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Depressive Mood in Association With Sociodemographic, Behavioral, Self-Perceived Health, and Coronary Artery Disease Risk Factors and Sleep Complaints

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Key Words: *depressive mood; sociodemographic variables; self-perceived health; behavioral factors; coronary artery disease; sleep complaints.*

Summary. *The aim of the study was to investigate depressive mood in association with sociodemographic, behavioral, self-perceived health, and coronary artery disease (CAD) risk factors and sleep complaints among 35–74-year-old citizens of Palanga.*

Material and Methods. A representative sample of randomly selected 1602 persons, 600 men and 1002 women, was studied. Depressive mood was assessed by the WHO-5 Well-being Index. Sleep complaints, self-perceived health, and behavioral factors were evaluated by the Basic Nordic Sleep Quality questionnaire and Questionnaires on Self-Perceived Health and Health Behavior. Risk factors for CAD were assessed according to WHO recommendations.

Results. The highest prevalence of depressive mood (34.7%) was identified in the age group of 45–54 years in the men and in the age group of 55–64 years in the women (30.0%). The highest odds ratios demonstrating a strong association between depressive mood and health behavior were established for the use of antidepressants (OR=26.0) in the men and for the use of sedatives (OR=3.09) in the women. The highest odds ratios demonstrating an association between depressive mood and self-perceived health were established for chronic pyelonephritis (OR=3.13) in the men and diabetic foot pain (OR=4.46) in the women. The highest odds ratios reflecting an association between depressive mood and sleep quality were established for the inability to work due to disturbed sleep (OR=1.93) in the men and self-perceived sleep quality (OR=1.55) in the women.

Conclusions. Depressive mood, which was significantly associated with risky health behavior, poor self-perceived health, and disturbed sleep, was observed more often in the women than the men; however, significant associations between depressive mood and risk factors for CAD were not established.

Introduction

Depression as compared with other psychiatric disorders, such as schizophrenia, bipolar disorder, and panic disorder, is the greatest contributor, causing 51.8 million disability-adjusted life years (DALYs) or 30.8% of the total neuropsychiatric disease burden and 3.4% of the total disease burden globally (1). Psychiatric disorders, mainly depression and anxiety, are frequently encountered in primary care and are a major cause of distress and disability. Nearly half of cases go unnoticed, and among those that are recognized, many do not receive adequate treatment (2).

Depression is an independent risk factor for cardiac events in a population without known coronary artery disease (CAD) and also in patients with an established diagnosis of CAD, particularly after myocardial infarction (3). Studies have shown an approximately 2-fold greater relative risk of developing CAD in depressed groups than nondepressed groups; some studies have shown a dose-response effect in which greater exposure to depression leads to a higher incidence of coronary events (4). Depressive symptomatology confers an increased risk of CAD in men and total mortality in men and women but is not explained by health behavior, social isolation, or biological or clinical determinants (5). In fact, a stronger relation with CAD outcomes (either fatal or combined fatal and nonfatal) has been found with clinically defined depression. Having with a depressed mood and clinical depression was associated with a 1.49- and 2.69-fold greater likelihood, respectively, to develop coronary heart disease (6).

Scientific findings have suggested a possible synergistic effect of obesity and depressive mood on chronic low-grade inflammation, which might play a crucial role in the pathogenesis of atherosclerosis (7). A U-shaped association has been identified

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between low-density lipoprotein cholesterol and severe depression among men, and the necessity for further studies of the biological mechanisms and the identification of clinical implications in the population, vulnerable to psychiatric disorders, has been proven (8). In the general population, clinically significant depression (OR=1.59, 95% CI, 1.17–2.17) and a previous diagnosis of depression (OR=1.50, 95% CI, 1.16–1.94) have been reported to be associated with current smoking. Each cigarette per day was found to be associated with a 3% increase in a likelihood of clinically significant depression (9). There are several plausible biobehavioral mechanisms for which there is some initial empirical support, including lifestyle factors, diet, exercise, tobacco use, heavy use of alcohol, and no adherence to treatment, and traditional risk factors like arterial hypertension, diabetes, obesity, and insulin resistance, as well as other physiological factors associated with depression, such as platelet activation, autonomic nervous system deregulation, endothelial dysfunction, inflammation, and genetic factors. It is also possible that depression increases the risk of acute cardiac events but not chronic atherosclerosis. These are important areas for an additional study as the identification of mechanisms may help guide interventions for patients with CAD who are at an increased risk due to depression (10). A significantly higher prevalence of depression, anxiety, and/or sleeping disorders has been reported in women as compared with men (68.7% vs. 32.3%). Depression and sleep disorders are associated with smoking, a hazardous level of alcohol drinking, low quality of life, and there is a strong positive association with circulatory and gastrointestinal diseases (11).

