

# Prevalence and Assessment of Severity of Depression Among Ischemic Heart Disease Patients Attending Outpatient Cardiology Department Baghdad Teaching Hospital, Baghdad, Iraq

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## Abstract

**Background:** Depression and ischemic heart disease present a major comorbidity.

**Objective:** To determine the prevalence and to estimate the severity of depression, and some of socio-demographic variables among patients with ischemic heart disease.

**Methods:** A cross-sectional study conducted in Baghdad Teaching Hospital, Baghdad, Iraq. Study included all patients with ischemic heart disease excluding those with unstable medical illness. Socio-demographic variables, history of comorbid illnesses and complications were compiled. Self-Reporting Questionnaire (SRQ-20) to identify mental illnesses; DSM-IV criteria for depression and Hamilton-17 Scale for severity of depression, were used.

**Results:** A total of 271 patients were approached; 94.1% responded. About a half was having myocardial infarction (50.6%), stable angina (31.4%), and (18%) unstable angina. 45.1% had depression; 14.9% mild, 20% moderate, 7.06% severe, and 3.14% very severe depression. Depressed was significantly associated with age ( $P=0.008$ ), sex ( $P=0.000$ ), marital status ( $P=0.026$ ), occupation ( $P=0.000$ ), education ( $P=0.005$ ), income ( $P=0.000$ ), duration of ischemia ( $P=0.001$ ), comorbidity with other illnesses ( $P=0.000$ ), cardiac surgery ( $P=0.025$ ), and stressful life events ( $P=0.000$ ).

**Conclusion:** Depression is high among ischemic heart disease patients, significantly associated with demographic variables. Treating physicians and cardiologists need to be aware of this co-morbidity.

**Keywords:** Prevalence; Depression; Outpatient; Ischemic heart disease

## Introduction

The prevalence of depression in patients with coronary artery disease is between 19%-47% compared to 4%-7% in the general population [1]. Depression and Coronary Artery Disease (CAD) are both extremely prevalent diseases that compromised quality of life and life expectancy [2]. It has long been recognized that mild forms of depression are found in up to two thirds of patients in hospital after acute myocardial infarction (AMI), with major depression generally being found in about 15% of CVD patients [3]. There are a number of psychological reactions that can potentially occur after acute medical events. 13 Depressed moods is commonly experienced as a reaction to an acute coronary event, or for that matter to any illness or operation perceived to threaten one's life and well-being [4]. According to World Health Organization's (WHO) estimate, depression and cardiovascular disease will be the two major causes of disability-adjusted life years by the year 2020. According to the Diagnostic and Statistical Manual of Mental Disorders IV (DSM-IV), approximately 25% of the people with general medical conditions will become depressed during the course of their chronic condition [5]. The relationship between coronary heart disease (CHD) and major depressive disorder (MDD) has been investigated extensively over recent decades, as the prevalence of both conditions has risen around the world. Each condition remains a major contributor to the global burden of disease [6]. Though there are some inconsistencies in the literature, there are several established risk factors for depression in cardiac patients. Most studies have found that younger patients, women, and patients with premorbid histories of depression are more likely to have depression in the context of CVD. Among patients suffering from an acute coronary syndrome (ACS), social isolation and prior ACS, may also increase depression risk [7].

There is a clear consensus that depression is currently underdiagnosed in cardiac patients by cardiologists and primary care physicians alike. There is need for psychological intervention to manage and control the symptoms of depression in cardiovascular diseases in each and every cardiology units [8]. Due to the high prevalence, routine screening for depression in all patients with CHD is recommended when a patient first presents, and at the follow up appointment [3].

## Objectives

This study was conducted with an aim to determine the prevalence and to estimate the severity of depression, and some of socio-demographic variables among patients with ischemic heart disease attending outpatient cardiology department, Baghdad teaching hospital, Baghdad, Iraq.

## Patients and Methods

### Design and setting

This is a cross-sectional study with analytic component. It was

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conducted in Baghdad Teaching Hospital, Baghdad, Iraq. The data collection was done during the period March 1<sup>st</sup> 2011 to June 30<sup>th</sup> 2011.

### Study population and sampling technique

The study included patients attending the cardiology outpatient clinic at Baghdad teaching hospital during the data collection time. A systematic random sampling technique was applied, where every 3<sup>rd</sup> patient entering the clinic who accepts to participate in the study and to have the interview was selected.

### Inclusion criteria

All patients with ischemic heart disease of any age and sex who welcomed participation were included.

