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DETERMINANT AND SEVERITY OF INFERTILE COUPLES' DEPRESSION: A CROSS-SECTIONAL STUDY

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ABSTRACT

Background: Infertility that affects 10 to 15% of couples is a psychological, social and medical problem. *Objectives:* assessment of prevalence and severity of depression among infertile couples and the significant correlation of depression with sociodemographic and clinical variables. *Methods*: A cross-sectional study conducted in Imamain Kadhimain Medical City, Baghdad, Iraq. Study included all couples with primary and secondary infertility. Socio-demographic and clinical variables were compiled. Self-Reporting Questionnaire (SRQ-20) to identify mental illnesses; DSM-IV-TR criteria for depression and Hamilton-17 Scale for severity of depression, were used.*Results*: Total couples completed the interview were 227 couples. Participation rate was 85%. About 70.5% of the couples have primary infertility, 29.5% secondary infertility. Husband with depression was (63.9%) and wives with depression

(83.3%).Most of husbands were mild to moderate depression (46.7%) and most of wives were severe to very severe depression (46.7%). Types of infertility were statistically significant correlation with depression of wives (*P=0.042*) and the degree of severity of depression of wives (*P=0.010*), rather than depression of husbands (*P=0.203*) and the severity of depression of husbands (*P=0.320*). *Conclusion*: study found high prevalence of depression among infertile couples with statistical significant correlations with many sociodemographic and clinical variables.

Keywords: depression; infertility; SRQ20; HAM17; Iraq

***Abbreviation*: *WHO*: World Health Organization, *SRQ-20*: self- reporting questionnaires, *DSM-IV-TR*: diagnostic and statistical manual-forth revision-text revised, *HRSD-17* and *HAM-D*: Hamilton rating scale of depression, *BMI*: body mass index, *SPSS*: Statistical package of social sciences, *ID*: Iraqi dinners**

INTRODUCTION

Infertility that affects 10 to 15% of couples is a psychological, social and medical problem[1].Infertility is a condition in which pregnancy has not occurred after one year of unprotected, well-timed intercourse[2]. Infertility reportedly affects about 13–15% of couples worldwide[3], and between 60 million and 168 million people globally[4]. World Health Organization (WHO) recognizes infertility to be a worldwide health issue[5]. Male and female partners are individually responsible for 40% of infertility cases, while in the remaining 20%, both male and female partners are involved[6].Infertility affects between 80 and 168 million people worldwide[7]. Although the prevalence of fertility problems is similar nationwide, the individual impact of having such a condition varies greatly, especially from a psychological prospective[8]. Cultural perceptions of parenthood, role identity, and religious influence give infertility its significance; therefore, these factors can all determine the level of psychosocial strain[9]. In the Arabic world, family unity and parenting continue to be a core value that is held in high esteem[10]. The estimated prevalence of mental health problems ranges from 30% to 80% as reported in different studies[11]. World Health Organization (WHO) defined depression as one of the common mental disorder, characterized by psychological and physiological symptoms that interfere with job and enjoying life[12]. The psychological symptoms include fluctuation of mood, loss of interest, sadness, or pleasure, feelings of guilt or low self-worth, poor concentration feeling sad and blues.

Physiological symptoms include disturbed sleep, loss of appetite, headache, fatigue, back pain, and dizziness[13]. People experiencing fertility problem are almost twice as likely to suffer from depression as the general population. Depression significantly affects the quality of life of infertile couples and consequently, these disorders deserve more clinical attention[14]. Infertile couples experience chronic stress each month in case of the failure of fertilization[15]. Several researchers have claimed that in the presence of stressors, women use concentrated confrontation on excitement more often compared to men[16]. The findings of one study in this regard indicated that 48% of infertile women and 23.8% of infertile men suffered from depression, while 44% of infertile women were diagnosed with psychological disorders[15]. There are studies showing that both infertility and its treatment can cause depression[16]. The rate of mild depression in females in infertility treatment varies from 12.0% to 54.0% [17]. In another study, 40.2% of people that have infertility treatment suffer from psychiatric diseases. Major depression follows with 17.0% and dysthymia with 9.8% [18]. In the present study, the prevalence and severity of depression in infertile couples was explored and the significant correlation of depression and sociodemographic and clinical variables was assessed.

PATIENTS AND METHODS

Design and setting: This analytic cross-sectional study conducted on infertile couples attending Um Al-Baneen fertility center, Imamain Kadhimain Medical City, Baghdad, Iraq. Data collected during the period February, 1st, 2014 to March, 1st, 2016.

Study Population and Sampling Technique: The study included couples attending the fertility center during the data collection time. A systematic random sampling technique was applied, where every 3rd patient entering the center who accepts to participate in the study and to have the interview was selected. **Inclusion criteria**: all couples with complaints of failure to achieve conception after at least a year of adequate unprotected heterosexual coitus, whether or not they had had a child previously (primary or secondary infertility) of any age who welcomed participation were included. **Exclusion criteria**: Women with history of inability to conceive of less than12 months, current serious or unstable medical illnesses that cannot

complete the interview, not cooperative, and who did not give their consent to participate were exclude from the study. **Data collection Tools**: basic socio-demographic variables, duration of marriage, duration of consultation, times of consultation, and other habitual trends and clinical characteristics of the couples were compiled using a questionnaire filled through a direct interview. Mental status of the couples 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[19]. Those with positive results were assessed for the presence of depression using the DSM-IV-TR criteria of depression[20]. 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[21].