The aim of the study was to investigate depressive mood in association with sociodemographic, behavioral, self-perceived health, and CAD risk factors and sleep complaints among 35–74-year-old citizens of Palanga, which is located in the western part of Lithuania on the Baltic Sea coast.

Material and Methods

Selection Process and Participants. An independent random sample of 2500 citizens of Palanga aged 35–74 years was drawn from the National Population Register. The study was approved by the Lithuanian Bioethics Committee. Citizens of Palanga were chosen as an object of investigation because they represent a close community with minor migration reflecting the population of the western part of Lithuania. There are no epidemiological data of behavior, stress, depressive mood, sleep disturbances, and CAD risk factors in this region of Lithuania.

The random stratified selection was performed in the following age groups: 35–44, 45–54, 55–64, and 65–74 years. The calculated sample size was 1630±33 persons with the probability of 0.954. The potential respondents were contacted by phone. During 16 months, the data of 1602 persons, 600 men and 1002 women, were collected. The response rate was 68.5%. According to age, the respondents were divided into 4 groups: 35–44 (n=402), 45–54 (n=390), 55–64 (n=438), and 65–74 years (n=372) old. The sample represented the population of Palanga aged 35–74 years with respect to age and gender.

Questionnaires. The WHO-5 Well-being Index (12) questionnaire contained 5 questions reflecting the well-being of a person during the last 2 weeks. Depressive mood (13) is a psychological state but not a clinically diagnosed depression, with a subjective perception of different negative symptoms, such as feeling sad, empty, hopeless, worried, helpless, worthless, guilty, irritable, hurt, and restless, loss of interest in activities that once were pleasurable, loss of appetite, problems concentrating, remembering details, or making decisions, fatigue, loss of energy, or aches, pains, digestive problems, or disturbed sleep. After filling in the questionnaire, the raw score was multiplied by 4. In this way, the received score varied from 0 to 100. The respondents who scored 50 and more did not have depressive mood. For the respondents who scored less than 50, depressive mood was identified, and they were ascribed to the group of an increased risk of depression.

The Questionnaire on Behavioral Factors (14) contained questions about smoking, alcohol consumption, and physical activity during the last year.

The Questionnaire on Self-Perceived Health (14) contained questions about complaints and diagnosed diseases, medicines used during the last year, frequency of stress events, and visits to any doctor.

The Basic Nordic Sleep Questionnaire (15) was used to assess the most frequent sleep complaints, i.e., problems of falling asleep, nighttime awakenings, self-rated sleep quality and sleep latency period, sleepiness during daytime, taking naps, and using sleeping pills.

The Questionnaire on General Data (14) was used to collect the information about the marital status, education, employment and income of respondents.

Objective Investigation. Arterial blood pressure (ABP) was measured twice with a quicksilver sphygmomanometer on the right hand while the investigated person was sitting, with the precision of 2 mm Hg (16). The average of 2 readings was used in the analysis. Arterial hypertension was defined if systolic and/or diastolic blood pressure was $\geqslant$140/90 mm Hg and/or a person was using antihypertensive medicines.

Weight and Height Measurement. Body height was measured in stocking feet (without shoes) with a rigid ruler attached to a wall and a wooden triangle. Body weight was measured without clothes using a mechanical scale. Body mass index (BMI) was calculated. Overweight was defined as BMI ⩾25.0 kg/m^2 and obesity as BMI ⩾30.0 kg/m^2.