### Exclusion criteria

Current serious or unstable medical illnesses with severe chest pain or shortness of breath that cannot complete the interview were excluded.

### Data collection tools

Basic socio-demographic variables, diagnosing methods, history of comorbid illnesses and complications were compiled using a questionnaire filled through a direct interview. Mental status of the patient was assessed using the SRQ-20 scale (self-reporting questionnaires) that was developed by the WHO and used in many countries. According to previous studies conducted in Iraq, the cut-off point identified used to categories "potential psychiatric cases" and more generally persons with significant psychological distress was seven [9]. Those with positive results were assessed for the presence of depression using the DSM-IV criteria of depression [10]. Those with "depression" were further assessed for the severity of depression using the Hamilton scale. It contains 17 items to be rated (HRSD-17). Each item on the questionnaire is scored on a 3 or 5 point scale, depending on the item, and the total score is compared to the corresponding descriptor. It is accepted by most clinicians that scores between 0 and 6 do not indicate the presence of depression, scores between 7 and 17 indicate mild depression, scores between 18 and 24 indicate moderate depression, and scores over 24 indicate severe depression. A total HAM-D score of 7 or less after treatment is for most raters a typical indicator of remission [11].

### Definition of variables

The independent variables evaluated to explain depression were socio-demographics (age, gender, marital status, level of education, and occupation), smoking habits, characteristics of the disease, and comorbid condition or disease.

### Statistical analysis

Statistical package of social sciences (SPSS) version 15 was used for data entry and analysis. Categorical variables were tested using chi square test.  $P < 0.05$  was considered statistically significant.

### Ethical issue

Official approvals were granted from the officials in the study setting. Informed consent was obtained from each participant to be included in this study. Names were kept anonymous and interviews were conducted with full privacy.

### Limitations of the study

Random sampling was not applied to choose cardiology clinic.

The study was conducted in one cardiology clinic. Since this study is a cross-sectional study. Temporal relationship between depression and ischemic heart disease cannot be inferred. Similarly, selection bias cannot be excluded as the study was conducted in a specialized center.

### Results

A total of 271 ischemic heart disease patients were approached; 255 accepted to participate, giving a response rate of (94.1%). About 70.2% of the sample was male; 79.6% were married; 39.6% were still working; and about 75.3% had poor education. About 90% were live in urban than rural areas. Myocardial infarction 50.6%, stable angina 31.4%, and 18% were have unstable angina. Distribution by socio-demographic and ischemic heart disease participants characteristics are shown in Table 1.

The mean age of patients was ( $58.945 \pm 11.026$ ) years. The family size mean was ( $8.76 \pm 5.2$ ), crowding index mean was ( $3.07 \pm 4.21$ ), and the average ( $\pm$ SD) monthly family income was ( $533.3 \pm 56.9$ ) ID (Table 2).

The methods used in the diagnosis of ischemic heart disease were depend mostly on the sign and symptoms of chest pain and ECG changes (98.9%), admission to CCU (78.8%), other investigations like treadmill test (24.7%) and Echocardiograph study (6.6%) (Table 3).

The diagnosis of ischemic heart disease was associated with high comorbidity of other illnesses (72.5%). The majority show comorbidity with hypertension (50.9%), Diabetes Mellitus (33.7%), asthmatic bronchitis (1.56%), heart failure (9.4%), cerebrovascular accidents (3.1%), and duodenal ulceration (1.56%) (Table 4).

Nearly one third of the participants were smoker (33.3%), range 3-100 cigarettes per day, the most frequent is 10-40 cigarettes per day (26.3%). The sample shows 3.2% were alcohol drinker of regular drinking habits (Table 5).

More than half of the participants exposed to one of the major life events (54.5); 21.6% exposed to death of close relative; 7.9% death of spouse, 20.4% money loss, 18.9% serious illness or accidents and 0.8% exposed to job loss (Table 6).

All participants were on treatment; antiplatelet (95.3%), nitrate (93.4%), lipid lowering agents (67.9%), B-blocker (62.8%), ACE inhibitors (45.6%), diuretics (27.9%), calcium channel blocker (17.3%), angiotensin (7.6%), and anticoagulants (3.2%) (Table 7).

SRQ-20 positive responses were (145) (56.86%); stable angina (52) (63.4%), myocardial infarction (96) (53.4%), unstable angina (24) (52.1%) (Table 8).

Participants show 115 (45.1%) were met DSM-IV criteria of depressed; 51 (44.3%) of them were myocardial infarction, 42 (36.5%) stable angina, and 22 (19.1%) were unstable angina (Table 9).

