

Assessment of secondary prevention awareness among patients with coronary artery disease: A survey including patients from 3 centers

Koroner arter hastalığı olan hastalarda ikincil korunma farkındalığının değerlendirilmesi: Üç merkezden hastaları içeren bir anket çalışması

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ABSTRACT

Objective: In this study, we aimed to investigate the awareness of patients with coronary artery disease (CAD) about secondary prevention and the channels through which they obtained information on this issue.

Methods: A standard questionnaire including 45 questions was given to the patients (n=912) who were admitted to the cardiology outpatient clinics to investigate their secondary prevention awareness and lifestyle.

Results: Of the participants, 508 (55.7%) stated that they knew the condition of their vessels after coronary angiography; 493 (54.1%) stated that they did not exercise; 299 stated that they did not follow any specific diet. Men were more frequently aware of all risk factors except diet, blood glucose, and blood pressure compared to women (p<0.001). Women were more frequently aware that blood glucose and blood pressure are risk factors for CAD compared to men (p<0.001). The high-income patient group was more aware of all the risk factors, except blood glucose compared to the low/medium income patient group (p<0.001). The frequency of awareness, except for blood glucose and antiplatelet drugs, increased as the education level increased (p<0.001). However, the frequency of awareness of blood glucose and antiplatelet drug use was higher in the literate/elementary school/secondary school group (p<0.001). In addition, it was concluded that patients' sexual life and psychological problems after being diagnosed with the disease were rarely questioned by cardiology specialists.

Conclusion: Awareness of patients with CAD about secondary prevention was found to be very low.

ÖZET

Amaç: Bu çalışmada koroner arter hastalarının ikincil korunma konusunda farkındalıkları ve bu konuda bilgileri hangi kanallar aracılığı edindikleri araştırılmıştır.

Yöntemler: Kardiyoloji polikliniğine ardışık olarak başvuran koroner arter hastalarına (n=912) 45 soruluk bir anket uygulanmıştır.

Bulgular: Katılımcıların 508'i (%55.7) koroner anjiyografi sonrası damarlarının durumunu bildiğini belirtti. Katılımcıların 493'ü hiç egzersiz yapmadığını belirtmiştir (%54.1). Katılımcıların 299'u herhangi bir diyet yapmadığını belirtmiştir. Erkekler kadınlarla karşılaştırıldığında diyet, kan şekeri ve kan basıncı dışındaki risk faktörlerinin daha sık farkındadır (p<0.001). Kadınlar erkeklerle karşılaştırıldığında kan şekeri ve kan basıncının risk faktörü olduğunun daha sık farkındadır (p<0.001). Yüksek gelirli hasta grubu, düşük/orta gelirli hasta grubuna göre kan şekeri dışındaki tüm risk faktörlerinin daha fazla farkındadır (p<0.001). Eğitim düzeyi arttıkça kan şekeri ve anti-trombositler ilaç farkındalık sıklığı artmaktadır (p<0.001). Öte yandan okuryazar/ilkokul/orta-okul grubunda kan şekeri ve anti-trombositler ilaç konusunda farkındalık sıklığı daha yüksektir (p<0.001). Ayrıca, hastaların cinsel yaşamı ve psikolojik sorunlarının kardiyoloji uzmanları tarafından nadiren sorgulandığı görülmüştür.

Sonuç: Koroner arter hastalarının ikincil korunma konusunda farkındalıkları çok düşük bulunmuştur.

Despite significant reduction in cardiovascular disease (CVD) mortality in the recent years, coronary artery disease (CAD) is still one of the most important causes of mortality worldwide.^[1] Although the development of treatment methods helps in de-

creasing mortality rates, prevention is the cornerstone in the fight against CAD.^[2] Prevention is always a cheaper and more effective approach compared with administration of treatment. A survey from the United Kingdom reported that reducing cardiovascular



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risk of the population by 1% would offer savings of £40 million/year and prevent 25,000 CAD cases.^[3] Although the importance of secondary prevention is evident, the question is whether sufficient awareness has been created among the patients. Previous studies showed that patients' awareness of secondary prevention is very low.^[1,4-6]

In this study, we questioned factors affecting this awareness and evaluated whether there was an increase in public awareness on this matter compared with earlier studies. In addition, the concerns of patients with CAD with respect to their sexual life, psychological conditions, and illnesses were addressed, and their possible influences on secondary prevention were investigated.

METHODS

This study was conducted as a cross-sectional study in 2 tertiary-level hospitals and one secondary-level hospital in 3 different regional territories of Turkey, from April to May 2018. A total of 912 patients with CAD history (355 from Eskişehir State Hospital, 305 from Çanakkale Onsekiz Mart University Hospital, and 252 from İzmir Selçuk State Hospital) were included in the analyses.

Approval was received from the Clinical Researches Ethics Committee of Çanakkale Onsekiz Mart University (Approval Date: January 24, 2018; Approval Number: 02-02) for the conduct of the study.

Selection of patients

The study included patients who were previously diagnosed with CAD and who received medical treatment. For this study, CAD was defined as the detection of any plaque in the coronary vessels by means of coronary angiography (CAG) and having received medical therapy or having undergone intervention or coronary artery bypass graft (CABG). Those who did not undergo CAG, patients in whom CAD was ruled out with CAG, individuals who were younger than 18 years, and patients who were mentally or physically incapable of understanding or answering the questions in the questionnaire were excluded from the study.