Definition of variables: The independent variables evaluated to explain depression were socio-demographics (age, age difference, level of education, occupation, religious status, and BMI), smoking habits, characteristics of the couples; duration of marriage, duration of consultation, times of consultation, medication, radiological investigation, and surgical intervention. **Statistical Analysis**: Statistical package of social sciences (SPSS) version 19 was used for data entry and analysis. Categorical variables were tested using chi square test. $P<0.05$ was considered statistically significant. **EthicalIssue**: 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 fertility center. The study was conducted in one fertility center. Since this study is a cross-sectional study, temporal relationship between depression and infertility cannot be inferred. Similarly, selection bias cannot be excluded as the study was conducted in a specialized center.

RESULTS

Total couples approached were 266. These complete the interview was 227 couples. Other not complete the interview or not fulfil the questionnaire were omitted. Participation rate was 85%.

Sociodemographic characteristics of the couples:

The age of husbands was 33.2±9.6 years. About 60% were below 35 years. The age of wife was 28.3±7.1 years. About 80% were below 35 years. The age difference was 5.9±4.2. About 70% of couples were of low education. Husbands have their own work (free work) more than 50%. Most of wives were house wife 97.4%. About 50% of couples were moderately religious (Table 1).

Husband with positive family history of infertility about 16% and the wives 7.5%.

BMI of husbands was 28.7±5.7, BMI of wives was 28±5.47. The monthly income was 584140±309709 ID. About half was live with big family 55%, the rooms for each couple was 4.9±3.8, and the number of family members was 3.5±2.6. The duration of infertility was 6.9±4.5 years. The duration of consultation was 4.5±4.4 years. Times of consultation for treatment were 11.2±7.8 (Table 2)

Husbands' first marriage were 95%, and for wives about 97%. About 50% of husbands were smokers and about 2% were alcoholics while just 5% of wives were smokers. A chronic illness was; husbands 15.9%, wives 6.6%. About 55% of husbands received medication and treatments while 93% of wives were on different medications and treatments. Those exposed to surgical procedures were; husbands 22.5%, and wives 26.4%. About 30% of husbands were exposed to radiological investigations, while wives 79.3%.

About 95% of couples were supportive for each other, 5% adopted child, 79% have sexual knowledge, 30% uses lubricant during sexual intercourse. Nearly 11% of husbands wear tight clothes, while wives 30%. About 60% of couples were use hot water path. Husbands work in hot climate 30% and

wives 10%. Animal rearing and dealers were; husbands 23% and wives 9% (Table 3).

Depression and severity of depression

Positive responses to SRQ-20 were 63.9% of husband and 83.3% of wives. All husband with positive SRQ-20 responses were met the DSM-IV criteria of depression (63.9%) and all wives with positive responses were met the DSM-IV criteria of depression (83.3%). When assessing the severity of depression by Hamilton Depression Scale; Most of husbands were mild to moderate depression (46.7%) and most of wives were severe to very severe depression (46.7%) (Table 4).

There is a significant correlation between depression and sociodemographic characteristics; the education of husband (*P=0.004*) and wife (*P=0.001*), the religion of husband (*P=0.003*) and wife (*P=0.005*), the occupation of husband (*P<0.001*) and the BMI of wife (*P=0.001*) (Table 5).

The sexual knowledge and information of husband (*P=0.013*) and wife (*P<0.001*), smoking of wife *(P=0.002*), working in hot sitting wife (*P=0.031*), child adoption *(P=0.007*), and husband wearing tight clothes (*P=0.019*) (Table 6).

Husband depression of significant correlation with; age difference (*P<0.001*), the duration of consultation (*P=0.002*), and the times of consultation (*P=0.008*), while the depression of wife correlate significantly with; monthly income (*P=0.026*), age difference (*P<0.001*), the duration of marriage (*P=0.003*), and the times of consultation (*P=0.004*) (Table 7).

The degree of severity of depression was significantly correlated with age, education, occupation, religion, and BMI of both couple (Table 8, 9).

The degree of severity of wife depression was significantly associated with family history of infertility (*P=0.006*), taking medication (*P=0.001*), smoking habit (*P<0.001*), history of exposed to life events (*P=0.041*), supporting wife (*P=0.027*), sexual knowledge (*P<0.001*), hot water path(*P=0.025*), working in hot sitting(*P=0.001*), child adoption(*P=0.005*), and rearing animals(*P<0.001*) (Table 10).

The severity of husband depression was significantly associated with; family history of infertility (*P<0.001*), husband chronic illness (*P=0.024*), history of taking medication (*P<0.001*), exposed to surgical procedures

(*P=0.007*), exposed to radiological investigations (*P=0.047*), alcoholism (*P=0.020*), life events (*P=0.034*), child adoption (*P<0.001*), tight clothes (*P=0.010*), hot water path (*P=0.031*), working in hot sitting (*P=0.066*), and first or multiple marriages (*P=0.006*) (Table 11).

The degree of severity of wife depression was significantly associated with; monthly income (*P<0.001*), the age difference between husband and wife (*P<0.001*), the marriage duration (*P=0.017*), the consultation duration (*P<0.001*), and the times of consultation (*P<0.001*) (Table 12).