The severity of depression was investigated by applying the Hamilton depression scale (HAMD-17) among positive DSM-IV criteria of depression found that; 38 (14.9%) mild depression, 51 (20%) moderate depression, 18 (7.06%) severe depression, and 8 (3.14%) very severe depression. Moderate and severe depression was more among myocardial infarction while very severe depression was among stable angina (Table 10).

Depressed ischemic heart disease participants were more among 51-60 years age group (32.2%), male (53%) compared with female (47%). Depression found more within married (74%), widowed (24.3%), and

		Classification of Ischemia						Total	%	P value
		stable angina		unstable angina		myocardial infarction				
		No.	%	No.	%	No.	%			
Age Groups	≤ 30 Years	0	0	0	0	4	3.1	4	1.6	0.083
	31 - 40 Years	2	2.5	0	0	6	4.7	8	3.1	
	41 - 50 Years	12	15	8	17.4	28	21.8	48	18.8	
	51 - 60 Years	20	25	20	43.5	35	27.1	75	29.4	
	61 - 70 Years	28	35	16	34.8	40	31	84	33	
	71 - 80 Years	16	20	2	4.3	14	10.8	32	12.5	
	81+ Years	2	2.5	0	0	2	1.5	4	1.6	
Sex	Male	42	52.5	34	73.9	103	79.9	179	70.2	0.000
	Female	38	47.5	12	26.1	26	20.1	76	29.8	
Marital Status	Single	6	7.5	0	0	0	0	6	2.4	0.000
	Married	52	65	38	82.6	113	87.6	203	79.6	
	Widowed	22	27.5	8	17.4	16	12.4	46	18	
Occupation	unemployed	2	2.5	6	13	6	4.6	14	5.5	0.000
	Gov. Work	4	5	6	13	12	9.3	22	8.6	
	Private Work	12	15	16	34.8	41	31.8	69	27.1	
	Military	2	2.5	0	0	8	6.2	10	3.9	
	Retired	24	30	8	17.4	40	31	72	28.2	
	Housewife	36	45	10	21.8	22	17.1	68	26.7	
Education	Illiterate	34	42.5	12	26.1	30	23.2	76	29.8	0.031
	Primary	26	32.5	26	56.5	64	49.6	116	45.5	
	Secondary	10	12.5	6	13	22	17.1	38	14.9	
	university	10	12.5	2	4.4	13	10.1	25	9.8	
Total		80	100%	46	100%	129	100%	255	100%	

Table 1: Show the socio-demographic characteristic features of the participants according to the type of ischemia.

Variables	N	Mean	Median	Std. Deviation
Age	255	58.94	60.00	11.02
Family size	255	8,76	8.00	5.20
Crowding Index	255	3.07		4.21
Monthly family income (ID)	255	533302	360000.00	569512.8

Table 2: Mean, median and standard deviation of some sociodemographic features of the sample.

Way of Diagnosis		Classification of Ischemia			Total	P value
		stable angina	unstable angina	myocardial infarction		
chest pain	Negative	0	0	3	3	0.227
	Positive	80	46	126	252	
ECG changes	Negative	0	0	3	3	0.227
	Positive	80	46	126	252	
CCU admission	Negative	34	4	16	54	0.000
	Positive	46	42	113	201	
Treadmill Test	Negative	60	40	92	192	0.107
	Positive	20	6	37	63	
Catheterization	Negative	48	26	67	141	0.514
	Positive	32	20	62	114	
Echo Study	Negative	68	44	126	238	0.001
	Positive	12	2	3	17	
Total		80	46	129	255	

Table 3: The way of diagnosis of ischemic heart disease among the study participants.

single (1.7%). Regarding the occupation founded that house wife form 41.7% of the depressed participants, while retired (24.3%), private work (21.7%), and unemployed (7%). Depression founded more among low educated participants; illiterate (43.5%) and primary school (41.7%) (Table 11).

Of the 115 (45.1%) depressed participants; myocardial infarction

(44.3%), stable angina (36.5%), and unstable angina (19.1%). the correlation between the degree of depression and the type of ischemia was of highly statistical significant (Tables 12 and 13).

