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Original Article

Anxiety and Depression among Infertile Couples Undergoing Invitro Fertilization Treatment in Erbil City

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ABSTRACT

Background and objectives: Infertility affects millions of couples worldwide and is a major public health problem. It is identified as a significant psychosocial crisis and a pathological state. The most prevalent psychological responses in infertile couples are anxiety and depression. This study aimed to assess the status of anxiety and depression symptoms in infertile couples attending IVF centers in Erbil City.

Methods: A quantitative cross-sectional study was conducted in two private IVF centers for infertility diagnosis and treatment at Sardam and Hawler Private Hospitals in Erbil City, Kurdistan Region, from 1st September 2021 to 1st November 2022. A non-probability (convenience) sampling technique was used on 150 infertile couples. Data were collected through the interview method by using data collection tools including a socio-demographic part and the Hospital Anxiety and Depression (HADS).

Results: The results of the present study revealed that 58% of the participants were between the ages of 29-39 years old, and 23.7% of husbands had self- Jobs, whereas wives, (26 %) were housewives, and the highest percentage of husbands and wives (14%) and (15%) graduated from university. The family income of the majority of couples was ≥1000,000IQD per month. The highest proportion 35.7% were married between 6-10 years. Levels of anxiety in wives were (13.3% mild, 16% moderate, and 7.3% severe) compared with (11%, 11%, and 6%) levels of anxiety among husbands. Wives had 17.7% mild,6.3% moderate, and 3.7% severe depression compared with 18%,3%, and 3 % depression levels in husbands. Anxiety levels were higher in wives than in husbands but no significant difference was shown for depression.

Conclusion: The study found that infertile couples receiving IVF treatment had a higher proportion of anxiety and depression symptoms, which could have negative effects on treatment for couples seeking assisted conception. According to the study, couples' psychosocial intervention should be a key component of standard infertility treatments.

Keywords: Infertility couples; Anxiety; Depression; In-vitro fertilization.

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INTRODUCTION

Infertility is a common and big health problem globally. In 2010, it was assessed that there are 48.5 million infertile couples worldwide. defined by (WHO) as a disease of the reproductive system by the failure to achieve a clinical pregnancy after one year or more of consistent unprotected sexual intercourse [1,2], and it has been found to affect about 10–12% of spouses overall in the world [3]. An organism's natural adaptive response to stressful or dangerous events is anxiety. The most prevalent mental disorders are anxiety disorders, which are equally prevalent across all peoples and cultural groups. When anxiety is more intense or doesn't respond as well to the cause, it is considered pathological and needs to be treated by medical care [8].

Anxiety disorders affect more than 260 million individuals worldwide (3.6%) of the global population. Between 2005 and 2015, the prevalence of anxiety disorders - including generalized anxiety disorder, panic disorder, posttraumatic stress disorder, and obsessive-compulsive disorder—increased globally by 14.9%, with the Americas accounting for the majority of this rise. Anxiety disorders are currently the sixth-leading cause of disability. Additionally, more women than men are affected [41].Depression is a widely recognized and serious mental health problem with no current effective treatment, and about one out of every ten individuals globally suffers from depression. Depression may need long-term therapy. They are currently the fourth-leading cause of disability worldwide, and the WHO has determined that in 2020, they will be ranked second after cardiovascular disease. The most severe signs of depression include a depressed mood, decreased activity, loss of interest, and an inability to experience pleasure from joyful events (World Health Organization, 1992). About 5–10% of people experience clinical depression, and today as much as 30% of people experience depressive symptoms at varying intensities throughout their lives [10,42].Infertility can be initiated by a man, a woman, or both of the causes of infertility, 40% can be attributed to men, 40% to women, 10% to both couples and 10% to unknown causes [4]. The inability to conceive a child naturally can lead to feelings of guilt, and shame. These negative feelings may be associated with varying grades of depression, anxiety, distress, and a poor. quality of life, although they dramatically affect the self-esteem and body image of infertile couples, social life, and marriage relationships [5,6]. The use of artificial reproductive technology (ART), including in vitro fertilization (IVF) is one option for people with infertility who wish to become pregnant. Pregnancy loss can cause post-traumatic stress disorder and increased levels of anxiety in women, as well as an increased risk of the spousal relationship dissolving. Studies have also shown that the use of IVF itself has associated physical, psychological, emotional, and financial effects. The prevalence of infertility, as well as the subsequent rates of treatment failure and spontaneous abortion, are widespread problems [7].The first negative emotional reaction to both infertility and assisted reproductive treatment (ART) is frequently either anxiety (a sense of threat, tension, or worry) or depression (a sense of loss, sadness, or lack of control) [10]. The risk of distress, depression, and anxiety is high for infertile couples. Despite the prevalence of infertility, the majority of infertile men and women do not share their stories with people around them (family or friends), thus increasing the susceptibility of their psychological disorders [9]. In our region, most married couples wish to become parents because they believe that

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childbearing is important for the stability of any couple. Some Kurdish people still believe that infertility is exclusively limited to female causes. Kurdish women often come face to face with questions such as, "Are you married? Do you have a child? However, if the cause of infertility is diagnosed as due to male factors, marital conflict can increase and couples may become more separated. Psychologically, women lose their motherhood and sense of gender distinctiveness when they cannot conceive, and men are not measured "to be a man" if they do not have a child [11].