The degree of severity of depression was significantly associated with the age difference between the husband and wife (*P<0.001*), the duration of consultation (*P<0.001*), and the times of consultation (*P<0.001*) (Table 13).

Types of infertility:

About 70.5% of the couples have primary infertility, 29.5% secondary infertility. Infertility types were of significant correlation with sociodemographic features of the couples; age groups (*P<0.001*), education (*P<0.001*), and religion (*P=0.001*). Types of infertility were significantly correlated with BMI of females (*P<0.001*) (Table14).

The correlation of types of infertility with other habits and clinical variables; life events of couples (*P=0.031*), working in hot climates (*P=0.002*), smoking; males (*P=0.004*), females (*P=0.021*), males chronic illness (*P=0.025*), males medication (*P=0.044*), supporting males (*P=0.001*), males rearing animals (*P=0.050*), and males remarriages (*P=0.028*). Females factors significantly correlated with types of infertility; surgical procedures (*P<0.001*), wearing tight clothes (*P<0.001*), and hot water path (*P=0.001*). (Table15)

Types of infertility were of significant correlation with the age differences between male and female (*P<0.001*), the duration of marriage (*P<0.001*), and the duration of consultation (*P=0.016*). (Table16)

Types of infertility were statistically significant correlation with depression of females (*P=0.042*) and the degree of severity of depression of females (*P=0.010*), rather than depression of males (*P=0.203*) and the severity of depression of males (*P=0.320*) (Table 17).

Table 1: the sociodemographic characteristics of couples involved in the study

		Men		Women	
		Frequency	Percent	Frequency	Percent
Age Group	16-25 yrs	49	21.6	90	39.6
	26-35 yrs	86	37.9	96	42.3
	36-45 yrs	65	28.6	41	18.1
	> 45	27	11.9	0	0
Education	Illiterate	25	11.0	15	6.6
	primary school	78	34.4	89	39.2
	intermediate school	50	22.0	38	16.7
	secondary school	22	9.7	16	7.0
	Institute	31	13.7	37	16.3
	College	15	6.6	32	14.1
	Postgraduate	6	2.6	0	0
Occupation	free work	128	56.4	0	0
	Employed	67	29.5	6	2.6
	Military	26	11.5	0	0
	Student	6	2.6	0	0
	house wife	-	-	221	97.4
Religion	Nil	40	17.6	40	17.6
	Mild	37	16.3	37	16.3
	Moderate	115	50.7	115	50.7
	Sever	35	15.4	35	15.4
BMI	BMI < 25	72	31.7	94	41.4
	BMI 25-30	84	37.0	51	22.5
	BMI > 30	71	31.3	82	36.1
Total		227	100.0	227	100.0

Table 2: calculation of some variables of the families participate in the study

Total (227)	Mean	SD
Men Age (years)	33.2863	8.65678
Women Age (years)	28.3744	7.11386
Age difference (years)	5.9251	4.21214
Income monthly (ID)	584140.9692	309709.45197
Height men(cm)	171.7974	8.29454
Height women (cm)	161.6476	6.81221
Weight Men (kg)	84.7269	17.18575
Weight women (kg)	73.0220	14.91849
BMI_Men	28.7660	5.72160
BMI_Women	28.0016	5.47382
Marriage duration(years)	6.9119	4.52732
Consultation duration years	4.5022	4.40673
Consultation times	11.2159	7.86569
House Room number	4.9868	3.88266
House family members	3.5242	2.62613

Table 3: comparison of infertile couples' characteristics features

	Men (227)		Women (227)	
	Frequency	Percent	Frequency	Percent
Family History	36	15.9	17	7.5
Chronic illness	36	15.9	15	6.6
Medication	125	55.1	212	93.4
Surgical procedures	51	22.5	60	26.4
Radiological investigation	68	30.0	180	79.3
Smoking	108	47.6	12	5.3
Alcohol	5	2.2	0	0
Life events	131	57.7	131	57.7

	Men (227)		Women (227)	
	Frequency	Percent	Frequency	Percent
Family History	36	15.9	17	7.5
Supporting	212	93.4	217	95.6
Child adoption	12	5.3	12	5.3
Sexual Knowledge	179	78.9	179	78.9
Lubricant use	67	29.5	67	29.5
Tight clothes	26	11.5	68	30.0
Hot water path	131	57.7	137	60.4
Work sit hot	66	29.1	21	9.3
Animal rearing	52	22.9	20	8.8
first marriage	216	95.2	221	97.4
second marriage	11	4.8	6	2.6

Table 4: depression and the degree of severity of depression among infertile couple involved in the study

		Men		Women	
		Frequency	Percent	Frequency	Percent
SRQ_20	Negative	82	36.1	38	16.7
	Positive	145	63.9	189	83.3
DSM	None Depressed	82	36.1	38	16.7
	Depressed	145	63.9	189	83.3
HAM DEPDEGREE	Mild Depression	70	48.3	53	28.04
	Moderate Depression	36	24.8	30	15.87
	Severe Depression	22	15.2	60	31.75
	Very Severe Depression	17	11.7	46	24.34

Table 5: statistical significant correlation of depression with sociodemographic characteristics of the couples involved in the study