Depressed participants were of mean age  $\pm$  SD = 58.945  $\pm$  11.02 years, the monthly income by Iraqi dinar = 533.301  $\pm$  56.951. The living circumstances at the home atmosphere; the number of persons at one

		Classification of Ischemia			Total	%
		stable angina	unstable angina	myocardial infarction		
Comorbidity	No	14	12	44	70	27.5
	Yes	66	34	85	185	72.5
HT	Negative	20	30	80	130	50.9
	Positive	60	16	49	125	49.1
DM	Negative	48	28	93	169	66.3
	Positive	32	18	36	86	33.7
Asthma	Negative	78	46	127	251	98.44
	Positive	2	0	2	4	1.56
HF	Negative	70	40	121	231	90.6
	Positive	10	6	8	24	9.4
CVA	Negative	74	44	129	247	96.9
	Positive	6	2	0	8	3.1
DU	Negative	80	44	127	251	98.44
	Positive	0	2	2	4	1.56
Total		80	46	129	255	100%

Table 4: The comorbidity with ischemic heart disease among study sample.

		Classification of Ischemia			Total	%
		stable angina	unstable angina	myocardial infarction		
SMOKING	No	60	36	74	170	66.6
	Yes	20	10	55	85	33.3
ALCOHOL	No	80	46	121	247	96.8
	Yes	0	0	8	8	3.2
Total		80	46	129	255	100%

Table 5: Smoking and alcohol drinking with ischemic heart disease among participants of the study.

		Classification of Ischemia			Total	%
		stable angina	unstable angina	myocardial infarction		
Life Events	Negative	30	42	62	116	45.5
	Positive	50	22	67	139	54.5
Death of close relative	Negative	58	36	106	200	78.4
	Positive	22	10	23	55	21.6
Death of Spouse	Negative	70	44	121	235	92.1
	Positive	10	2	8	20	7.9
Money Loss	Negative	62	38	103	203	79.6
	Positive	18	8	26	52	20.4
Job Loss	Negative	78	46	129	253	99.2
	Positive	2	0	0	2	0.8
Home Change	Negative	74	46	125	245	96.07
	Positive	6	0	4	10	3.93
Serious illness or accident	Negative	64	38	105	207	81.1
	Positive	16	8	24	48	18.9
Total		80	46	129	255	100%

Table 6: Stressful life events associated with ischemic heart disease among study sample.

		Classification of Ischemia			Total	%
		stable angina	unstable angina	myocardial infarction		
B Blocker	No	30	20	45	95	37.2
	Yes	50	26	84	160	62.8
Lipid Lowering Agents	No	32	16	34	82	32.1
	Yes	48	30	95	173	67.9
Nitrate	No	8	2	7	17	6.6
	Yes	72	44	122	238	93.4
ACE inhibitor	No	40	26	73	139	54.5
	Yes	40	20	56	116	45.6
Angiotensin	No	70	46	120	236	92.5
	Yes	10	0	9	19	7.6
Antiplatelet	No	2	4	6	12	4.7
	Yes	78	42	123	243	95.3

Calcium Channel Blocker	No	68	42	101	211	82.7
	Yes	12	4	28	44	17.3
Diuretics	No	52	28	104	184	72.1
	Yes	28	18	25	71	27.9
Anticoagulant	No	76	46	125	247	96.8
	Yes	4	0	4	8	3.2
Total		80	46	129	255	100%

Table 7: Type of medication taken by ischemic heart disease participants of the study.

		Classification of Ischemia						Total	
		stable angina		unstable angina		myocardial infarction			
SRQ Responses	Negative	28	11%	22	8.6%	60	23.5%	110	43.1%
	Positive	52	20.3%	24	9.4%	69	27.7%	145	56.9%
Total		80	31.3%	46	18%	129	50.5%	255	100%

Table 8: SRQ-20 positive and negative responses among ischemic heart disease participants of the study.

		Classification of Ischemia						Total	%
		stable angina		unstable angina		myocardial infarction			
Depression	No	38	14.9%	24	9.4%	78	30.5%	140	54.9%
	Yes	42	16.4%	22	8.6%	51	20%	115	45.1%
Total		80	31.3%	46	18%	129	50.5%	255	100%

Table 9: Depression among ischemic heart disease participants of the study.

		Classification of Ischemia						Total	%	P value
		stable angina		unstable angina		myocardial infarction				
HAMD Degree	Not done	38	14.9%	24	9.4%	78	30.5%	140	54.9	0.003
	Mild depression	16	6.2%	6	2.3%	16	6.2%	38	14.9	
	Moderate depression	14	5.4%	12	4.7%	25	9.8%	51	20	
	Severe depression	4	1.5%	4	1.5%	10	3.9%	18	7.06	
	Very severe depression	8	3.1%	0	0%	0	0%	8	3.14	
Total		80	31.3%	46	18.03%	129	50.5%	255	100%	

Table 10: The severity of depression among Ischemic heart disease patients obtained from HAMD-17 of the study sample.

