RESEARCH ARTICLE

WOMEN'S HEART AND DEPRESSION

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Abstract

Introduction: Depression is associated with increased morbidity and mortality in cardiovascular diseases and poor health outcomes. The **aim** of this study was to explore depression in women population. **Material and method:** The sample of the study included 300 women who had undergone cardiological evaluation in the outpatient clinic of a private hospital in Attica. Data collection was performed by completion of the Zung Self-Rating Depression Scale (SDS) which included women's characteristics. The level of statistical significance was set at $p<0.05$. **Results:** Of the 300 women who participated in the study 78.7% were married and 42.7% were working, while the mean age was 61.1±9.8 years. Regarding depression as was measured by SDS, 50% of women had a median of less than 38 and the mean was 38.4±8.0. These values in relation to the possible range (20-80) indicate moderate to low levels of depression. Statistically significant higher depression scores were obtained by women with heart disease in their medical history ($p=0.006$), with a history of allergies ($p=0.088$) and those women who had not undergone a 24hour ambulatory blood pressure monitoring ($p=0.018$). **Conclusions:** The present findings underly the importance of screening depression when women undergo cardiological evaluation.

Keywords: Women, depression, zung, cardiological evaluation, outpatients

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ΕΡΕΥΝΗΤΙΚΗ ΕΡΓΑΣΙΑ

ΓΥΝΑΙΚΕΙΑ ΚΑΡΔΙΑ ΚΑΙ ΚΑΤΑΘΛΙΨΗ

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Περίληψη

Η κατάθλιψη σχετίζεται με αυξημένη νοσηρότητα και θνησιμότητα στα καρδιαγγειακά νοσήματα και φτωχά κλινικά αποτελέσματα για την υγεία. **Σκοπός** της παρούσας έρευνας ήταν η διερεύνηση της κατάθλιψης σε γυναικείο πληθυσμό. **Υλικό και μέθοδος:** Το δείγμα της μελέτης αποτέλεσαν 300 γυναίκες που είχαν υποβληθεί σε καρδιολογική εκτίμηση στα τακτικά εξωτερικά ιατρεία ιδιωτικού νοσοκομείου του νομού Αττικής. Η συλλογή των δεδομένων πραγματοποιήθηκε με τη συμπλήρωση της κλίμακας αξιολόγησης της κατάθλιψης Zung Depression Scale (SDS), στην οποία συμπεριελήφθησαν τα χαρακτηριστικά των γυναικών. Το επίπεδο στατιστικής σημαντικότητας ορίστηκε στο $p<0.05$.**Αποτελέσματα:** Από τις 300 γυναίκες που συμμετείχαν στην μελέτη, το 78.7% ήταν έγγαμες και το 42.7% ήταν εργαζόμενες, ενώ η μέση ηλικία του δείγματος ήταν 61.1±9.8 έτη. Σχετικά με τη κατάθλιψη, όπως μετρήθηκε με την κλίμακα SDS, στο 50% των γυναικών η διάμεσος ήταν μικρότερη από 38 και η μέση τιμή ήταν 38.4±8.0. Οι τιμές αυτές σε σχέση με το πιθανό εύρος τιμών (20-80) υποδηλώνουν μέτρια προς χαμηλά επίπεδα κατάθλιψης. Στατιστικώς σημαντικά μεγαλύτερη βαθμολογία κατάθλιψης είχαν οι γυναίκες με νοσήματα καρδιάς στο ατομικό ιστορικό ($p=0.006$), με ιστορικό αλλεργιών ($p=0.088$) καθώς και οι γυναίκες που δεν είχαν υποβληθεί σε 24ωρη μέτρηση της αρτηριακής πίεσης ($p=0.018$). **Συμπεράσματα:** Τα ευρήματα της παρούσας μελέτης υπογραμμίζουν τη σημασία της εκτίμησης της κατάθλιψης όταν οι γυναίκες υποβάλλονται σε καρδιολογική εκτίμηση.