Data collection and questionnaire preparation

A standardized questionnaire was given to patients consecutively diagnosed with CAD at the cardiol-

ogy outpatient clinic of the 3 hospitals. The cardiology specialists who carried out this study created the items in the questionnaire according to published guidelines pertaining to secondary prevention

and other studies on this topic. The final form of the questionnaire was obtained after its initial form was given to 10 cardiologists working in different centers who evaluated and corrected the items. All items and data were then transferred online. The questionnaire included queries about demographic information of the patients, comorbid diseases (diabetes mellitus [DM], hypertension [HT], hyperlipidemia, etc.), psychological status (depression and anxiety), medical therapies, exercise, diet, herbal therapy, and sexual life. Previous studies on this subject were examined when preparing the survey. It was observed that the researchers asked questions that they deemed valuable for their patient population, and each question was evaluated independently from other questionnaire questions. This questionnaire was not administered to determine a total score or to come to a single result from the answers in the questionnaire, we aimed to evaluate each question within itself. Each question we used in the study was taken from previous studies, and the reliability of the questions in detecting the problem was questioned by comparing them with the European and US guidelines on this issue. After this questionnaire was handed to the patients, they were asked to fill it in a separate room by themselves. Cardiologists conducting the study assisted patients who had difficulty answering the questions alone; this group was defined as "non-educated literate" individuals. In any patient whose literacy was not sufficient to complete the questionnaire, the form was filled out in a face-to-face manner by a researcher, and these patients were defined as "non-educated illiterate." A total of 1000 questionnaires were distributed for the study, and 912 forms were collected. The questionnaire is presented as Supplementary Table 1.

The patients were verbally informed about the study, and an informed consent form was signed. No personal data were present in the questionnaires.

Abbreviations:

<i>BMI</i>	<i>Body mass index</i>
<i>CABG</i>	<i>Coronary artery bypass graft</i>
<i>CAD</i>	<i>Coronary artery disease</i>
<i>CAG</i>	<i>Coronary angiography</i>
<i>CVD</i>	<i>Cardiovascular disease</i>
<i>DM</i>	<i>Diabetes mellitus</i>
<i>EUROASPIRE</i>	<i>European Action on Secondary and Primary Prevention by Intervention to Reduce Events</i>
<i>HT</i>	<i>Hypertension</i>
<i>LDL</i>	<i>Low-density lipoprotein</i>

Table 1. Summary of patient characteristics

Variable	Frequency (n)	Percentage (%)
Income		
Low	104	11.4
Medium	643	70.5
High	165	18.1
Marital status		
Married	837	91.8
Single	15	1.6
Widowed/divorced	60	6.6
Education		
Non-educated illiterate	89	9.8
Non-educated literate	59	6.5
Elementary school	435	47.7
Secondary school	120	13.2
High school	179	19.6
University	30	3.3
Residence		
Province	402	44.1
District	345	37.8
Town	150	16.4
Village	15	1.6
Concomitant diseases		
Hypertension	450	49.3
Diabetes mellitus	224	24.6
Hyperlipidemia	463	50.8
Congestive heart failure	210	23.0
Cerebrovascular disease	105	11.5
Medication		
Antiplatelet	763	83.7
Statin	330	36.2
Results of coronary angiography		
1 vessel disease	627	68.8
2 vessel disease	240	26.3
>2 vessel disease	45	4.9
Stent placed	493	54.1
Coronary artery bypass graft operation	180	19.7

Data are expressed as frequency or percentage.

Each question was evaluated considering the number of specific answers given. After all the questionnaires were collected in one center, the data were transferred online.

Questionnaire for determination of patient awareness

It is accepted that patients who answered “YES” to the following questions were aware of the factors emphasized in **bold**:

“Did you know that a **plaque** (fat accumulation that causes the most common obstruction of the heart vessel) detected in coronary angiography could cause a sudden heart attack?”

“Do you know that the **body mass index**, calculated with height and weight, is a crucial factor in cardiovascular disease progression?”

“Do you know that keeping your **waist circumference** value below a certain value is very important for the progression of cardiovascular disease?”

“Do you know that reasonable **exercise** is a very important positive factor in the progression of cardiovascular disease?”

“Do you know that continuing to **smoke** will worsen your cardiovascular disease?”

“Do you know that **proper diet** is very important for the progression of heart disease?”

“Do you know that keeping **blood sugar** in a normal range is very important to prevent cardiovascular disease?”

“Do you know that **normal blood pressure** is very important to prevent cardiovascular disease?”

“Do you know that low levels of **LDL, particularly referred to as malignant cholesterol**, is very important for the progression of your cardiovascular disease?”

“Do you know that, in the absence of any side-effects, **antiplatelet drugs** will be taken regularly and daily for the rest of your life?”

“Do you know that when **cholesterol pills** are ceased or not used at adequate doses, your heart disease will progress rapidly, which could threaten your life?”

“Do you know that **sexual enhancement drugs**, especially sildenafil and its derivatives, should not be used with certain drugs that relieve your chest pain?”

Statistical analysis

The SPSS version 20 (IBM Corp., Armonk, NY, USA) software was used to analyze the data. Categorical variables were expressed as count and per-

cent. Categorical variables were evaluated using the Pearson's chi-squared test or the Fisher's exact test. The significance level was set at 0.05 for all comparisons.

RESULTS

A total of 912 volunteers participated in the study, of whom 358 (39.3%) were women, and 837 (91.8%) had at least 1 child. The mean age was 63 ± 12 years. Sociodemographic information and chronic diseases of the patients are shown in Table 1.

All the patients participating in the study underwent CAG previously, but 44 (4.8%) were not aware that they had undergone CAG. Among the group, 508 (55.7%) stated that they knew the condition of their vessels after CAG; others either did not know or did not remember. Of note, 120 (13.2%) participants were aware of their body mass index (BMI) and the importance of BMI, and all of them (100%) stated that they learned this from their doctor or healthcare professionals. Although 375 (41.1%) participants were not prescribed any treatment by their physician, they used non-drug herbal treatment (Table 2).