		Degree of Depression				Total	%	P value
		Mild depression	Moderate depression	Severe depression	Very severe depression			
Age Groups	26 - 30 Years	2	0	0	0	2	1.7	0.003
	31 - 40 Years	0	0	2	0	2	1.7	
	41 - 50 Years	8	8	4	6	26	22.6	
	51 - 60 Years	10	21	6	0	37	32.2	
	61 - 70 Years	10	16	4	0	30	26	
	71 - 80 Years	8	4	2	2	16	14	
	81+ Years	0	2	0	0	2	1.7	
Sex	Male	24	27	10	0	61	53	0.014
	Female	14	24	8	8	54	47	
Marital Status	Single	0	2	0	0	2	1.7	0.107
	Married	32	33	16	4	85	74	
	Widowed	6	16	2	4	28	24.3	
Occupation	Unemployed	6	0	2	0	8	7	0.001
	Gov. work	0	4	0	0	4	3.5	
	Private Work	14	7	2	2	25	21.7	
	Military	0	0	2	0	2	1.7	
	Retired	6	16	6	0	28	24.3	
	Housewife	12	24	6	6	48	41.7	
Education	Illiterate	16	24	6	4	50	43.5	0.432
	Primary	14	20	10	4	48	41.7	
	Secondary	6	2	2	0	10	8.7	
	University	2	5	0	0	7	6.1	
Total		38	51	18	8	115	100%	

Table 11: Show the socio-demographic features according to the degree of depression which resulted from the HAMD-17.

		Depression		Total	P value
		no	Yes		
Age Groups	26 - 30 Years	2	2	4	0.338
	31 - 40 Years	6	2	8	
	41 - 50 Years	22	26	48	
	51 - 60 Years	38	37	75	
	61 - 70 Years	54	30	84	
	71 - 80 Years	16	16	32	
Sex	81+ Years	2	2	4	0.000
	Male	118	61	179	
Marital Status	Female	22	54	76	0.05
	Single	4	2	6	
	Married	118	85	203	
Occupation	Widowed	18	28	46	0.000
	Unemployed	6	8	14	
	Govt. work	18	4	22	
	Private work	44	25	69	
	Military	8	2	10	
	Retired	44	28	72	
	Housewife	20	48	68	
Education	Illiterate	26	50	76	0.000
	Primary	68	48	116	
	Secondary	28	10	38	
	University	18	7	25	
Total		140	115	255	

Table 12: Sociodemographic features of depressed ischemic heart disease participants of the study.

Classification of Ischemia		Degree of Depression				Total	%	P value
		mild depression	moderate depression	severe depression	very severe depression			
Ischemia	stable angina	16	14	4	8	42	36.5	0.006
	unstable angina	6	12	4	0	22	19.1	
	myocardial infarction	16	25	10	0	51	44.3	
Total		38	51	18	8	115	100%	

Table 13: The correlation between the degree of depression and the type of ischemic heart disease.

home was  $8.76 \pm 5.2$ , the number of rooms at one home was  $2.85 \pm 1.23$ . The duration of ischemic heart disease among depressed participants was  $53.38 \pm 68.746$  months. About 33.3% of the sample was smokers and 32.3% of depressed participants were smokers with number of cigarette per day  $11.435 \pm 19.754$  cigarettes (Tables 14 and 15).

Depressed ischemic heart disease participants show highly significant comorbidity with other diseases. Table 16 show the comorbidity and the statistical significant of the findings.

Depressed ischemic heart disease participants show highly significant association with stressful life events ( $P=0.000$ ). About 54.5% of the whole participants and about 80% of depressed participants have at least one major life event (Table 17).

Depressed participants of ischemic heart disease patients were of medication either for the ischemia or for comorbidity of other illnesses. Table 18 shows some of the medication that taken by the participants currently and the statistical significance with depression.

More than 90% of ischemic heart disease patients were live in urban areas than rural areas. All the participants were of negative family history of depression. 2.4% of the participants were underwent cardiac surgery and no one of them was depressed ( $P=0.025$ ) (Table 19).

## Discussion

The study shows response rate of 94.1%. It was similar rates of participation with Salman 2009 (93.6%) [12] and Iraqi family health

survey (IFHS) (95%) [13]. It was high rate since most of Iraqi people like sharing talk about their conditions where they feel someone take care of them. The other 5.9% have an excuse not to participate; they feel shame, just in hurry, or have no time.