Λέξεις κλειδιά: Γυναίκες, κατάθλιψη, zung, καρδιολογική εκτίμηση, εξωτερικοί ασθενείς

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INTRODUCTION

Cardiovascular disease (CVD) is the leading cause of morbidity and mortality worldwide.[1] CVD is responsible for more than 17.3 million of deaths per year[2,3] and 35% of women's total deaths in 2019.[4] Furthermore, CVD is associated with significant financial burden, which is anticipated to increase in future due to improved survival combined with better treatment. For instance, the cost of CVD is estimated in Europe at 210 billion per year including direct health care cost, lost of productivity and informal care.[5]

In the United States, CVD was the leading cause of death in women accounting for 398.086 deaths in 2013.[2] In European Union, CVD in women accounts for 2.1 million deaths (49% of all deaths).[6,7] One in four women with a first episode of myocardial infraction dies within a year of diagnosis and more specifically, women below the age of 45 experience higher mortality rate than men.[8]

Meanwhile, anxiety or depression are a frequent comorbidity in CVD. More especially, depression is threefold higher in CVD compared to general population.[3,9,10]

There is a bidirectional relation between depression and CVD, with depression to trigger manifestation of CVD and vice versa.[11] Individuals with CVD who experience depression tent not to adopt behaviors that reduce cardiovascular risk, such as physical activity, smoking cessation, healthy eating and adherence to cardiovascular medication.[12]

It is widely known that, both sexes share similar "traditional" cardiovascular risk factors (i.e., arterial hypertension, obesity, hyperlipidemia, smoking, diabetes mellitus). However different parameters may affect cardiovascular outcome in women. More specific, factors of gynecological history such as early menarche and menopause, young maternal age, polycystic ovary syndrome, pre-eclampsia, gestational diabetes mellitus, premature delivery, recurrent miscarriage, pre-pregnancy obesity, early ovarian failure and contraceptive hormone therapy appear to affect the female cardiovascular system and increase future cardiovascular risk in the female sex.[13,14] Women tend to have more hormonal changes depending on the phase of their life.[15]

To the best of our knowledge, data exploring depression among women with suspected CVD are limited. Thus, the aim of this research study was to explore depression in women who undergo cardiological evaluation.

MATERIAL AND METHOD

Design and period of the study

In the present study were enrolled 300 women undergoing cardiological evaluation in the outpatient clinic of a private hospital in Attica. It was a convenience sample. The research was conducted between December 2020-February 2021.

Sample: inclusion and exclusion criteria

Inclusion criteria in the present study were age >18years old and the ability to write and read the Greek language fluently. Participants were excluded if they had a history of mental illness, were receiving antidepressants drugs and were hospitalized during study period. In the present research there was no intervention or control group since it merely recorded whether women experienced depression.

Data collection and procedure

Data collection was performed by the completion of the Zung Self-Rating Depression Scale (SDS), which also included demographic, clinical and other characteristics of patients. Participants were visiting for cardiac evaluation an outpatient clinical department of a private hospital in Attica. Completion of each questionnaire lasting approximately 15minutes and took place in a private

room of the outpatient clinical setting to ensure confidentiality.

Measurement of depression

The Zung Self-Rating Depression Scale (SDS) was used to assess depression in women undergoing cardiological evaluation. The SDS scale is a 20-item self-report instrument, which is widely used as a diagnostic tool for depression. Each question is rated on a 4-point Likert-scale (1 to 4), with 4 representing the most unfavorable answer. Addition of each question rating leads to a total score which ranges from 20 to 80. Total score may be classified in four categories to give an overall clinical estimation of depression. A total score of <40 is interpreted as normal or absence of depression, 40 to 47 indicates mild depression, 48 to 55 indicates moderate depression and a total score of 56 to 80 indicated severe depression. Overall, SDS has shown high reliability as Cronbach's alpha of 0.84 reveals an efficient internal validity.[16,17,18]

Ethical considerations

The study was approved by the Ethics Committee for Medical Research of the hospital that took part in and was conducted in accordance with the Declaration of Helsinki (1989) of the World Medical Association. Written, informed consent for participation was obtained from all patients after explanation of the purpose of the study. Participation was on a voluntary basis and anonymity was preserved.

Statistical analysis

Categorical variables are presented with absolute and relative (%) frequencies while continuous data are presented with mean, standard deviation, median and interquartile range (IQR). The normality of the data was tested with the Kolmogorov-Smirnov criterion and graphically with histograms and Q-Q plots. The Kruskal-Wallis and Mann-Whitney criteria were used to test for a correlation between depression scores and patients' characteristics, as well as the Spearman's rho criterion Multiple linear regression was performed to estimate the effect of traits on depression in women. Results are presented with b regression coefficient and 85% confidence intervals (CI). The observed 5% significance level was considered statistically significant. All statistical analyses were performed using the statistical package SPSS, version 25 (SPSS Inc, Chicago, Il, USA).

RESULTS

Descriptive characteristics

The demographic characteristics of women undergone cardiological evaluation are presented in Table 1. The mean age of participants was 61.1±9.8 years, while 78.7% were married, 42.7% were employees and 57.7% had two children.