Of the participants, 493 (54.1%) stated that they did not do any exercise, and 299 (33.3%) stated that they did not adhere to any specific diets. Summary of patients' heart disease-related behavior are shown in Table 3.

When the time to sexual intercourse after the intervention was examined, it was 3 to 7 days in 208 (43.2%) of the CAG plus elective percutaneous coro-

nary intervention group, 2 to 4 weeks in 130 (46.1%) of the heart attack group, and >6 weeks in 81 (59.3%) of the CABG group (Table 4).

The most common source of advice was "their own doctor" (60.7%) for those who quit smoking after a definitive diagnosis. The use of sexual enhancement drugs or herbal derivatives was suggested by "someone who is not a healthcare professional" in 60.3% of the patients (Table 5).

The frequency of awareness of the patients about cardiovascular risk factors, such as plaque formation in the vessels, BMI, exercise, smoking, diet, blood glucose, blood pressure, low-density lipoprotein (LDL)/malignant cholesterol level, and use of anti-platelet drugs/cholesterol pills/sexual enhancer drugs that relieve chest pain are shown in Table 6.

Herbal medicine was used by 75 (41.9%) high school graduates, 30 (25.0%) secondary school graduates, 165 (37.9%) elementary school graduates, 45 (76.3%) non-educated literate participants, and 60 (67.4%) non-educated illiterate participants. There was a significant relationship between the use of non-drug herbal therapy and education ($p < 0.001$) (Figure 1).

When the relationship between educational status and exercise was analyzed, none of the university graduates, 60 (33.7%) high school graduates, 60 (50.0%) secondary school graduates, 300 (69.0%) elementary school graduates, 30 (50.0%) non-educated literate participants, and 74 (83.1%) non-educated illiterate participants stated that they did not exercise. There was a significant relationship between exercise and education ($p < 0.001$). A total of 44 (24.6%) high school graduates, 75 (62.5%) secondary school graduates, 135 (31.0%) primary school graduates, and 45 (60.0%) illiterate participants stated that they did not adhere to any specific diet. There was a significant relationship between education and diet awareness ($p < 0.001$). Men were more frequently aware of all the risk factors except diet, blood glucose, and blood pressure compared with women ($p < 0.001$). Women were more frequently aware that blood glucose and blood pressure were risk factors for CVD compared with men ($p < 0.001$). The high-income patient group was more aware of all the CVD risk factors, except for blood glucose, compared with the low/medium income patient group ($p < 0.001$). The frequency of awareness of all the risk factors, except for blood

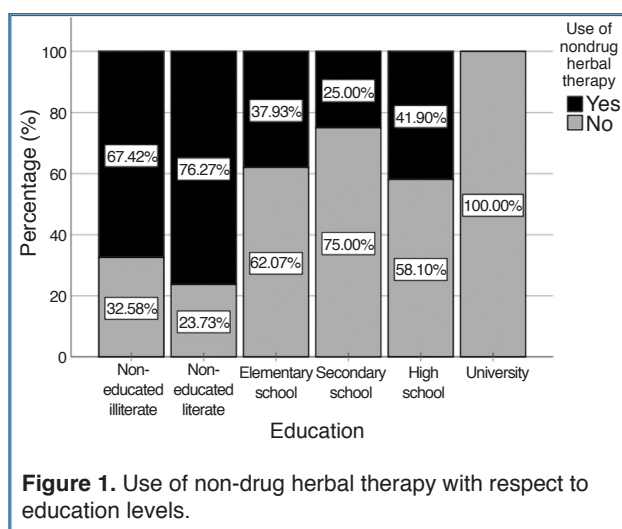


Table 2. Summary of the answers to the dichotomous questions of the questionnaire

Questions	Yes
Have you undergone coronary angiography?	868 (95.2)
Were you able to learn the condition of your vessels after coronary angiography?	508 (55.7)
Did you know that a plaque (fat accumulation that causes the most common obstruction of the heart vessel) detected in coronary angiography could cause sudden heart attack?	89 (9.8)
Does your chest pain occasionally occur?	466 (51.0)
Do you know your height?	659 (72.3)
Do you know your weight?	763 (83.7)
Do you know that the body mass index, calculated with height and weight, is a crucial factor in CVD progression?	120 (13.2)
Do you know your waist circumference?	30 (3.3)
Do you know that keeping your waist circumference value below a certain value is very important in the progression of CVD?	120 (13.2)
Do you know that reasonable exercise is a very important positive factor in the progression of cardiovascular disease?	375 (41.1)
Have you smoked or used a tobacco product (pipe, cigar, hookah, etc.) throughout your life?	659 (72.3)
Do you know that continuing to smoke will worsen your CVD?	794 (87.0)
Do you drink alcohol?	255 (28.0)
Do you know that proper diet is very important for the progression of heart disease?	704 (77.2)
Do you have diabetes?	269 (29.5)
Do you know that keeping blood sugar in a normal range is very important to prevent CVD? (n=852)	165 (19.3)
Do you have hypertension?	598 (65.5)
Do you know that normal blood pressure range is very important to prevent cardiovascular disease? (n=882)	405 (45.9)
Do you have high cholesterol?	464 (50.9)
Do you know that low levels of LDL, particularly referred to as malignant cholesterol, is very important for the progression of your CVD?	165 (18.1)
Have you had symptoms such as fear of death, lack of joy, decreased personal care, neglect of situations or people that you care for, disruption of eating habits or sleep patterns after heart attack, angiography, or heart surgery? (n=868)	510 (58.7)
Did you share this information with your physician? (n=495)	90 (18.1)
Do you take an antiplatelet drug (aspirin, clopidogrel, prasugrel, ticagrelor) every day? (n=898)	779 (86.7)
Do you know that, in the absence of any side effects, antiplatelet drugs will be taken regularly and daily for the rest of your life? (n=853)	719 (80.1)
Do you take pills for cholesterol/hyperlipidemia?	404 (84.2)
Do you know that when cholesterol pills are ceased or not used at adequate doses, your heart disease will progress rapidly, which could threaten your life? (n=897)	225 (44.3)
Do you use a drug or herbal derivative that increases sexual performance? (n=852)	315 (36.9)
Do you know that sexual enhancement drugs, especially sildenafil and its derivatives, should not be used with certain drugs that relieve your chest pain? (n=465)	105 (22.5)
Have you used a non-drug treatment method, especially any herbal product, for your heart disease?	375 (41.1)