Laboratory Measurements. Venous blood for biochemical lipid analysis was taken by vacutainers. The participants were asked to fast at least 12 hours before investigation. Coagulated blood after 20–30 minutes was centrifuged at 3000 rpm for 15 minutes. The serum cholesterol level was analyzed by the enzymatic (CHOD-PAP) method (17). Hypercholesterolemia was defined when the cholesterol level was ⩾5.0 mmol/L.

Statistical Analysis. Direct standardization by sex was performed. The categorical variables were compared using the chi-square (χ^2) and z tests for the comparison of the proportions between the groups. The results of the proportions were presented as percentages with 95% confidence intervals (CI). The binary logistic regression analysis was used to determine the relative significance of depressive mood as a predictive variable according to sociodemographic and CAD risk factors. Depressive mood was chosen as a dependent variable. The binary logistic regression analysis, using a backward method, was employed to remove variables with P>0.05 and to study the factors (informative behavioral, self-perceived health, and sleep quality variables) potentially associated with depressive mood. The multivariate analysis of the variables was performed. Odds ratios (OR) with 95% CI were calculated. A P value below 0.05 was assumed to indicate significance. Statistical analysis was performed using the SPSS 20.0 statistical software.

Results

Depressive Mood in Association With Sociodemographic Variables. Depressive mood was found in 28.2% (n=451) of the investigated population. The women had depressive mood more often than the men (30.0% [95% CI, 27.2–32.9] vs. 25.0% [95% CI, 21.5–28.5], respectively; P<0.05). The prevalence of depressive mood was compared between the men and the women in different age groups. Depressive mood was more often identified in the group of the men aged 45–54 years as compared with the women of the same age. The highest prevalence of depressive mood was identified among the men aged 45–54 years and the women aged 55–64 years (Table 1).

The depressed men, as compared with the depressed women, more often reported being married or living with someone (88.7% vs. 63.1%, P<0.001). The depressed women, as compared with the depressed men, more often were divorced or widowed (32.6% vs. 10.0%, respectively, P<0.001). A greater percentage of the depressed women than the depressed men had a smaller than average (<143 euros) income per month (78.3% vs. 64.1%, P<0.05). The depressed men were unemployed more often than the depressed women (64.0% vs. 49.8%, P<0.05) (Table 2).

Associations Between Depressive Mood and Sleep Complaints. The depressed men compared with the men in a normal mood complained more frequently about difficulties of falling asleep every night (8.7% vs. 3.3%, P<0.05), regular nighttime awakenings (42.7% vs. 31.8%, P<0.05), and excessive sleepiness every morning (15.3% vs. 5.6%, P<0.001). The depressed men used sleeping pills more often than the men whose mood was normal (5.3% vs. 1.1%, P<0.05).

The depressed women complained more often than the women in a normal mood about difficulties of falling asleep every night (13.0% vs. 6.3%, P<0.001), nighttime awakenings (48.5% vs. 34.6%, P<0.001), too early morning awakenings (11.6% vs. 5.4%, P<0.001), excessive sleepiness every morning (24.9% vs. 10.6%), and a decreased ability to work because of poor sleep quality (6.3% vs. 0.4%, P<0.001). The depressed women used sleeping pills more often than the women whose mood was normal (9.0% vs. 2.6%, P<0.001).

Sleep complaints and use of sleeping pills were more common in the depressed men and women, as compared with the men and women in a normal mood.

Prevalence of Risk Factors for Coronary Artery Disease and Associations With Depressive Mood. The data of regular smoking, overweight, obesity, arterial hypertension, and hypercholesterolemia were standardized according to age. The most prevalent risk factors for CAD in the sample, representative

Table 1. Prevalence of Depressive Mood Among Men and Women by Different Age Groups

Age	Men (n=150)	Women (n=301)	z	P
35–44	32 (21.3) [15.1–28.3]	79 (26.2) [21.4–31.4]	1.17	0.300
45–54	52 (34.7) [27.2–42.5]	75 (24.9) [20.2–30.0]	2.11	0.049
55–64	36 (24.0) [17.5–31.2]	90 (30.0) [24.9–35.2]	1.35	0.224
65–74	30 (20.0) [14.0–26.8]	57 (18.9) [14.7–23.6]	0.27	0.887

Values are number (percentage) [95% confidence intervals].