		Men 227					Women 227				
		Non depressed (82)		Depressed (145)		P value	Non depressed (38)		Depressed (189)		P value
		No	%	No	%		No	%	No	%	
Age Group	16-25 yrs	13	15.9	36	24.9	0.152	12	31.6	78	41.3	0.362
	26-35 yrs	31	37.8	55	37.9		20	52.6	76	40.2	
	36-45 yrs	30	36.6	35	24.1		6	15.8	35	18.5	
	> 45	8	9.7	19	13.1		0	0	0	0	
Education	Illiterate	9	11	16	11	0.004	5	13.2	10	5.3	0.001
	primary school	27	33	51	35.2		11	28.9	78	41.3	
	intermediate school	17	20.7	33	22.8		11	28.9	27	14.3	
	secondary school	5	6.1	17	11.7		6	15.8	10	5.3	
	Institute	16	19.5	15	10.3		5	13.2	32	16.9	
	College	2	2.4	13	9		0	0	32	16.9	
	Postgraduate	6	7.3	0	0		0	0	0	0	
Occupation	free work	29	35.4	99	68.3	0.000	0	0	0	0	0.266
	Employed	33	40.2	34	23.4		0	0	6	3.2	
	Military	14	17.1	12	8.3		0	0	0	0	
	Student	6	7.3	0	0		0	0	0	0	
	house wife	-	-	-	-		38	100	183	96.8	
Religion	Nil	17	20.7	23	15.8	0.003	5	13.2	35	18.5	0.005
	Mild	5	6.1	32	22.1		0	0	37	19.6	
	Moderate	51	62.2	64	44.1		28	73.6	87	46	

		Men 227					Women 227				
		Non depressed (82)		Depressed (145)		P value	Non depressed (38)		Depressed (189)		P value
		No	%	No	%		No	%	No	%	
Age Group	16-25 yrs	13	15.9	36	24.9	0.152	12	31.6	78	41.3	0.362
	26-35 yrs	31	37.8	55	37.9		20	52.6	76	40.2	
	36-45 yrs	30	36.6	35	24.1		6	15.8	35	18.5	
	> 45	8	9.7	19	13.1		0	0	0	0	
	Sever	9	11	26	18		5	13.2	30	15.9	
BMI	BMI < 25	31	37.8	41	28.3	0.287	18	47.4	76	40.2	0.001
	BMI 25-30	26	31.7	58	40		0	0	51	27	
	BMI > 30	25	30.5	46	31.7		20	52.6	62	32.8	

P<0.05 was considered statistically significant

Table 6: statistical significant correlation of depression with variables of couples

	Men 227					Women 227				
	Non Depressed 82		Depressed 145		P value	Non Depressed 38		Depressed 189		P value
	No	%	No	%		No	%	No	%	
Family History+	10	12.2	26	17.9	0.256	0	0	17	9	0.055
Chronic illness	10	12.2	26	17.9	0.256	0	0	15	7.9	0.072
Medication	49	59.7	76	52.4	0.285	38	100	174	92	0.072
Surgical procedures	18	21.9	33	22.7	0.889	11	29	49	26	0.700
Radiological investigation	30	37.5	38	26.2	0.101	32	84.2	148	78.3	0.412
Smoking	36	43.9	72	49.6	0.404	6	15.7	6	3.2	0.002
Alcohol	0	0	5	3.4	0.089	0	0	0	0	-
Life events	42	51.2	89	61.3	0.137	17	44.7	114	60.3	0.076
Supporting	78	95.1	134	92.4	0.430	38	100	179	94.7	0.147
Child adoption	0	0	12	8.2	0.007	0	0	12	6.3	0.110
Sexual Knowledge	72	87.8	107	73.7	0.013	38	100	141	74.6	0.000
Lubricant use	21	25.6	46	31.7	0.332	10	26.3	57	30.1	0.636
Tight clothes	4	4.8	22	15.1	0.019	15	39.4	53	28	0.160
Hot water path	49	59.7	82	56.5	0.639	26	68.4	111	58.7	0.265
Work sit hot	18	21.9	48	33.1	0.076	0	0	21	11.1	0.031
Animal rearing	18	21.9	34	23.4	0.797	5	13.1	15	7.9	0.300
first marriage	80	97.5	136	93.8	0.204	38	100	183	96.8	0.266
second marriage	2	2.4	9	6.2		0	0	6	3.2	

P<0.05 was considered statistically significant

Table 7: correlation of family characteristics with depression

		Men 227					Women 227				
		Non Depressed 82		Depressed 145		P value	Non Depressed 38		Depressed 189		P value
		No	%	No	%		No	%	No	%	
INCOME Groups	> 500000 dinar	30	36.6	73	50.3	0.142	11	28.9	92	49	0.026
	500000 - 1000000 dinar	48	58.6	69	47.6		27	71.1	90	48	
	> 1000000 dinar	3	3.8	3	2.1		0	0	6	3	
Age differences	No Difference	5	6.1	12	8.3	0.000	0	0	17	9	0.000
	1 - 2 years	14	17.1	25	17.3		6	15.8	33	17.5	
	3-4 years	14	17.1	34	23.5		0	0	48	25.4	
	5- 6 years	5	6.1	35	24.1		0	0	40	21.2	