Data are expressed as frequency (percentage). Percentages were calculated among those who answered the question. In questions without response count (n), all the participants had answered the question (n=912).
CVD: cardiovascular disease; LDL: low-density lipoprotein.

Table 3. Summary of patients' heart disease-related behavior

Questions and answers	Frequency (n)	Percentage (%)
What exercises do you perform? (n=912)		
Walking at a slow pace	314	34.4
Walking at a fast pace	105	11.5
Do not perform any exercises	493	54.1
What kind of diet do you adhere to? (n=898)		
Low-sugar diet	344	38.3
Vegetable and fruit-based diet	165	18.4
Low-fat diet	90	10.0
None	299	33.3
Why didn't you share your "post heart attack, angiography, or heart surgery symptoms" information with your doctor? (n=449)		
I thought my doctor would not be interested because she/he was a cardiologist.	135	30.0
Because of my heart problems, it was not time to talk about these problems.	59	13.1
As the doctor's outpatient clinic was very intense, there was no time to explain my extra heart problems.	210	46.7
I talked to a psychiatrist.	45	10.0

Data are expressed as frequency or percentage.

Table 4. Sexual intercourse starting day according to the intervention type

Time	CAG plus elective PCI	Heart attack	CABG	Total
No response	27	72	66	165
3-7 days	208	0	0	208
1-2 weeks	180	30	0	210
2-4 weeks	35	130	0	165
4-6 weeks	0	28	2	30
Others (>6 weeks)	31	22	81	134
Total	481	282	149	912

Data are expressed as frequency.

CABG: coronary artery bypass graft; CAG: coronary angiography; PCI: percutaneous coronary intervention.

glucose and antiplatelet drug awareness, increased in parallel with increasing level of education ($p < 0.001$). However, frequency of blood glucose and antiplatelet drug use awareness was higher in the non-educated literate/elementary school/secondary school group ($p < 0.001$) (Table 7).

DISCUSSION

This study showed that the awareness of secondary prevention measures among patients with CAD and their compliance were low. Considering the results obtained, it was thought that the reason for the low level of awareness and knowledge about secondary

prevention might be owing to the fact that a considerable percentage of participants obtained their knowledge from channels other than health professionals.

Although secondary prevention is an important subject emphasized by physicians, raising awareness among the patients has not been successful; and therefore, patients' compliance to preventive measures has not been optimum.^[4] Many studies have shown that the recommendations of guidelines for secondary prevention are far from practical.^[7,8] We believe that the first condition for raising awareness among patients in terms of secondary prevention is to identify comorbidities and medications used. For example, in a study

Table 5. Source of advice on patient behaviors

Patients' behaviors	Source of advice				
	A	B	C	D	E
Quitting smoking after definitive diagnosis (n=494)	300 (60.7)	-	194 (39.3)	-	-
Duration of sexual intercourse avoidance after cardiologic event* (n=733)	30 (4.0)	45 (6.1)	15 (2.0)	15 (2.0)	628 (85.6)
Using sexual performance enhancement drug or herbal derivatives (n=315)	25 (7.9)	190 (60.3)	70 (22.2)	30 (9.5)	-
Using non-drug treatments for heart disease (n=375)	-	195 (52.0)	30 (8.0)	150 (40.0)	-

*Cardiologic event: Heart attack, angiography or coronary bypass surgery.

Data are expressed as frequency (percentage). The source of advice among patients practicing the relevant behavior is shown.

A: my doctor; B: someone who is not a healthcare professional; C: media; D: internet health portals; E: my own decision.

Table 6. Factors thought to be important in preventing cardiovascular diseases

Factors	Source of information				
	A	B	C	D	E
Body mass index (n=120)	-	30 (25.0)	75 (62.5)	15 (12.5)	-
Exercise (n=375)	75 (20.0)	45 (12.0)	90 (24.0)	30 (8.0)	135 (36.0)
Smoking (n=794)	269 (33.8)	-	435 (54.7)	15 (1.8)	75 (9.4)
Diet (n=704)	135 (19.1)	30 (4.2)	344 (48.8)	75 (10.6)	120 (17.0)
Blood glucose (n=165)	60 (36.3)	-	105 (63.7)	-	-
Blood pressure (n=405)	60 (12.8)	-	210 (51.8)	45 (11.1)	90 (22.2)

Data are given as frequency (percentage). The source of information is shown among the cases that consider the relevant factor important.

A: my doctor; B: someone who is not a healthcare professional; C: printed or visual media; D: internet health portals; E: social media.

performed by Ozkan et al.,^[11] a comparison was made between patients with CAD who knew the name of their statin medication and those who did not know, and it was found that the group who knew the name of the statin drug had lower levels of LDL and had higher compliance to treatment. In our study, it was concluded that only 55% of patients were able to obtain information about the state of their vessels after CAG. Approximately half of the remaining patients either did not receive any information from their doctor or did not remember whether they had been informed, possibly because they were not aware of the importance of such information. In addition, more than 90% of the patients were unaware that CAD develops as a result of occlusion of the heart vessels in relation with a plaque. Among patients who are unaware of CAD or did not know that it was associated with blood vessels, it would be erroneous to expect perception of the fact that they had a chronic disease which requires compliance to lifelong therapy.