Table 2. Sociodemographic Characteristics of Depressed Men and Women

Variable	Men (n=150)	Women (n=301)	*z*	*P*
Marital status				
Married/living with someone	133 (88.7) [83.1–93.3]	190 (63.1) [57.6–68.5]	6.72	<0.001
Single	2 (1.3) [0.1–3.8]	13 (4.3) [2.3–6.9]	2.27	0.130
Divorced/widowed	15 (10.0) [5.7–15.3]	98 (32.6) [27.4–38.0]	6.19	<0.001
Education				
Primary	6 (4.0) [1.5–7.7]	19 (6.3) [3.8–9.4]	1.29	0.414
Not finished secondary	27 (18.0) [12.2–24.6]	38 (12.6) [9.1–16.6]	1.46	0.174
Secondary/college	73 (48.7) [40.7–56.7]	177 (58.8) [53.2–64.3]	2.04	0.053
University	44 (29.3) [22.3–36.9]	67 (22.3) [17.7–27.2]	1.60	0.132
Income per month, euros				
<143	91 (64.1) [56.0–71.8]	234 (78.3) [73.4–82.8]	3.02	0.003
⩾143	51 (35.9) [28.2–44.0]	65 (21.7) [17.2–26.6]		
Employment status				
Unemployed	96 (64.0) [56.1–71.5]	150 (49.8) [44.2–55.5]	2.91	0.006
Employed	54 (36.0) [28.5–43.9]	151 (50.2) [44.5–55.8]		

Values are number (percentage) [95% confidence intervals].

Table 3. Standardized Prevalence Rates of Risk Factors for Coronary Artery Disease Among Men and Women in the Whole Sample

Risk Factor for CAD	Men (n=600)	Women (n=1002)	*z*	*P*
Regular smoking	156 (26.0) [22.6–29.6]	86 (8.6) [6.9–10.4]	8.72	<0.001
Overweight	265 (44.2) [40.2–48.2]	341 (34.1) [31.2–37.0]	4.01	<0.001
Obesity	153 (25.5) [21.3–28.5]	315 (31.5) [27.7–33.2]	2.59	0.012
Hypercholesterolemia	430 (72.4) [68.3–75.9]	780 (77.9) [74.6–79.7]	2.77	0.006
Arterial hypertension	322 (53.7) [49.7–57.7]	493 (49.3) [46.1–52.3]	1.73	0.093

Values are number (percentage) [95% confidence intervals]. CAD, coronary artery disease.

for the adult population of Palanga, were hypercholesterolemia (74.6%) and arterial hypertension (50.9%). Approximately one-third of the investigated persons were overweight (37.5%) or obese (27.7%). Regular smoking (15.1%) was less prevalent in the sample, representing the general population of the city of Palanga, as compared with other risk factors for CAD.

The men of the whole sample were defined as regular smokers more often than the women of the whole sample (26.0% vs. 8.6%, $P<0.001$) (Table 3). The women had hypercholesterolemia more often than the men (77.9% vs. 72.4%, respectively; $P<0.05$) (Table 3). Significant associations between depressive mood and risk factors for CAD were not established.

Behavioral, Self-perceived Health, and Sleep Quality Factors in Association with Depressive Mood. Behavioral (smoking, alcohol consumption, and physical activity) and self-perceived health variables (self-perceived health, number of visits to a doctor, stress experience, pain at night, and use of different medicines) were introduced to the multivariate model in order to identify the factors significantly associated with depressive mood. Depressive mood in the men (Table 4) was significantly associated with the use of antidepressants (OR=26.0), chronic pyelonephritis (OR=3.13), stomachache (OR=2.81), use of sleeping pills (OR=2.35), self-perceived health (OR=2.32), low back pain at night (OR=2.23), spine problems (OR=2.10), use of pain-relieving medicines (OR=2.09), use of cough-reducing medicines (OR=2.03), stress experience (OR=2.00), strong alcohol drinking (OR=1.24), number of visits to a doctor (OR=1.06), or physical activity (OR=0.74). Depressive mood in the women (Table 4) was significantly associated with diabetic foot pain (OR=4.46), use of sedatives (OR=3.09), use of pain-relieving medicines (OR=2.38), stress experience (OR=2.26), self-perceived health (OR=2.09), waist pain at night (OR=2.04), headache at night (OR=1.93), spine problems (OR=1.88), rheumatic arthritis (OR=1.75), pain in joints at night (OR=1.57), smoking (OR=1.56), or strong alcohol drinking (OR=1.4).