	7-8 years	10	12.2	16	11		5	13.2	21	11.1	
	9-10 years	11	13.4	5	3.4		5	13.2	11	5.8	
	> 10 years	23	28	18	12.4		22	57.8	19	10	
Marriage Durations	< 5 years	25	30.4	55	38		6	15.8	74	39.2	
	5 - 10 years	41	50	58	40	0.353	26	68.4	73	38.6	0.003
	> 10 years	16	19.6	32	22		6	15.8	42	22.2	
Consultation Durations	< 1 year	15	18.3	55	38		6	15.8	64	33.9	
	2-5 years	40	48.7	53	36.5	0.002	16	42.1	77	40.7	0.089
	6-10 years	13	15.9	28	19.3		10	26.3	31	16.4	
	> 10 years	14	17.1	9	6.2		6	15.8	17	9	
Consultation times	first time	11	13.4	22	15.2		5	13.2	28	14.8	
	2-5 times	8	9.8	40	27.6	0.008	1	2.6	47	24.9	0.004
	6-10 times	17	20.7	18	12.4		11	29	24	12.7	
	> 10 times	46	56.1	65	44.8		21	55.2	90	47.6	

P<0.05 was considered statistically significant

Table 8: the statistical significant correlation of the degree of severity of depression with the sociodemographic characteristics of the wives involved in the study

Women		HAM_depression_Degree					P value
		No depression	mild depression	moderate depression	severe depression	very severe depression	
Age	16-25 yrs	12	16	22	24	16	0.001
	26-35 yrs	20	25	8	28	15	
	36-45 yrs	6	12	0	8	15	
Education	Illiterate	5	0	0	5	5	0.000
	primary school	11	23	25	12	18	
	intermediate school	11	8	0	6	13	
	secondary school	6	6	0	4	0	
	Institute	5	8	2	12	10	
	College	0	8	3	21	0	
Occupation	Employed	0	0	3	3	0	0.023
	house wife	38	53	27	57	46	
Religion	Nil	5	11	3	12	9	0.000
	Mild	0	11	5	12	9	
	Moderate	28	31	12	31	13	
	Sever	5	0	10	5	15	
BMI	BMI < 25	18	17	15	24	20	0.000
	BMI 25-30	0	18	15	12	6	
	BMI > 30	20	18	0	24	20	

P<0.05 was considered statistically significant

Table 9: the statistical significant correlation of the degree of severity of depression with the sociodemographic characteristics of the husbands involved in the study

Men		HAM_depression_Degree										P value
		No Depression 82		mild depression 70		moderate depression 36		Severe depression 22		very severe depression 17		
		No	%	No	%	No	%	No	%	No	%	
Age	16-25 yrs	13	15.8	17	24.3	12		0		7		0.000
	26-35 yrs	31	37.8	23	32.9	14		17		1		
	36-45 yrs	30	36.6	21	30	8		1		5		
	>45 yrs	8	9.8	9	12.8	2		4		4		
Education	Illiterate	9	11	5		7		2		2		0.000
	primary school	28	34.1	15		18		7		10		
	intermediate school	17	20.7	18		6		4		5		

Men		HAM depression Degree										P value
		No Depression 82		mild depression 70		moderate depression 36		Severe depression 22		very severe depression 17		
		No	%	No	%	No	%	No	%	No	%	
Age	16-25 yrs	13	15.8	17	24.3	12		0		7		0.000
	26-35 yrs	31	37.8	23	32.9	14		17		1		
	36-45 yrs	30	36.6	21	30	8		1		5		
	>45 yrs	8	9.8	9	12.8	2		4		4		
	secondary school	5	6.1	17	24.3	0		0		0		
	Institute	15	18.3	13		1		2		0		
	College	2	2.4	2		4		7		0		
	Postgraduate	6	7.3	0	0	0		0		0		
Occupation	free work	30	36.6	45		22		16		15		0.001
	Employed	32	39	19		10		6		0		
	Military	14	17.1	6		4		0		2		
	Student	6	7.3	0	0	0		0		0		
Religion	Nil	17	20.7	12		4		2		5		0.000
	Mild	5	6.1	18		6		6		2		
	Moderate	51	62.2	39		14		10		1		
	Sever	9	11	1		12		4		9		
BMI	BMI < 25	30	36.6	26		7		2		7		0.008
	BMI 25-30	27	33	32		14		8		3		
	BMI > 30	25	30.4	12		15		12		7		

P<0.05 was considered statistically significant

Table 10: the statistical significant correlation of degree of severity of depression of wives involved in the study with some social and clinical variables

Women	No Depression	mild depression	moderate depression	severe depression	very severe depression	P value
Family History+	0	2	0	7	8	0.006
Chronic illness	0	4	0	5	6	0.082
Medication	38	48	30	50	46	0.001
Surgical procedures	11	19	5	15	10	0.331
Radiological investigation	32	35	25	47	41	0.055
Smoking	6	0	0	0	6	0.000
Alcohol	0	0	0	0	0	-
Life events	17	27	22	41	24	0.041
Supporting	38	49	30	54	46	0.027
Child adoption	0	0	0	6	6	0.005
Sexual Knowledge	38	36	30	45	30	0.000
Lubricant use	10	10	15	18	14	0.057
Tight clothes	15	10	8	21	14	0.228
Hot water path	26	26	25	34	26	0.025
Work sit hot	0	0	3	8	10	0.001
Animal rearing	5	4	0	0	11	0.000
first marriage	38	50	30	59	44	0.347
second marriage	0	3	0	1	2	