Participants show (56.86%) positive responses to SRQ-20. It is higher than many Iraqi studies; Salman 2009 (36.81%) [12], Muffed et al. (one third) [9], Iraqi mental health survey IMHS (7.14%) [14], Iraqi family health survey (IFHS) (35.5%) [13]. High SRQ-20 positive responses may be explained that, Iraqis have witnessed many internal and external conflicts during the past three decades, including three wars and 12 years of sanctions. Since 2003, violence has been increasing throughout the country. These circumstances have affected the Iraqi population in every domain of life with varying degrees of repercussion. This population can be considered as having significant psychological distress and potential psychiatric cases.

Current study founded Depression was 45.1% of participants with ischemic heart disease. It is higher than; Fraz K et al. 27% [5], Liang JJ et al. 33% [14], Raj HSS and Sajimon PP (36.68%) [8] Iraqi mental health survey (IMHS) 2006/7 [9] (severe depression 3.50%, moderate depression 2.83% and mild depression 1.15%), Najeb GT [15] 38.67%, and Lawson R et al. [16] 38%. WHO educational program on depression, founded depression is 33% among patients with ischemic heart [17]. Leegte IL et al. [18] founded 41% percent of Netherlands sample had depression. Whooley MA (20%) [19]. Kemp DE et al. [20]

	Mean	± SD	Depression		Total	P value
			NO	YES		
Age	58.945	11.02	140	115	255	0.007
Income ID	533.301	56.951	140	115	255	0.000
No. of Persons	8.76	5.2	140	115	255	0.000
No. of Rooms	2.85	1.23	140	115	255	0.020
Duration of illness in Months	53.38	68.746	140	115	255	0.001
No. of Cigarette per day	11.435	19.754	140	115	255	0.05

Table 14: Some sociodemographic variables of depressed participants with their statistical significant.

		Depression		Total
		NO	YES	
SMOKING	No	92	78	170
	Yes	48	37	85
ALCOHOL	No	134	113	247
	Yes	6	2	8
Total		140	115	255

Table 15: Sociodemographic variables of depressed participants with their statistical significant.

		Depression		Total	P value
		NO	YES		
Co Morbidity	NO	54	16	70	0.000
	YES	86	99	185	
HT	Negative	86	44	130	0.000
	Positive	54	71	125	
DM	Negative	104	65	169	0.003
	Positive	36	50	86	
Asthma	Negative	138	113	251	0.843
	Positive	2	2	4	
HF	Negative	132	99	231	0.026
	Positive	8	16	24	
CVA	Negative	134	113	247	0.246
	Positive	6	2	8	
DU	Negative	138	113	251	0.843
	Positive	2	2	4	
Total		140	115	255	

Table 16: Comorbidity and statistical significant among depressed ischemic heart disease participants.

		Depression		Total	P value
		NO	YES		
Life Events	No	92	24	116	0.000
	Yes	48	91	139	
Death of close relative	Negative	126	74	200	0.000
	Positive	14	41	55	
Death of Spouse	Negative	130	105	235	0.646
	Positive	10	10	20	
Money Loss	Negative	124	79	203	0.000
	Positive	16	36	52	
Job Loss	Negative	138	115	253	0.198
	Positive	2	0	2	
Home Change	Negative	138	107	245	0.024
	Positive	2	8	10	
Serious illness or accident	Negative	124	83	207	0.001
	Positive	16	32	48	
Total		140	115	255	

Table 17: Major life events among depressed participants and the statistical significant.

Treatment		Depression		Total	P value
		NO	YES		
B-Blocker	No	60	35	95	0.041
	Yes	80	80	160	
Lipid Lowering Agents	No	44	38	82	0.784
	Yes	96	77	173	
Nitrate	No	14	3	17	0.019
	Yes	126	112	238	
ACE inhibitor	No	76	63	139	0.937
	Yes	64	52	116	
Angiotensin	No	132	104	236	0.244
	Yes	8	11	19	
Antiplatelet	No	4	8	12	0.124
	Yes	136	107	243	
Calcium Channel Blocker	No	114	97	211	0.539
	Yes	26	18	44	
Diuretics	No	102	82	184	0.783
	Yes	38	33	71	
Anticoagulant	No	132	115	247	0.009
	Yes	8	0	8	
Total		140	115	255	

Table 18: Medications taken by depressed participant and the degree of statistical significant with depression.

		Depression		Total		P value
		NO	YES	No.	%	
Residence	Urban	130	103	233	91.3%	0.352
	Rural	10	12	22	8.7%	
Family Hx Of Depression	No	140	115	255	100%	--
Heart Surgery	No	134	115	249	97.6%	0.025
	Yes	6	0	6	2.4%	
Total		140	115	255	100%	

Table 19: The statistical significance of some variables with the diagnosis of depression.

founded the prevalence of depression 40%.

