approval: The Gülhane Training and Research Hospital Clinical Research Ethics Committee granted approval for this study (date: 28.04.2021, number: 2021/14).

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