Increased BMI is a well-known risk factor for CAD; therefore, losing excess weight is very important

in the prevention of progression in patients with CAD.^[9] A study showed that only 35.5% of obese patients recognized that obesity was a risk factor.^[10] Therefore, it is important to teach patients what obesity is and to remind them that it is considered a risk factor. In this study, we found that an alarmingly high proportion of patients were oblivious to the risks associated with obesity as demonstrated by the fact that 86.6% of the patients were not aware that increased BMI values posed a risk for heart disease. In addition, some patients did not know their height or weight. Many participants stated that they were not checking their weight regularly. More importantly, nearly half of those who knew the importance of BMI said they learned this information from the media (social and visual).

When the answers to questions detailing patients' awareness about waist circumference value were assessed, our results revealed that patients were either dismissive of the importance of this parameter, or they had not been informed about this matter. Waist circumference is defined as an important indicator

Table 7. Awareness of cardiovascular risk factors by sex, income, and education

Factors that patients are aware of	Sex		<i>p</i> *	Income		<i>p</i> *	Education			<i>p</i> *
	Female (n=358)	Male (n=554)		Low/medium (n=747)	High (n=165)		Non-educated illiterate (n=89)	Non-educated literate/secondary school (n=614)	High school/university (n=209)	
Plaque in angiography	-	89 (16.1)	<0.001	59 (7.9)	30 (18.2)	<0.001	-	45 (7.3)	44 (12.1)	<0.001
Body mass index	15 (4.2)	105 (19.0)	<0.001	60 (8.0)	60 (36.4)	<0.001	-	75 (12.2)	45 (21.5)	<0.001
Waist circumference	15 (4.2)	105 (19.0)	<0.001	60 (8.0)	60 (36.4)	<0.001	-	75 (12.2)	45 (21.5)	<0.001
Exercise	75 (20.9)	300 (54.2)	<0.001	255 (34.1)	120 (72.7)	<0.001	-	195 (31.8)	180 (86.1)	<0.001
Smoking	269 (75.1)	524 (94.6)	<0.001	628 (84.1)	165 (100.0)	<0.001	74 (83.1)	510 (83.1)	209 (100.0)	<0.001
Diet	269 (75.1)	435 (78.5)	0.235	539 (72.2)	165 (100.0)	<0.001	44 (49.4)	480 (78.2)	180 (86.1)	<0.001
Blood glucose	120 (33.5)	45 (8.1)	<0.001	135 (18.1)	30 (18.2)	0.347	15 (16.9)	150 (24.4)	-	<0.001
Blood pressure	165 (46.1)	240 (43.3)	<0.001	330 (44.2)	75 (45.5)	<0.001	30 (33.7)	225 (36.6)	150 (71.8)	<0.001
LDL/malignant cholesterol	15 (4.2)	150 (27.1)	<0.001	120 (16.1)	45 (27.3)	0.001	-	105 (17.1)	60 (28.7)	<0.001
Antiplatelet medication	254 (73.8)	465 (83.9)	<0.001	559 (77.6)	159 (90.9)	<0.001	30 (40.0)	539 (87.8)	150 (71.8)	<0.001
Cholesterol medication	45 (12.6)	180 (32.5)	<0.001	180 (24.1)	45 (27.3)	0.143	-	150 (24.4)	75 (35.9)	<0.001
Sexual enhancement drugs used with drugs that relieve chest pain	-	105 (19.0)	<0.001	60 (8.3)	45 (27.3)	<0.001	-	60 (10.0)	45 (21.5)	<0.001

*The significance level was set at 0.05 for all comparisons.

Data are expressed as frequency (percentage). The percentage of participants who consider the variable as a risk factor is shown.

LDL: low-density lipoprotein.

of excess weight and metabolic syndrome.^[11] Being aware of waist circumference and trying to reduce it (if increased) can contribute positively to secondary prevention. It is concluded from our study that almost none of the patients were aware of their waist circumference value.

A sedentary lifestyle is the primary reason for developing CAD. Therefore, enhancing physical activity, independent of age, sex, and ethnicity, decreases risks and increases quality of life. Adults should perform at least 150 minutes of cumulative moderate-intensity aerobic physical activity or 75 minutes of high-intensity aerobic physical activity every week to reduce CAD risk.^[11] In the European Action on Secondary and Primary Prevention by Intervention to Reduce Events

(EUROASPIRE) III study, after developing coronary heart disease, 48.6% of patients in the Turkish group and 59.1% of patients in the European group increased their levels of physical exercise.^[12] In our study, more than half of the participants stated that they did not perform any form of exercise. Moreover, more than half did not have any information about the protective effect of exercise with regard to CVD. It can be concluded that the proportion of those who do not exercise and the ones who are not aware of the importance of exercising is approximately the same and that the importance of exercising is not adequately explained by healthcare professionals. A great majority of those who think that exercising is important also stated that they had gained this knowledge from the media (social and visual).