The sleep quality variables (sleep latency period, frequency of awakenings, self-perceived sleep quality, use of sleeping pills, sleepiness in the morning or daytime, sleep duration at night, frequency of naps and snoring, breathing pauses, and inability to work due to disturbed sleep) were introduced to the multivariate model in order to identify the sleep quality factors significantly associated with depressive mood. Depressive mood in the men (Table 5) was significantly associated with inability to work due to disturbed sleep (OR=1.93), frequency of awakenings (OR=1.44), sleepiness in the morning (OR=1.43), breathing pauses during sleep (OR=1.32), frequency of use of sleeping pills (OR=1.27), sleep latency on weekends (OR=1.02), daytime sleepiness

Table 4. Informative Variables of Behavior and Self-Perceived Health for Depressive Mood Among Men and Women (Logistic Regression Model)

Variable	Men (n=600)			Women (n=1002)		
	B	OR (95% CI)	*P*	B	OR (95% CI)	*P*
	Depressive mood (n=150) Nagelkerke R^2=0.17			Depressive mood (n=301) Nagelkerke R^2=0.17		
Smoking	–0.07	0.93 (0.74–1.17)	0.529	0.44	1.56 (1.12–2.17)	0.009
Strong alcohol drinking	0.22	1.24 (1.03–1.51)	0.021	0.34	1.4 (1.06–1.86)	0.019
Physical activity	–0.30	0.74 (0.66–0.84)	<0.001	–0.15	0.87 (0.78–0.96)	0.004
Self-perceived health	0.84	2.32 (1.40–4.60)	<0.001	0.74	2.09 (1.72–2.54)	<0.001
	Nagelkerke R^2=0.18			Nagelkerke R^2=0.21		
Number of visits to a doctor	0.06	1.06 (1.02–1.10)	0.008	0.01	1.01 (0.98–1.05)	0.409
Stress experience	0.69	2.00 (1.49–2.69)	<0.001	0.81	2.26 (1.83–2.78)	<0.001
Headaches at night	0.42	1.53 (0.89–2.60)	0.121	0.66	1.93 (1.33–2.80)	0.001
Pain in joints at night	0.41	1.51 (0.95–2.38)	0.080	0.45	1.57 (1.13–2.19)	0.007
Diabetic foot pain	0.91	2.48 (0.58–10.51)	0.219	1.43	4.46 (1.09–18.24)	0.038
Stomach aches at night	1.03	2.81 (1.58–5.01)	<0.001	0.12	1.12 (0.70–1.81)	0.615
Low back pain at night	0.80	2.23 (1.43–3.49)	<0.001	0.34	1.41 (0.96–2.07)	0.082
Waist pain at night	0.09	1.09 (0.60–1.99)	0.773	0.71	2.04 (1.36–3.07)	0.001
	Nagelkerke R^2=0.05			Nagelkerke R^2=0.04		
Rheumatic arthritis	0.68	1.97 (0.83–4.71)	0.126	0.56	1.75 (1.05–2.91)	0.031
Spine problems	0.74	2.10 (1.23–3.57)	0.007	0.63	1.88 (1.30–2.70)	0.001
Chronic pyelonephritis	1.14	3.13 (1.15–8.55)	0.026	0.56	1.75 (0.88–3.47)	0.112
	Nagelkerke R^2=0.14			Nagelkerke R^2=0.15		
Use of sedatives	0.37	1.45 (0.84–2.52)	0.185	1.13	3.09 (2.27–4.22)	<0.001
Use of sleeping pills	0.86	2.35 (1.19–4.65)	0.014	0.45	1.57 (1.00–2.49)	0.052
Use of antidepressants	3.26	26.0 (3.20–211.70)	0.002	0.27	1.32 (0.59–2.92)	0.501
Use of pain-relieving medicines	0.74	2.09 (1.32–3.30)	0.002	0.87	2.38 (1.76–3.20)	<0.001
Use of cough-reducing medicines	0.71	2.03 (1.14–3.62)	0.016	0.46	1.59 (0.97–2.60)	0.064

OR, odds ratios; CI, confidence intervals.