Table 2 describes women's medical history. Regarding clinical characteristics, 22.1% had a cardiac history, 22% had cardiac symptoms and 15.1% were subjected to cardiac re-evaluation. In the sample studied, 13% had normal menstruation, 4% climacteric, 87.2% menopause and 4.1% early menopause. Polycystic ovaries were found in 8.5% of participants while 18.6% received oral contraceptive therapy. At least one pregnancy had 88% of participants, 2% had undergone hormone therapy for in vitro fertilization (IVF) and 0.3% had a premature birth. Furthermore, 9.2% had problems in pregnancy, 1.3% had history of breast cancer and 27.9% had a history of allergies. Moreover, 37.5% had heart murmur and 33.8% had carotid stenosis<50%.

In terms of laboratory tests, 45.2% had undergone heart ultrasound (cardiac triplex), 27% carotid ultrasound (carotid triplex), while 11% had undergone a 24hour heart monitoring (ECG holter) and 3.3% a 24hour ambulatory blood pressure monitoring (BPM holter) (Table 3).

The mean age of menstruation onset was 11.8±1.7 years, the mean age of climacteric onset was

47.0±5.7 years and the mean age of menopause onset was 50.0±4.4 years (Table 4).

Regarding measurements in the day of cardiological evaluation, the mean waist and hip circumference was 93.9±12.9cm and 108.8±10.1cm, respectively. The mean systolic and diastolic blood pressure was 123.2±16.8mmHg and 76.1±14.7mmHg, respectively. The mean oxygen saturation was 98%, the mean heart rate was 71.5±10.6 bpm, while the mean ejection fraction was 62.8±4.5% (Table 5).

Assessment of depression in women

In Table 6, it is observed that in a possible range of values 20-80, the mean value was 38.4±8.0 and the median value was 38 (25% had a score below 32) in SDS. These values indicate moderate to low levels of depression in women.

Association between depression and women's characteristics

Table 7 (a,b,c,d,e) represents the association of depression with women's characteristics. No significant relation was found between demographic characteristics.

In table 7b statistically significant higher depression scores were obtained by women who had heart disease in their medical cardiac history (p=0.006) and by women with a history of allergies (p=0.088). Women who had a cardiac disease history (coronary artery disease, arrhythmias, valvular disease) had statistically significant higher depression scores (median 40) than women who had other history (median 38) or women who undergone cardiac re-evaluation (median 36). In addition, higher depression scores were observed in women with history of allergies (median 40) than women without this history (median 37).

In Table 7c there was no association between depression and laboratory tests, except from 24hour ambulatory blood pressure monitoring. Women who had not undergone a 24hour ambulatory blood pressure monitoring (median 38) had statistically significant higher depression scores than women who had (median 32).

In Table 7d there was no association between depression and women's characteristics in the day of cardiological evaluation. In Table 7e there was no association between depression and age, or characteristics of women's menstrual cycle stage.

Effect of women's characteristics on depression

Multiple linear regression was performed to assess the effect of women's characteristics on depression (Table 8).

Women with cardiac disease history (coronary heart disease, arrhythmias, valvular disease) had 4.3 points statistically significant higher depression scores than those who undergone cardiac re-evaluation (b=4.3, 95% CI:1.1-7.4, p=0.008). Women with history of allergies had 2.2 points statistically significant higher depression scores than women without allergies history (b=2.2, 95% CI: 0.1-4.2, p=0.038). Finally, women who had not undergone a 24-hour ambulatory blood pressure monitoring had 6 points statistically significant higher depression scores than those who had undergone (b=6.0, 95% CI: 0.9-11.2, p=0.022).

DISCUSSION

The results of the present study showed moderate to low levels of depression.

Depression in women is a significant risk factor for the development of CVD. On the other side, women who had a cardiac event are more likely to experience depression compared to men.[19] Depression complicates optimal management of CVD by reducing compliance to treatment or adoption of unhealthy lifestyles.[15] Although the mechanisms linking depression to increased risk of CVD are complex and multifactorial, they are still not fully understood.[20]

A statistically significant association was observed between depression and cardiac disease history.