The prevalence of depression among ischemic heart disease patients of the current study was lower than; Carney (65%) [21], Pena FM et al. (67%) [22], Polikandrioti M et al. (65.4%) [23], Rosenthal MH (45%) [24], Manica et al. (45%) [25].

Many study founded wide range of depressive disorder among ischemic heart disease patients; Hwang B and Choi H founded the prevalence of depression ranged from 24% to 68% [26]. Huffman JC (15%-20%) [7] Rudisch and Nemeroff (17-27%) [27], Thomas SA et al. (13%-77.5%) [28], Shastri PC (40-65%) [29], Rao M (30% to 40%) [30], Blumental JA (14%-47%) [31].

Regarding the severity of depression, HAMD-17 was applied on the DSM-IV positive respondents ischemic heart disease patients showed 14.9% have mild depression, 20% have moderate depression, 7.06% severe depression and 3.14% very severe depression. The degree of severity of depression is highly significant correlation with the type of ischemic heart disease (P=0.003). Type of ischemia is highly statistical significant correlated with severity of depression (P=0.006). Faur A founded mild depression 17.4%, moderate depression 52.4%, severe depression 15.5, and very severe depression 14.5% [1]. IMHS 2006/7 [9] showed life time prevalence of severe depression 3.50%, moderate depression 2.83%, and mild depression 1.15%. Pena FM et al. [22], studied sample of 103 patient in Brazil founded that 69 (67%) were depressed; 35(34%) had mild depression, 22 (21.3%) had moderate depression, and 12 (11.6%) patients presented with severe depression. Polikandrioti M et al. [23] showed that 34.6% absence of depression,

27.3% mild depression, 20.9% moderate depression and 17.2% severe depression

### Age

Most of the sample (93.7%) where aged above 40 years. mean age 58.945 ± 11.02 years. More than 63% of depressed patients were of 51-70 years age group. The age group is highly significant correlation with the degree of depression (P=0.003). Since this period of age was at high risk for ischemic heart disease than other extremes, they have enough time for regular consultations, and they have high social supports from their families helping them for regular follow up of their health status. Pena FM et al. [22] founded the mean age was 65.4 years. Najeb GT [15] the mean age was 53.9 ± 791. Polikandrioti M et al. [23] founded 23.0% were between 50-59 years. Rothenbacher D et al. [32] founded that the largest proportion of subjects with increased symptom scores were found in the age categories 40-49 and 50-59 years (P=0.0003 and P=0.01, respectively).

### Gender

Male was about 70% of participants while female was about 30%. Male depressed participants were 53% and female were 47%. The gender is highly statistical significant correlation with the degree of depression (P=0.014). Fraz K et al. founded 19.7% males and 7.5% females [5] Polikandrioti M et al. [23] founded 79.1% were male and only 20.9% patients were female. Najeb GT [15] founded male 62.1% and female 37.9% of depressed participants. Pena FM et al. [22] 36.9% were male and 63.1% were female. Vural et al. [33] founded that female patients had higher scores of depression.



### Marital status

About 80% of sample and more than 75% of depressed were married. Marital status is significant statistical correlation with the diagnosis of depression ( $P=0.05$ ). Najeb GT [15] founded that 69% were married than 31% were single. Polikandrioti M et al. [23] founded that 72.2% were married. Pena FM et al. [22] founded 49.5% were married. Dowlati Y et al. [34], founded that there was significant statistical correlation of married status (married) with depression.

### Occupation

House wife, the occupation that never be retired unless be disabled, form 41.7%, retired 24.3%, private work 21.7% among depressed ischemic heart disease patients. The occupation is highly statistical significant correlation with the diagnosis of depression ( $P=0.001$ ) and the degree of severity of depression ( $P=0.000$ ). Najeb GT [15] founded 53.4% not employed, 20.7% private work and 12% retired. Polikandrioti M et al. [23] founded higher levels of depression were observed for those retired ( $p=0.028$ ).

### Education

About 75% of the sample and about 85% of depressed ischemic heart disease patients were of low educational level or illiterate. The level of education of ischemic heart disease patients is of statistically significant correlation with the diagnosis of depression ( $P=0.000$ ). Polikandrioti M et al. [23] founded that 47.5% of participants had received only basic education, 25.2% had received high school education, 27.3% had attended some college or university. Pena FM et al. [22] only 26.2% were illiterate. Najeb GT [15] founded 46% illiterate, about 70% of low education.