Table 5. Informative Variables of Sleep Quality for Depressive Mood Among Men and Women (Logistic Regression Model)

Variable	Men (n=600)			Women (n=1002)		
	B	OR (95% CI)	*P*	B	OR (95% CI)	*P*
	Depressive mood (n=150) Nagelkerke R^2=0.16			Depressive mood (n=301) Nagelkerke R^2=0.19		
Sleep latency in minutes (weekend)	0.02	1.02 (1.01–1.03)	0.007	0.01	1.01 (0.99–1.01)	0.268
Frequency of awakenings	0.37	1.44 (1.18–1.76)	<0.001	0.33	1.40 (1.20–1.63)	<0.001
Self-perceived sleep quality	0.13	1.14 (0.88–1.49)	0.330	0.44	1.55 (1.28–1.86)	<0.001
Frequency of use of sleeping pills	0.24	1.27 (1.05–1.54)	0.015	0.12	1.13 (1.01–1.27)	0.029
Sleepiness in the morning	0.36	1.43 (1.23–1.68)	<0.001	0.23	1.26 (1.14–1.40)	<0.001
Daytime sleepiness	–0.25	0.78 (0.64–0.94)	0.009	–0.04	0.96 (0.84–1.10)	0.556
Sleep duration at night	0.00	1.00 (0.86–1.17)	0.996	0.15	1.16 (1.03–1.30)	0.014
	Nagelkerke R^2=0.26			Nagelkerke R^2=0.20		
Frequency of naps	0.05	1.05 (0.91–1.22)	0.498	0.25	1.28 (1.00–1.65)	0.051
Snoring	–0.33	0.72 (0.56–0.93)	0.012	–0.11	0.90 (0.78–1.03)	0.133
Duration of snoring	–0.02	0.99 (0.96–1.01)	0.253	0.04	1.04 (1.01–1.07)	0.012
Breathing pauses	0.28	1.32 (1.03–1.69)	0.027	0.23	1.26 (1.03–1.55)	0.025
Inability to work due to disturbed sleep	0.66	1.93 (1.33–2.80)	0.001	0.37	1.45 (1.10–1.90)	0.008
Consultations with doctor about insomnia	–1.75	0.17 (0.06–0.54)	0.003	–0.96	0.38 (0.18–0.83)	0.014
				Nagelkerke R^2=0.05		
WHO Well-being Index	0.49	1.62 (0.71–3.73)	0.002	3.07	21.55 (3.0–156.5)	0.002

OR, odds ratios; CI, confidence intervals.

(OR=0.78), snoring (OR=0.72), or consultations with a doctor about insomnia (OR=0.17). Depressive mood in the women (Table 5) was significantly associated with self-perceived sleep quality (OR=1.55), inability to work due to disturbed sleep (OR=1.45), frequency of awakenings (OR=1.40), sleepiness in the morning (OR=1.26), breathing pauses during sleep (OR=1.26), sleep duration at night (OR=1.16), frequency of use of sleeping pills (OR=1.13), duration of snoring (OR=1.04), or consultations with a doctor about insomnia (OR=0.38).

Discussion

The results of our study demonstrated that the women significantly more often than the men had depressive mood. These findings are similar to the results of the Health Behavior among Lithuanian Adult Population study, performed in 2010 (14). In this study, health behavior was investigated in a randomly selected sample of people, living in different regions of Lithuania. According to the results of the Health Behavior among Lithuanian Adult Population study, a greater proportion of the women than the men experienced depressed mood during the last 12 months (59.9% and 53.0%). Our study results demonstrated that the depressed men were more often unemployed than the depressed women. This is contradictory to the results obtained in the Health Behavior among Lithuanian Adult Population study, which showed that the depressed women in the representative sample of the Lithuanian population were more often unemployed as compared with the men (18.6% and 14.0%).