In a period of twenty years, diagnosis of depression predicts rates of coronary heart disease.[21]

The results also showed that women with a history of allergies experienced higher levels of depression. The incidence of allergy is higher in patients with depression. Patients with a history of allergy may have an increased rate of suicide.[22] Self-reported food allergies were associated with depression in a sample of 36.984 respondents.[23] A relevant study in Norway reported higher scores on the Hospital Anxiety and Depression Scale (HADs) in 130 people with self-reported food hypersensitivity compared with 75 patients without hypersensitivity.[24] Food allergy is a predictor of depression which depends on the number of allergens. The proportion of people experiencing severe psychological distress is higher among those who had food allergy.[25] Physicians should assess allergies in patients with depression and vice versa.[26,27]

The present study revealed depression in women who did not have a 24-hour ambulatory blood pressure monitoring. Possibly, individuals who experience depression tend not to seek for medical help. People with hypertension are at greater risk for developing a cardiovascular condition.[28,29,30,31] Depression in hypertensive patients is associated with poor health status and lower quality of life,[32,33,34] increased medical costs,[35] lower compliance with treatment[36] and increased mortality.[37]

Both depressed and hypertensive patients show increased sympathetic activity[38] and increased secretion of adrenocorticotropic hormone and cortisol.[39] It is pathophysiologically plausible that depression and hypertension affect each other. Lack of dopamine at key sites in the brain can increase blood pressure and/or trigger depression.[40] In addition, cerebrovascular and ischemic changes in the brain caused by high blood pressure may predispose depression in hypertensive individuals.[41]

Although the present study did not show an association between depression and menopause, the literature shows a high prevalence of depressive symtoms.[42] Screening for depression in middle-aged women is important because of the interaction between psychosocial and cardiovascular health.[43] Interestingly, depression in menopause has multifactorial etiology. The predictive factors include prior depressive events, comorbidity with mayor menopausal symptoms, stress of high intensity, increased body mass index, low socioeconomic status and ethnicity.[44]

Meanwhile, women develop heart disease several years later than men with a notable increase during transition to menopause period. Early age of menopause, is reported as a marker of greater CVD risk.[45]

The presence of a previous episode of depression seems to be a predictor of a major depressive episode during menopause.[46] A study conducted by Mulhall et al.,[47] who explored depression in 711 community residing women (age 50.6 ±1.5 years) with the Goldberg Depression Scale (GDS), showed that perimenopausal women had a 35% increased risk of depression symptoms compared to menopausal women. In postmenopausal women the rate was 31%. Ozdemir et al.,[48] also demonstrated 41% prevalence of depression in 485 postmenopausal women (age 56.33±7.34 years) using Beck Depression Inventory (BDI).

In the present study assessment of depression took place in an outpatient cardiology department. On the contrary, symptoms of depression may exist and vary between hospitalized women with heart disease. For example, patients admitted to the heart failure unit have a higher risk of depression compared to patients on other wards.[49]

Noteworthy, CVD in women are often misdiagnosed and therefore undertreated thus illustrating, the demand of early screening. Furthermore, women are underrepresented in clinical trials leading to restricted knowledge of CVD and the associated modalities in women's health. Meanwhile, women are less likely to

seek timely care for heart symptoms. Compared to men, women do not receive the same care which is mainly attributed to the aforementioned limited knowledge. It is of importance to reject stereotype that cardiovascular disease is a "male disease".[49,50]

Considering these aspects, the changing landscape is to emphasize on intervention strategies for both genders. Nowadays, there is notice and demand of gender inclusion in research with ultimate goal to improve scientific knowledge or innovation.

Study limitations

Convenience sampling was one of the limitations in this study. This method was not representative of all population of women in Greece undergoing cardiological evaluation, thus limiting the generalizability of results. The present research was not permitting investigation for causal relation between depression and women's characteristics. Other limitation was that participants were enrolled only from one hospital and the sample size was relatively small.

Depression was assessed through self-report questionnaires and there was no clinical evaluation or diagnosis by physicians. Finally, there was no next measurement that would allow evaluation of possible changes in all dimension under assessment (depression and women's characteristics) that had an impact on depression.

CONCLUSION

Depression was associated with cardiac disease history, history of allergies and absence of a 24-hours ambulatory blood pressure monitoring.

More research is needed to improve understanding of the mechanism underlying the relation between CVD and depression and the ways this association can be translated into clinical practice so as to improve women's health.

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Conflicts of interest

The authors declare no potential conflict of interest.