Smoking is a risk factor that can increase death rates due to CAD.^[13,14] Despite large-scale efforts, smokers have commonly reported that they are not aware that smoking puts their health at risk and that the risk of fatal myocardial infarction is 3 times higher in smokers than nonsmokers.^[15] In the EUREKA study, 21.3% of the European patient group were smokers; whereas in the Turkish group, this value was 23.7%.^[16] The EUROASPIRE II study indicated that 87.7% of patients had been smoking at the time of the index event, and 21% of patients continued to smoke.^[17] The EUROASPIRE III study showed that during the index event, 69.7% of all patients were smokers, and 17% of all patients continued smoking.^[14] A study conducted by Karthik et al.^[4] on patients with CAD stated that patients had relatively high awareness about smoking as a risk factor for CVD and concluded that the awareness rate was 53%. In our study, the awareness of the participants was quite high (87%). Compared with the previously mentioned study, the patients with CAD in our study were well informed about the harms of smoking and its relation to heart diseases. However, we noticed that the majority of patients had not acquired this information from their physician, but through the influence of social and visual media. In this study, it was observed that 21% of the participants continued to smoke after the index event.

Many epidemiological studies have shown that higher alcohol consumption is associated with higher overall mortality owing to cardiovascular causes. In this study, 72% of the patients did not drink alcohol at all.

The relationship between diet and CAD has been shown in many studies, and it has been shown that the consumption of fruit and vegetables decreases the risk of CVD.^[18,19] In our study, a very high proportion of the participants (77%) were aware of the effect of diet on CAD, and as a consequence, followed a healthy diet. However, the majority of the participants stated that they had obtained information pertaining to the importance of dietary recommendations from the media rather than physicians.

DM is one of the most important cardiovascular risk factors. In the EUREKA study, 24.4% of the participants in the European group had DM, and 31.4% of the Turkish group had DM.^[17] In the EUROASPIRE III study, 33.6% of the participants in the entire study

group had DM, whereas this value was 34.8% for the Turkish group.^[13] In this study, 29.5% of the participants had DM. In one study, the awareness of patients about DM was measured at 14.5%.^[4] In our study, the awareness of the participants in terms of blood sugar regulation was low (19.3%). It is known that the main educational channel for most patients in this regard is the social and visual media; and as this issue was not highlighted enough in the media, we believe the patients were less aware about it.

In the EUREKA study, 66.5% of the participants had HT in the Turkish group, whereas 72.7% of the entire study group had HT. Only 38.8% of those receiving HT treatment reached target blood pressure levels.^[16] In the EUROASPIRE II, EUROASPIRE III, and EUROASPIRE IV studies, after the index event, the percentages of patients with HT in the Turkish groups were 89.9%, 81.4%, and 75.2%, respectively. In the EUROASPIRE II and EUROASPIRE III studies, the percentages of patients receiving HT treatment without achievement of target blood pressure were 50% and 56%, respectively.^[18,19] In a similar study in which patients were investigated for HT awareness, 43% of subjects were described to be aware of its role^[4], whereas this value was 45.9% in our study. We noticed that patients' awareness about HT and achievement of target blood pressure levels in larger studies were similar. Therefore, increasing the awareness of patients appears to be as important as initiating the treatment for HT.

In multicenter studies conducted in Europe, it was revealed that the achievement of target cholesterol values (according to relevant guidelines) was very low in both European and Turkish groups.^[16,18] The percentage of statin use after diagnosis with CAD was 78.1% in the European group and 65% in the Turkish group.^[20] A study showed that only 62.3% of the patients diagnosed with CAD knew that hypercholesterolemia was a risk factor for CVD.^[4] In our study, only a small percentage of participants (18.1%) were aware that hypercholesterolemia was a cardiovascular risk factor. We think that this finding may be associated with anti-statin broadcasts on television in our country. This is supported by a previous study showing that anti-statin coverage in the media resulted in a decrease in the use of statins.^[21] Despite the lack of scientific support, we surmise that there are 2 reasons for the efficacy of such coverage. First, we believe that the

media is given an insufficient amount of information concerning preventive medicine practice, thus increasing the dominance of non-scientific arguments in circulation. Second, and perhaps more important, is the fact that healthcare professionals have a very limited time to persuade their patients to the contrary owing to extreme workload. Sexual intercourse after CAD diagnosis is an important issue that should be included in the approach to secondary prevention. Adequate information should be provided on subjects such as the time to start sexual intercourse and the interaction of sildenafil group of drugs and anti-ischemic drugs. Otherwise, problems that will result in mortality or morbidity may be encountered. We found that only 4% of the patients had received information from their physician about the duration of sexual intercourse avoidance after interventions or CAD-related events. Psychological risk factors, such as exhaustion, anxiety, and depressive symptoms, may impact the development of CAD through associated physiological responses and unhealthy behaviors that may give rise to clinical outcomes, including life threatening ventricular arrhythmias, myocardial ischemia, and increased risk for thrombosis.^[22] CAD can also cause symptoms such as depression, anxiety, and burnout. Therefore, the relationship between psychological disorders and CAD also needs to be evaluated with respect to their influence on secondary prevention. In our study, it was observed that 58.7% of the participants had symptoms of depression or anxiety. Moreover, it was seen that only half of the patients with these complaints shared them with their doctor. When asked why they did not share these complaints with their cardiologists, it was revealed that the majority of them thought this was not a problem related to cardiology. It should be kept in mind that such psychological problems could be related to CAD and could worsen the situation; thus, cardiologists should be aware that querying about these psychiatric characteristics is important in patients with CAD. Antiplatelet therapy is essential for the prevention of disease recurrence in patients with CAD.^[10] In the EUROASPIRE II and EUROASPIRE III surveys, it was reported that 85.9% and 90.5% of patients, respectively, were prescribed antiplatelet treatment.^[13] In our study, it was found that 86.7% of the participants received antiplatelet treatment, whereas 11.2% received no antiplatelet treatment. The remainder of the patients (2.1%) were unaware of whether they received such treatment. Although our results were simi-

lar to those reported by the aforementioned large studies, we believe that it is disturbing that at least 11% of subjects had not been prescribed an effective and vital medication. In addition, 50% of the patients had complaints of recurrent chest pain in our study. This is indirectly indicative that these patients were not adhering to the regimen, or they were being undertreated. This study showed that 40% of the respondents used herbal treatment in addition to, or instead of, their medical treatment, without asking for their physician's advice.