Our study results could be used as a scientific background for planning preventive measures for controlling risk factors for chronic noncommunicable diseases. The priority for the implementation of preventive measures should be given to women because a greater part of them suffer from depressive mood as compared with men. Preventive measures implemented among depressed men should be oriented toward the prevention of cardiovascular mortality as the results of a 12-year population-based study, conducted in the north-east of France (18), demonstrated that depressive mood in men significantly predicted cardiovascular mortality (HR=1.63; 95% CI, 1.00–2.65). Preventive measures among depressed women should be oriented toward cancer prevention because depressive mood in women significantly predicted cancer mortality (HR=1.71; 95% CI, 1.11–2.64) (18).

The relationship between sleep complaints and the prevalence of depressive mood in the representative sample of Palanga population was observed. The individuals who were in a depressive mood more frequently complained about the difficulties of falling asleep, awakenings at night, and early awakenings in the morning and more often used sleeping pills and experienced inability to work due to poor sleep quality, as compared with the persons without mood disorders. Associations between insomnia symptoms and an increased risk of subsequent depression in an elderly general population were confirmed by the results of a 4-year longitudinal study (19), conducted in 3 French cities (Bordeaux, Dijon, and Montpellier). The results of our study confirmed the associations between depressive mood, sleep problems, and use of antidepressants, which had been proposed by previous studies (20) indicating that sleep problems sometimes emerged as a symptom of depression or a side effect of treatment.

Our study showed that the smoking rates among the men and the women (26% and 8.6%, respectively) of the city of Palanga were lower as compared with the smoking rates among the men and the women aged 25–64 years of 5 rural regions (Kaišiadorys, Kretinga, Kupiškis, Joniškis, and Varėna) of Lithuania (47.5% in the men and 18.1% in the women) (21). The prevalence of obesity among the men and the women (25.5% and 31.5%, respectively) of the city of Palanga was higher than that among the men and the women of 5 rural regions of Lithuania (22.8% and 29.8%, respectively). The prevalence of hypercholesterolemia among the men and the women (72.4% and 77.9%, respectively) of the city of Palanga was also higher as compared with the prevalence of hypercholesterolemia among the men and the women of 5 rural regions of Lithuania (22.8% and 29.8%, respectively) (21).

Depression with somatic syndrome (depression followed by anorexia, sleep disorders, anxiety, pain, and fatigue) occurs mainly among women, while pure clinical depression predominates among men. This finding has been demonstrated in the study conducted in the sample representative of the adult German population aged 18–65 years (22). The findings of our study supported the hypothesis about co-occurrence of depression and somatic symptoms. Depressive mood among the women was significantly associated with headaches (OR=1.93), pain in joints (OR=1.57) at night, diabetic foot pain (OR=4.46), waist pains (OR=2.04), rheumatic arthritis (OR=1.75), or use of pain-relieving medicines (OR=2.38).

The results of our study did not demonstrate associations between depressive mood and risk factors for CAD, but strong relationships between depressive mood and socioeconomic factors, stress events, and sleep complaints were established. Our findings published previously (23) have confirmed poor self-perceived health, frequent stress events, and regular nighttime awakenings to be as poor sleep predictors. The same factors were significantly associated with depressive mood in this study, which is a proof of a strong correlation between depressive mood and poor sleep quality.

Our study has revealed common factors significantly associated with depressive mood in both the men and the women. The results of this study could be used in planning and implementing integrative preventive programs for controlling chronic noncommunicable diseases.

Conclusions

Depressive mood, which was significantly associ-

ated with risky health behavior, poor self-perceived health, and disturbed sleep, was observed more often among the women than the men; however, statistically significant associations among depressive mood and risk factors for coronary artery disease were not established.

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Statement of Conflict of Interest

The authors state no conflict of interests.

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