Disclosures

None

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APPENDIX

Table 1: Sample distribution according to demographic characteristics (n=300)		
	N (%)	
Marital Status		
Married	236(78.7%)	
Single	16(5.3%)	
Divorced	22(7.3%)	
Widowed	26(8.7%)	
Number of children		
0	41(13.7%)	
1	57(19.0%)	
2	173(57.7%)	
3	25(8.3%)	
4	4(1.3%)	
Job		
Employed	128(42.7%)	
Unemployed	7(2.3%)	
Retired	155(51.7%)	
Student	4(1.3%)	
Undergraduate	6(2.0%)	
	Mean (SD)	**Median (IQR)**
Age in years	61.1(9.8)	62(57-67)

Table 2: Sample distribution according to women's medical history (n=300)	
Medical history	**N (%)**
Cardiac disease history	
Heart diseases (coronary disease, arrhythmias, valvular disease)	66(22.1%)
Other history-non cardiac etiology	187(62.8%)
Cardiac re-evaluation	45(15.1%)
Symptoms	
Cardiac symptoms (palpitations, angina, fatigue)	66(22.0%)
Other symptoms-non cardiac etiology	234(78.0%)
Normal menstruation (Yes)	39(13.0%)
Climacteric (Yes)	12(4.0%)
Menopause (Yes)	258(87.2%)
Premature menopause (Yes)	12(4.1%)
Polycystic ovary syndrome (Yes)	25(8.5%)
Contraceptives therapy (Yes)	55(18.6%)
Pregnancy (Yes)	257(88.0%)
Hormone therapy for IVF (Yes)	6(2.0%)
Premature birth (Yes)	1(0.3%)
Problems in pregnancy (Yes)	27(9.2%)
Breast cancer history (Yes)	4(1.3%)
Allergies history (Yes)	83(27.9%)
Heart murmur	111(37.5%)
No existing of heart murmur	185(62.5%)
Carotid stenosis <50%	25(33.8%)
Without carotid stenosis	49(66.2%)

Table 3: Sample distribution according to performing laboratory tests (n=300)	
Laboratory tests	**N (%)**
Cardiac triplex (Yes)	135(45.2%)
Carotid triplex (Yes)	81(27.0%)
24hour heart monitoring-holter (Yes)	33(11.0%)
24hour ambulatory blood pressure monitoring (Yes)	10(3.3%)
Planning for	
Cardiac triplex	119(41.8%)
Carotid triplex	38(13.3%)
24hour heart monitor-holter	32(11.2%)
24hour ambulatory blood pressure monitoring	3(1.1%)
Heart stress test	20(7.0%)
Nutritional assessment for weight loss	4(1.4%)
Assessment to a psychologist	7(2.5%)

Table 4: Sample distribution according to age and menstrual cycle stage (n=300)		
Menstrual cycle	**Mean ($\bar{X}$±SD)**	**Median (IQR)**
Onset age of menstruation (n=40)	11.8(1.7)	12(11-13)
Onset age of climacteric(n=10)	47.0(5.7)	48(45-50)
Onset age of menopause (n=238)	50.0(4.4)	51(48-53)

Table 5: Sample distribution according to characteristics in the evaluation day (n=300)		
Day of cardiological evaluation	**Mean ($\bar{X}$±SD)**	**Median (IQR)**
Waist circumference	93.9(12.9)	93(84-102)
Hips circumference	108.8(10.1)	108(102-115)
Systolic blood pressure (SBP)	123.2(16.8)	120(110-134)
Diastolic blood pressure (DBP)	76.1(14.7)	80(70-85)
Oxygen saturation (SpO2%)	97.9(0.8)	98(97-98)
Heart rate (bpm)	71.5(10.6)	70(64-77)
Ejection fraction (n=127)	62.8(4.5)	65(60-65)

Table 6: Depression in women (n=300)		
	Mean ($\bar{X}$±SD)	**Median (IQR)**
Depression Zung scale (Range 20-80)	38.4±8.0	38(32-44)

Table 7a: Association between depression and women's characteristics (n=300)

Demographic characteristics	**Mean ($\bar{X}$±SD)**	**Median (IQR)**	**p-value**
Marital status			0.905
Married	38.4(8.3)	38(32-44)	
Single	38.3(7.7)	36(31-44)	
Divorced	38.6(7.2)	38(34-44)	
Children's			0.847
No	38.3(7.7)	38(33-42)	
Yes	38.4(8.1)	38(32-44)	
Job			0.706
Employed	38.7(7.9)	38(33-44)	
Retired	38.5(8.3)	38(31-44)	
	Spearman's Rho	**p-value**	
Age in years	-0.029	0.617	

Table 7b: Association between depression and women's medical history (n=300)