### Income

All participants and depressed ischemic heart disease patient (100%) were have monthly income =  $533.301 \pm 56.951$  Iraqi dinar. The income is highly statistical significant correlation with depression among ischemic heart disease patients ( $P=0.000$ ). Pena FM et al. [22] founded 43.7% have monthly income. Duration of ischemic heart disease: Current study founded Depression with ischemic heart disease of duration mean of 5 years ( $53.38 \pm 68.746$  months), range from one month to 30 years. The duration of ischemic heart disease is statistically significant correlated with depression ( $P=0.001$ ).

### Comorbidity

86.1% have comorbidity. Statistically significant comorbidity with depression were; hypertension (61.7%) ( $P=0.000$ ), diabetes mellitus (43.4%) ( $P=0.003$ ), and heart failure (13.9%) ( $P=0.026$ ). Pena FM et al. [23] founded 92.2% hypertension and 34% diabetes mellitus.

### Life events

About 80% of depressed ischemic heart disease patients have at least one major life event. The life events were statistically significant correlation with depression ( $P=0.000$ ). Significant life events were; death of close relative (35.6%) ( $P=0.000$ ), loss of money (31.3%) ( $P=0.000$ ), changing home or displaced (6.9%) ( $P=0.024$ ), and serious illness or accidents (27.8%) ( $P=0.001$ ). Michael AJ et al. [35] founded that 32% of psychiatric illness attributed to stressful life events. Michael AJ et al. [36]. Founded that 25-26% of the patients had life events.

### Medications

Depressed ischemic heart disease patients were of medication for

the ischemia. Statistically significant correlation with depression was; B-blocker ( $P=0.041$ ), nitrate ( $P=0.019$ ), and anticoagulant ( $P=0.009$ ). Dowlati et al. [34] founded no significant statistical correlation of medications (B-blockers and ACE inhibitors) with depression. Vural et al. [33]. Founded that Statin usage (47.5% of all patients) was not associated with increased depression scores.

### Smoking

About 32.1% of depressed ischemic heart disease patients were smokers. Number of cigarettes per day was  $11.435 \pm 19.754$  ( $P=0.05$ ). Pena FM et al. [22] founded 35% were smokers.

### Alcohol

Only 1.7% of depressed ischemic heart disease patients were alcoholics on regular pattern. Alcohol consumption was statistically not significant ( $P=0.246$ ). Pena FM et al. [22] founded 21.4% were alcoholics.

### Residence

More than 90% were live in the urban than rural areas. These finding were statistically investigated show no significant correlation with depression ( $P=0.352$ ). Polikandrioti M et al. [23] founded; urban 34.5% and rural 23.7. Herva A [36] founded the prevalence of major depressive disorder was 4.7% among urban subjects, and 4.1% among rural subjects.

### Family history

All participants (100%) were of negative family history of mental illness. No statistical value obtained.

### Heart surgery

Six (2.3%) underwent surgical procedures. No one of them was depressed according to DSM-IV criteria for depression. This finding is statistically significant ( $P=0.025$ ).

### Conclusion

Current study shows high prevalence of depression (45.1%) among out-patient ischemic heart disease patients. Depressed ischemic heart disease patients were of statistically significant correlation with age, sex, marital status, occupation, education, income, and duration of ischemia, comorbidity with other illnesses, cardiac surgery, and stressful life events.

With lack of mental health services, this issue is more important for the general practitioners and cardiologists to understand the importance of risks of untreated depression in ischemic heart disease patients. Complicating this picture is the prevailing social stigma associated with mental illness in Iraq.

Review of studies found that the association between current heart disease and prevalence of major depression was fairly consistent across many countries and cultures in Europe, the Americas, the Middle East, Africa, and Asia.

### Recommendations

In the face of high prevalence of depression among ischemic heart disease patients, educate the public and raising awareness of the healthcare providers is recommended.

Important future research directions including the need of Large-scale, prospective studies in patients with ischemic heart

disease to improve understanding of the reciprocal effects between depression, ischemic heart disease, and symptom burden, functional impairment, and self-care regimens. Large, randomized, controlled studies are needed in representative populations with ischemic heart disease and major depression to test the effect of enhancing quality of depression care and improving outcomes of depression on symptom burden, function, self-care activities, direct and indirect costs, medical complications, and mortality. Research is needed to determine which treatment is most effective and whether the treatment of depression will improve morbidity and mortality in patients with ischemic heart disease and depression.

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