It is well established that there is a relationship between adaptation to secondary prevention recommendations and education level.^[23] In addition to education, residential and socioeconomic factors are among the characteristics that affected the awareness of patients about CAD risk factors.^[6] In this study, we observed that as the level of education increased, there was a decrease in the use of herbal medicine and an increase in compliance to exercise and diet recommendations.

In this study, as an important variation from previous studies, we assessed whether the patients were using herbal medications that had not been recommended by their physician. It was observed that the use of herbal therapy was inversely proportional to the level of education and awareness of secondary prevention. Herbal therapy can be represented as an indirect parameter of noncompliance to secondary prevention. The reason for this may be the difficulties or unwillingness of patients to apply to a health institution. Another possible reason may be related to busy polyclinics where physicians cannot adequately deal with the patients. Because the importance of drugs such as statins and antiplatelets on recurrence of the disease cannot be emphasized enough, patients can be more easily influenced by the media or their environment with no education in health. Conducting studies that examine this problem in detail may help us develop new methods to improve preventive medicine.

Another remarkable detail in this study was that men were more aware of secondary prevention compared with women. A study that compared the results of the EUROASPIRE IV survey with Turkey, as in our study, found that major risks factors such as obesity, diabetes, HT, hyperlipidemia, and smoking cessation after the index event were more in women than men. When women in our country are compared with European women, these parameters have been shown to be worse.^[19]

Similarly, the quality-of-life index and physical activity index of women in our country were found to be lower than the men and European women.^[24] The fact that women are worse than men and European women in secondary prevention may be directly related to education and economic situation. In countries where women received better education, women and men had equal or women had slightly higher awareness of secondary protection;^[5,25,26] whereas in countries where women were less educated, the opposite was true.^[2,6]

Limitations

The study had several limitations. First, the time of diagnosis of CAD and the duration with CAD was not evaluated. We know that compliance is higher in the early stages of the diagnosis of CAD, but it decreases as time progresses. The relationship between the level of awareness and the time/type of CAD (acute, chronic, bypass, and stent) has not been evaluated in terms of risk factors and drugs. The patients were not informed about the item groups in the questionnaires, and the patients were expected to answer each question according to their own perceptions on this issue. This may have led to unavoidable variations in each item and also the whole questionnaire owing to possible differences in perception among patients. In the question related to diet, we evaluated adherence to the types of diet listed, but patients may have been following more than one diet. Stratifying diet types in more detail, determining the purpose of the diets, and recording the number of diets may have been valuable with respect to their relationships with various factors, including comorbidities. Finally, the questionnaire applied in this study was prepared by the researchers and was neither standardized nor validated; hence an overall score could not be calculated, and we performed analysis of each question separately. We believe that taking these factors into account would benefit future studies.

Conclusion

It was observed that the participants had more awareness about risk factors frequently emphasized in social and visual media, such as smoking and obesity, whereas they did not have sufficient awareness about the rest of the risk factors. Therefore, we conclude that the most effective method to raise awareness about secondary prevention in CAD is through social and visual media. In this study, there appeared to be 2 primary reasons for the deficiencies in secondary pre-

vention. The first is insufficient information, and the second is the questionable reliability of information sources. We believe that both of these are associated with the fact that physicians cannot allocate enough time for patient guidance. The increasing number of patients diagnosed with CAD increases the workload of physicians in terms of diagnosis and treatment; and therefore, they spend less time advising patients on secondary prevention. More active participation of nurses trained in secondary prevention of CAD and primary care physicians could be considered as a solution to this problem. Furthermore, a previous study showed that pharmacists could play an effective role in educating patients with CAD about secondary prevention.^[25] In addition to the traditional risk factors, patients' sexual lives and concerns about heart diseases should also be researched, and awareness regarding these factors should be increased.

Ethics Committee Approval: Ethics committee approval was received for this study from the Clinical Researches Ethics Committee of Çanakkale Onsekiz Mart University (Approval Date: January 24, 2018; Approval Number: 02-02).

Informed Consent: Written informed consent was obtained from the patients who participated in this study.

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- Keywords:** Coronary artery disease; cardiovascular risk factors; secondary prevention; awareness
- Anahtar Kelimeler:** Koroner arter hastalığı; kardiyovasküler risk faktörleri; ikincil korunma; farkındalık

18. Do you know your height?

- 1.() Yes.....cm 2.() No

19. Do you know your weight?

- 1.() Yes.....kg 2.() No

20. When was the last time you weighted?

- 1.() In 3 months 2.() In 6 months 3.() In a year
4.() In three years 5.() In five years 6.() I don't remember.

21. Do you know that the body mass index, calculated with height and weight, is a crucial factor in cardiovascular disease progression?

- 1.() Yes 2.() No

22. If you know, where did you learn it from?

- 1.() Doctor 2.() Someone else (not a healthcare professional) 3.() Media
4.() Internet - Health Website

23. Do you know your waist circumference?

- 1.() Yes.....cm 2.() No 3.() I don't remember.

24. When was the last time your waist circumference was measured?

- 1.() In 3 months 2.() In 6 months 3.() In a year
4.() In 3 years 5.() In 5 years 6.() none

25. Do you know that keeping your waist circumference value below a certain value is very important for the progression of cardiovascular disease?