P<0.05 was considered statistically significant

Table 11: the statistical significant correlation of degree of severity of depression of husbands involved in the study with some social and clinical variables

Men	No Depression	mild depression	moderate depression	severe depression	very severe depression	P value
Family History+	11	6	4	11	4	0.000
Chronic illness	10	6	8	7	5	0.024
Medication	50	25	15	20	15	0.000
Surgical procedures	18	10	11	3	9	0.007
Radiological investigation	30	13	15	7	3	0.047
Smoking	36	38	20	6	8	0.180
Alcohol	0	1	2	0	2	0.020
Life events	43	38	25	18	7	0.034
Supporting	79	67	32	20	14	0.163
Child adoption	0	3	3	1	5	0.000
Sexual Knowledge	72	51	28	14	14	0.070
Lubricant use	21	17	12	8	9	0.149
Tight clothes	4	8	5	3	6	0.010
Hot water path	50	34	17	16	14	0.031
Work sit hot	19	20	10	7	10	0.066
Animal rearing	19	11	11	8	3	0.217
first marriage	80	61	36	22	17	0.006
second marriage	2	9	0	0	0	

P<0.05 was considered statistically significant

Table 12: the statistical significant correlation of the degree of severity of depression with the family characteristics of the wives involved in the study

Women		HAM_depression_Degree					Total
		no depression	mild depression	moderate depression	severe depression	very severe depression	
INCOME Groups	> 500000 dinar	11	18	22	27	25	0.000
	500000 - 1000000 dinar	27	34	5	30	21	
	> 1000000 dinar	0	0	3	3	0	
Age Differences G	No Difference	0	1	5	9	2	0.000
	1 - 2 years	6	10	5	5	13	
	3-4 years	0	18	5	8	17	
	5- 6 years	0	9	5	16	10	
	7-8 years	5	6	5	7	3	
	9-10 years	5	9	0	1	1	
	> 10 years	22	0	5	14	0	
Marriage Durations G	< 5 years	6	22	8	26	18	0.017
	5 - 10 years	26	16	17	21	19	
	> 10 years	6	15	5	13	9	
Consultation Durations G	< 1 year	6	8	10	30	16	0.000
	2-5 years	16	29	15	16	17	
	6-10 years	10	4	5	12	10	
	> 10 years	6	12	0	2	3	
Consultation times Groups	first time	5	6	8	11	3	0.000
	2-5 times	1	5	7	16	19	
	6-10 times	11	12	5	6	1	
	> 10 times	21	30	10	27	23	

P<0.05 was considered statistically significant

Table 13: the statistical significant correlation of the degree of severity of depression with the family characteristics of the husbands involved in the study

Men		HAM depression Degree					P value
		no depression	mild depression	moderate depression	severe depression	very severe depression	
INCOME Groups	> 500000 dinar	30	29	19	14	11	0.165
	500000 - 1000000 dinar	48	40	15	8	6	
	> 1000000 dinar	3	1	2	0	0	
Age Differences G	No Difference	5	5	5	2	0	0.000
	1 - 2 years	14	15	3	0	7	
	3-4 years	14	17	10	2	5	
	5- 6 years	4	17	8	6	5	
	7-8 years	10	10	2	4	0	
	9-10 years	11	5	0	0	0	
	> 10 years	24	1	8	8	0	
Marriage Durations G	< 5 years	25	25	12	11	7	0.776
	5 - 10 years	41	30	14	7	7	
	> 10 years	16	15	10	4	3	
Consultation Durations G	< 1 year	15	19	14	15	7	0.000
	2-5 years	39	33	11	3	7	
	6-10 years	14	9	11	4	3	
	> 10 years	14	9	0	0	0	
Consultation times Groups	first time	11	13	5	4	0	0.010
	2-5 times	8	13	10	9	8	
	6-10 times	17	11	5	2	0	
	> 10 times	46	33	16	7	9	

P<0.05 was considered statistically significant

Table 14: the statistical significant correlation of the types of infertility with the family characteristics of the couples involved in the study

		Husband			Wife		
		Primary infertility	Secondary infertility	P value	Primary infertility	Secondary infertility	P value
Age Group	16-25 yrs	43	6	0.000	69	21	0.000
	26-35 yrs	56	30		55	41	
	36-45 yrs	34	31		36	5	
	> 45	27	0		0	0	
Education	Illiterate	25	0	0.000	15	0	0.000
	primary school	47	31		59	30	
	intermediate school	39	11		27	11	
	secondary school	11	11		5	11	
	Institute	26	5		33	4	
	College	6	9		21	11	
	Postgraduate	6	0		0	0	
Occupation	free work	85	43	0.179	0	0	0.108
	Employed	48	19		6	0	
	Military	21	5		0	0	
	Student	6	0		0	0	
	house wife	-	-		154	67	
Religion	Nil	34	6	0.004	34	6	0.004
	Mild	26	11		26	11	
	Moderate	70	45		70	45	

		Husband			Wife		
		Primary infertility	Secondary infertility	P value	Primary infertility	Secondary infertility	P value
Age Group	16-25 yrs	43	6	0.000	69	21	0.000
	26-35 yrs	56	30		55	41	
	36-45 yrs	34	31		36	5	
	> 45	27	0		0	0	
	Sever	30	5		30	5	
BMI	BMI < 25	56	16	0.079	79	15	0.000
	BMI 25-30	52	32		25	26	
	BMI > 30	52	19		56	26	