Medical history	**Mean ($\bar{X}$±SD)**	**Median (IQR)**	**p-value**
Cardiac disease history			0.006
Heart diseases (coronary heart disease, arrhythmias, valvular disease)	40.3(8.1)	40(34-46)	
Other history-non cardiac etiology	38.4(8.2)	38(32-44)	
Cardiac re-evaluation	35.3(6.3)	36(31-40)	
Symptoms			0.180
Cardiac symptoms (palpitations, angina, fatigue)	39.6(8.2)	40(34-45)	
Other symptoms-non cardiac etiology	38.1(8.0)	37(32-44)	
Normal menstruation			0.117
Yes	36.3(6.3)	36(31-41)	
No	38.7(8.2)	38(32-44)	
Climacteric			0.979
Yes	38.2(8.6)	39(33-43)	
No	38.4(8.0)	38(32-44)	
Menopause			0.349
Yes	38.6(7.9)	38(33-44)	
No	37.3(8.5)	36(31-44)	
Premature menopause			0.263
Yes	39.9(7.7)	41(38-45)	
No	38.3(8.0)	38(32-44)	
Polycystic ovaries			0.761
Yes	37.8(8.7)	37(31-45)	
No	38.3(7.9)	38(32-44)	
Contraceptives therapy			0.200
Yes	39.6(8.2)	39(34-45)	
No	38.0(7.9)	38(32-44)	
Pregnancy			0.837
Yes	38.1(6.8)	38(33-41)	
No	38.4(8.2)	38(32-44)	
Problems in pregnancy			0.724
Yes	38.5(7.9)	38(32-44)	
No	37.7(8.6)	39(30-43)	
Allergies history			0.088
Yes	39.4(7.6)	40(34-44)	
No	37.9(8.1)	37(32-44)	
Auscultation of the heart			0.714
Heart murmur	38.7(8.1)	38(32-44)	
No existence of heart murmur	38.2(8.1)	38(32-44)	
Carotid stenosis			0.630
Without stenosis	37.2(7.9)	37(30-40)	
Stenosis <50%	38.6(8.6)	36(32-44)	

Table 7c: Association between depression and performing laboratory tests (n=300)			
Laboratory tests	**Mean ($\bar{X}$±SD)**	**Median (IQR)**	**p-value**
Heart triplex			0.730
Yes	38.4(8.2)	38(32-44)	
No	38.4(8.0)	38(33-44)	
Carotid triplex			0.154
Yes	37.5(8.0)	37(31-41)	
No	38.7(8.1)	39(33-44)	
24hour heart monitoring (ECG holter)			0.683
Yes	39.0(8.6)	39(31-45)	
No	38.3(8.0)	38(32-44)	
24hour blood pressure monitoring (BP holter)			0.018
Yes	33.0(3.5)	32(30-36)	
No	38.6(8.1)	38(32-44)	
Planning for:			0.355
Cardiac triplex	38.0(8.2)	37(32-44)	
Carotid triplex	38.0(7.2)	38(32-43)	
24hour heart monitor-holter	38.2(8.5)	38(31-44)	
Stress test	38.7(7.9)	39(35-43)	

Table 7d: Association between depression and women's characteristics in the evaluation day (n=300)		
Day of cardiological evaluation	**Spearman's Rho**	**p-value**
Waist circumference	0.013	0.825
Hips circumference	0.003	0.955
Systolic blood pressure (SBP)	-0.019	0.752
Diastolic blood pressure (DBP)	-0.001	0.980
Oxygen saturation (SpO2%)	-0.023	0.692
Heart rate (bpm)	-0.085	0.143
Ejection fraction (n=127)	-0.010	0.908

Table 7e: Association between depression with age and characteristics of the menstrual cycle stage (n=300)

Menstrual cycle	**Spearman's Rho**	**p-value**
Onset age of menstruation (n=40)	-0.094	0.568
Onset age of climacteric(n=10)	0.401	0.251
Onset age of menopause (n=238)	-0.100	0.126

Table 8: Effect of women's characteristics on depression (n=300)

	b coefficient (95% CI)	**p-value**
Cardiac disease history		
Heart diseases (coronary heart disease, arrhythmias, valvular disease)	4.3(1.1-7.4)	0.008
Other history-non cardiac etiology	2.4(-0.3-5.1)	0.078
Cardiac re-evaluation	Ref.	
Allergies history		
Yes	2.2(0.1-4.2)	0.038
No	Ref.	
24hour ambulatory blood pressure monitoring (BP holter)		
No	6.0(0.9-11.2)	0.022
Yes	Ref.	