- 1.() Yes 2.() No

26. If you know, where did you learn it from?

- 1.() Doctor 2.() Someone else (not a healthcare professional) 3.() Media
4.() Internet - Health Website

27. What exercises do you perform?

- 1.() Walking at a slow pace 2.() Walking at a fast pace 3.() Do not perform any exercises

28. Do you know that reasonable exercise is a very important positive factor in the progression of cardiovascular disease?

- 1.() Yes 2.() No

29. If you know, where did you learn it from?

- 1.() Doctor 2.() Someone else (not a healthcare professional) 3.() Media
4.() Internet - Health Website

30. Have you smoked or used a tobacco product (pipe, cigar, hookah, etc.) throughout your life?

- 1.() Yes, I am still using. 2.() Yes, but I quit. 3.() No.

31. If you quit smoking after establishing a final diagnosis, why?

- 1.() Doctor 2.() Someone else (not a healthcare professional) 3.() Media
4.() Internet- Health Website 5.() My decision.

32. Do you know that continuing to smoke will worsen your cardiovascular disease?

- 1.() Yes 2.() No

33. If you know, where did you learn it from?

- 1.() Doctor 2.() Someone else (not a healthcare professional) 3.() Media
4.() Internet - Health Website

34. Do you use alcohol?

- 1.() Yes, everyday 2.() Yes, not everyday (social drinker) 3.() No

35. What kind of diet do you adhere to?

- 1.() Low-sugar diet 2.() Vegetable and fruit based diet
3.() Low fat diet 4.() None

36. Do you know that proper diet is very important for the progression of heart disease?

- 1.() Yes 2.() No

37.If you know, where did you learn it from?

- 1.() Doctor 2.() Someone else 3.() printed media
4.() visual media 5.() Internet- Health Website 6.() Internet - Social Media

38. Do you have diabetes?

- 1.() Yes 2.() No 3.() I don't know.

39. Do you know that keeping blood sugar in a normal range is very important to prevent cardiovascular disease?

- 1.() Yes 2.() No

40. If you know, where did you learn it from?

- 1.() Doctor 2.() Someone else (not a healthcare professional) 3.() Media
4.() Internet - Health Website

41. Do you have hypertension?

- 1.() Yes 2.() No 3.() I don't know

42. Do you know that normal blood pressure range is very important to prevent cardiovascular disease?

- 1.() Yes 2.() No

43. If you know, where did you learn it from?

- 1.() Doctor 2.() Someone else (not a healthcare professional) 3.() Media
4.() Internet - Health Website

44. Do you have high cholesterol?

- 1.() Yes 2.() No 3.() I don't know

45. Do you know that low levels of LDL, particularly referred to as malignant cholesterol, is very important for the progression of your cardiovascular disease?

- 1.() Yes 2.() No

46. If you know, where did you learn it from?

- 1.() Doctor 2.() Someone else (not a healthcare professional) 3.() Media
4.() Internet - Health Website

47. How many days after the heart attack, angiography or coronary bypass surgery did you have sexual intercourse?

- 1.() 1 -3 days 2.() 3-7 days 3.() 1-2 weeks
4.() 2-4 weeks 5.() 4-6 weeks 6.() Other.....

48. How did you determine this period?

- 1.() Doctor 2.() Someone else (not a healthcare professionalist) 3.() Media
4.() Internet- Health Website 5.() My decision.

49. Have you had symptoms such as, fear of death, lack of joy, decreased personal care, neglect of situations or people that you care for, disruption of eating habits or sleep patterns, after heart attack, angiography or heart surgery?

- 1.() Yes 2.() No

50. Did you share this information with your cardiolog?

- 1.() Yes 2.() No

51. Why didn't you share your "post-heart attack, angiography or heart surgery symptoms" information with your doctor?

- 1.() I thought my doctor would not be interested because she/he was a cardiologist
2.() Because of my heart problems, it was not time to talk about these problems.
3.() Since the doctor's outpatient clinic was very intense, there was no time to explain my extra-heart problems
4.() I talked to a psychiatrist
5.() Other.....

52. Do you take an antiplatelet drug (aspirin, kolpidogrel, plasugrel, tciagrelor) every day?

- 1.() Yes 2.() No 3.() I don't know

53. Do you know that, in the absence of any side-effects, antiplatelet drugs will be taken regularly and daily for the rest of your life?

- 1.() Yes 2.() No

54. If you know, where did you learn it from?

- 1.() Doctor 2.() Someone else (not a healthcare professional) 3.() Media
4.() Internet - Health Website

55. Do you take pills for cholesterol/hyperlipidemia?

- 1.() Yes 2.() No

56. Do you know that when cholesterol pills are ceased or not used at adequate doses, your heart disease will progress rapidly, which could threaten your life?

1.() Yes 2.() No

56 . If you know, where did you learn it from?

1.() Doctor 2.() Someone else (not a healthcare professional) 3.() Media

4.() Internet - Health Website

57. Do you use a drug or herbal derivative that increases sexual performance?

1.() Yes 2.() No

58. If you use a drug or herbal derivative that increases sexual performance, who suggested them?

1.() Doctor 2.() Someone else (not a healthcare professionalist) 3.() Media

4.() Internet- Health Website 5.() My decision.

59. Do you know that sexual enhancement drugs, especially sildenafil and its derivatives, should not be used with certain drugs that relieve your chest pain? (n:465)

1.() Yes 2.() No

60. If you know, where did you learn it from?

1.() Doctor 2.() Someone else (not a healthcare professional) 3.() Media

4.() Internet - Health Website

61. Have you used a non-drug treatment method, especially any herbal product, for your heart disease?

1.() Yes (Name:) 2.() No

62. If you use a non-drug treatment method, epecially any herbal product, who suggested them?

1.() Doctor 2.() Someone else (not a healthcare professionalist) 3.() Media

4.() Internet- Health Website 5.() My decision.