P<0.05 was considered statistically significant

Table 15: the statistical significant correlation of the types of infertility with social and clinical characteristics of the couples involved in the study

	Husband			Wife		
	Primary infertility	Secondary infertility	P value	Primary infertility	Secondary infertility	P value
Family History+	21	15	0.081	13	4	0.574
Chronic illness	31	5	0.025	10	5	0.737
Medication	95	30	0.044	150	62	0.737
Surgical procedures	35	16	0.741	29	31	0.000
Radiological investigation	47	21	0.768	123	57	0.164
Smoking	86	22	0.004	12	0	0.021
Alcohol	5	0	0.143	0	0	-
Life events	85	46	0.031	85	46	0.031
Supporting	155	57	0.001	155	62	0.146
Child adoption	8	4	0.766	8	4	0.766
Sexual Knowledge	126	53	0.952	126	53	0.952
Lubricant use	52	15	0.128	52	15	0.128
Tight clothes	16	10	0.288	63	5	0.000
Hot water path	96	35	0.280	108	29	0.001
Work sit hot	56	10	0.002	21	0	0.002
Animal rearing	31	21	0.050	15	5	0.643
first marriage	149	67	0.028	154	67	0.108
second marriage	11	0		6	0	

P<0.05 was considered statistically significant

Table 16: the statistical significant correlation of the types of infertility with the family characteristics of the couples involved in the study

		couples		
		Primary infertility	Secondary infertility	P value
INCOME Groups	> 500000 dinar	76	27	0.143
	500000 - 1000000 dinar	78	39	
	> 1000000 dinar	6	0	
Age differences	No Difference	17	0	0.000
	1 - 2 years	28	11	
	3-4 years	37	11	
	5- 6 years	21	19	
	7-8 years	26	0	
	9-10 years	5	11	
	> 10 years	26	15	
Marriage	< 5 years	75	5	0.000

		couples		
		Primary infertility	Secondary infertility	P value
INCOME Groups	> 500000 dinar	76	27	0.143
	500000 - 1000000 dinar	78	39	
	> 1000000 dinar	6	0	
Durations	5 - 10 years	62	37	
	> 10 years	23	25	
Consultation Durations	< 1 year	49	21	0.016
	2-5 years	73	20	
	6-10 years	21	20	
	> 10 years	17	6	
Consultation times	first time	28	5	0.052
	2-5 times	37	11	
	6-10 times	20	15	
	> 10 times	75	36	

P<0.05 was considered statistically significant

Table 17: the statistical significant correlation of the types of infertility with depression and degree of depression among couples involved in the study

			couples		
			Primary infertility	Secondary infertility	P value
Depression	Men	NEGATIVE	62	20	0.203
		POSITIVE	98	47	
	Women	NEGATIVE	32	6	0.042
		POSITIVE	128	61	
Severity Of Depression	Men	Mild Depression	44	26	0.320
		Moderate Depression	26	10	
		Severe Depression	14	8	
		Very Severe Depression	14	3	
	Women	mild depression	29	24	0.010
		moderate depression	20	10	
		severe depression	41	19	
		very severe depression	38	8	

P<0.05 was considered statistically significant

DISCUSSION

Cross-sectional study of infertile couples' depression revealed 63.9% of men and 83.3% of women were depressed. Most of men were of mild to moderate depression (73.1%) and most of women were of severe to very severe depression (56%). Gender difference between prevalence of depression and the severity of depression might be explained by that; in our local traditions, female still blamed for causes of infertility, Gynecologists and Obstetricians are hurry to attribute couple infertility to women factors, wives experienced more emotional

disturbance than the husbands, infertile women suffer social pressure from their relatives and friend, Infertility constitutes a crisis and stigma in affected, women may become isolated and neglected. The reactions may include; frustration, shock, anger, depression, and grief, loss of self-esteem, self-confidence. Infertile women may avoid social interaction with friends who are pregnant and families who have children.

Current study found depression of infertile couple was significantly associated with; education, religion, sexual knowledge and information, child adoption, age difference, and times of consultation.

Couples' severity of depression was significantly correlated with age, education, occupation, religion, and BMI, family history of infertility, taking medication, history of exposed to life events, hot water path, working in hot sitting, child adoption, age difference between husband and wife, duration and times of consultation.

Women depression was significantly associated with BMI, smoking, working in hot sitting, monthly income, and duration of marriage.

Severity of women depression was significantly associated with; smoking, supporting women, sexual knowledge, rearing animals, monthly income, and the marriage duration. This association might be explained by the fact that the longer the infertility crisis continues, the more people in families and neighbors will know about it lead to more social pressure couple will feel; another possible explanation is that longer infertility duration and repeated referrals would gradually change infertility to a chronic problem.

Men depression was significantly associated with occupation, child adoption, wearing tight clothes, duration of consultation, chronic illness, exposed to surgical procedures, exposed to radiological investigations, and frequent marriages.

Women depression and severity of depression were significantly associated with types of infertility.

High prevalence of depression of this study might be explained by; men and women are meant to be parents and that women are socialized to become mother, the true meaning of marriage is only achieved if the couple conceives and bears children; children are held as sources of pride, strength and economic fortune for the family and man’s wealth and strength, the insurance for their parents in old age. Most important aspect of bearing children is an assurance of family continuity.

Furthermore, feeling an emotional distance from one's partner is observed in infertile couples. Infertile couple may experience a lack of sexual satisfaction such as orgasm and arousal. This could result in avoidance of sex altogether or having sex for the sole purpose of reproduction.

Findings of current study was lower than the results of a study conducted in Pakistan (2014) which showed depression was 95% in infertile women[22.] Findings of current study were higher than national and international studies. The study done in Rabat, Morocco (2018) showed that 55% of the women had depression with positive relation to occupation[1]. Oyo State, Nigeria study (2018) depression was 54.5% of infertile women[23]. Iranian study in Tehran (2018) found 30.5 % of infertile women had depression with significant association to infertility duration and failure in previous treatment[24].Survey carried in Katowice, Poland (2018) found (22.52%) of women had light severity of depression[25]. Chinese study inGuangdong Province (2018) showed depression was 47.0% of infertile females[26].Nigerian study in Ogbomoso (2017) found a prevalence of infertile female depression of 52.7%, with no significant association between the age group, level of education, duration of marriage, type of infertility[27].Iranian study in Tehran (2017) found depression was 33.9% infertile females and 31.7% infertile males, which positively associated with duration of infertility[13].Indian study (2017) showed depression in 41% of the infertile females which was correlated with duration of infertility; 21% mild depression, 13% moderate and 7% severe depression. Positive related to occupation and duration of infertility[28].

Pakistani study by Abbasi et al. (2016) found infertile female depression 31.0%[29].

Iraqi study done in Basrah (2015) found the prevalence of depression among infertile women was 68.9%, with significant association to primary infertility, duration of infertility, fear of husband wish to marry, and treatment[30]. San Francisco, USA study (2015) found 39.1% of the women with infertility and 15.3% of the men met the criteria for major depressive disorder during the course of the study[31]. In Ghana (2014) about 62.0% of infertile women were depressed with significant association with age and infertility duration. Degree of severity of depression was significantly associated with education and employment[32]. Iranian study done in Hamadan (2014) infertile women

depression was 31.7%; major depression 8.3%, minor depression 18.3%, and 5% dysthymia[33]. Danish study (2014) reported severe depression in 11.6% of female and 4.3% of male, were significantly correlated with increased infertility distress at the individual and partner level. There was no significant correlation with gender indicating that men and women did not differ in how severe depressive symptoms were associated with infertility distress[34]. Iranian study in Hamadan (2013) depression was 46% among infertile female and 47% among infertile male[35]. Saudi Arabia study in Riyadh by Al Homaidan (2011) found depression 53.8% among infertile females[36].

Current study prevalence of depression among infertile couples was higher than many studies. Drosdzol et al. (2009) females:35.4%[37]. Farzadi et al. (2008) females: 72.54%[38]. Ramezanzadeh et al. (2004) females: 40.8% [39]. Domar et al. (1992) females: 36.7%[40].Ahmadi (2011) depression among infertile males was 42.9% [41].Haririan (2010) depression among infertile females was 58%[42]. Peyvandi (2010) depression among infertile females was 62%[43]. Faraji (2009) depression among infertile females was 57.3%[44]. Farzadi (2008) depression among infertile females was 42.4%[45]. Bahrami (2007) depression among infertile females was 38%and infertile males 50%[46]. Khademi (2005) depression among infertile females was 40.2%[47]. Yassini (2005) depression among both sexes 25%[48]. Behdani (2004) depression among infertile females was 52%[49]. Ramezanzadeh (2004) depression among infertile females was 40.8%[50].Najmi (2001) depression among both sexes 79%[51]. Pasha (2000) depression among infertile females was 28%[52].

The reported prevalence of depressive disorders varies across cultures. Studies, with different population and designs: Cohort study, cross sectional, interviews, case control and systematic review discussed the infertility and depression. Diversity in sample size, selection methods, diagnostic tools and questionnaire used, duration of collecting data also affected the results.

In conclusion, current study found high prevalence of depression among infertile couples; female 83%, male 63% with statistical significance with education, religion, sexual knowledge and information, child adoption, age difference, and times of consultation. Depression among infertile female was severe to very severe depression (56%) while infertile male was mild to

moderate depression (73.1%). Couples' severity of depression was significantly correlated with age, education, occupation, religion, and BMI, family history of infertility, taking medication, history of exposed to life events, hot water path, working in hot sitting, child adoption, age difference between husband and wife, duration and times of consultation. Women depression was significantly associated with BMI, smoking, working in hot sitting, monthly income, duration of marriage and types of infertility. Men depression was significantly associated with occupation, child adoption, wearing tight clothes, duration of consultation, chronic illness, exposed to surgical procedures, exposed to radiological investigations, and frequent marriages.

Limitations of this study should be mentioned in evaluating these results. First, the cross-sectional design of the present study does not allow us to establish causal inferences between study variables. Second, using questionnaires and self-rating, although a useful for assessing the severity of symptoms, are not the best way of identifying the existence of major depression as a disorder. More studies utilizing structured interviews are recommended to assess the prevalence rate of depression among infertile couples.

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