METHODS

A cross-sectional descriptive study was carried out in Erbil city of Kurdistan/Iraq. from 1st September 2021 to 1st November 2022. A convenience (non-probability) sample (of 300 infertile husbands and their wives) of either of those diagnosed with infertility and undergoing treatment for infertility at an IVF center was included in the study; they were taken from two private hospitals; (Sardam and Hawler Private Hospitals). The investigator used a convenient sampling method for recruiting the patients and included all infertile couples attending IVF centers (Primary and Secondary infertile couples), those infertile couples who did not have a history of mental disorders, and the duration of infertility of more than one year. While those couples who were not willing to participate in the study and who suffered from chronic illnesses were excluded. A pilot study was carried out on (12) infertile couples. Statistical analysis has been done by using reliability-testing methods to measure internal consistency and detect the concordance among the items of the scale using the alpha Cronbach. The reliability coefficient was high (r=0.97) for anxiety and (r=0.68) for depression, such items were statistically adequate. Data was collected through interviews using data collection tools including a socio-demographic part, and the Hospital Anxiety and Depression Scale (HADS) by the investigator. The researcher distributed an interview questionnaire among the infertile couples in the centers. During the process of completing the questionnaire, the researcher interviewed illiterate candidates who had difficulty understanding the questionnaires. The interview with each client lasted around 25-30 minutes. The questionnaire was composed of two parts. The first part was on the socio-demographic characteristics of the study sample. This part was composed of 8 questions regarding (age, gender, occupation and education for both genders, and family income per month. duration of marriage, religion, and nationality). The second part was related to assessing infertile couples' anxiety and depression levels, which were measured through the Hospital Anxiety and Depression Scale (HADS) which was used as a scale that was modified by the researcher to organize it according to infertility cases. HADS is a self-administered rating scale composed of 14 items: seven for anxiety and seven for depression. Items are rated on a 4-point severity scale ranging from 0 to 3. Both anxiety and depression can be scored separately, with each subscale scored from 0 to 21. Higher scores on each subscale indicate a higher level of anxiety and depression [12]. Scores of 0-7 are normal, 8-10 are mild,11-14 are moderate,15-21is severe for both anxiety and depression scales [13].The questionnaires have been validated by a panel of eleven experts to investigate the content of the questionnaire for clarity, relevancy, and adequacy. The experts' responses were evaluated based on their agreements or disagreements. The results showed that the majority of the experts agreed with the items of the questionnaire for the study. Some small

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changes have been made to the study instrument according to their recommendation.Before data collection, formal approval was obtained from the Ethical Committee at the College of Nursing, Hawler Medical University. Formal permission was also obtained from IVF centers in Hawler and Sardam private hospitals. Furthermore, informed oral consent was obtained from the candidate's participation in the study after confirmation of confidentiality, and anonymity, and participants were withdrawn from the study's self-determination by the researcher. Participants have withdrawn from the study. The statistical package for social science (SPSS, Version 28) was used for data processing and statistical analysis. The statistical analysis included descriptive statistical analysis such as frequency and percentage to describe the basic features of the data in a study and provide simple summaries about the sample and the measures. Inferential statistical analyses such as the Chi-square test and Fisher-Exact test were applied to make a judgment about inferences from our data to more general conditions. The confidence interval was 95%. The P-value of each test of < 0.05 is considered statistically significant.

RESULT

Table 1: shows the socio demographic characteristics of the study sample. This table also shows that 58% of couples were between the age groups of 29-39 years old and ranging from 18 to 50 years old. Regarding the occupation of the husbands, 23.7% of husbands were self- employed Whereas wives, (26 %) were housewives. 14% of husbands graduated from university and only 2.3% of them were illiterate. The same trend existed in the wife's education as most of them 15% graduated from university and 3% were illiterate. The family income of the majority of study samples was ≥1000,000IQD per month [44], The highest proportion of couples (35.7%) were married between 6-10 years.

Table 1: Basic characteristics of the infertility couples (n=300)

Variables Categories		F (%)
Gender	Male	150(50)
	Female	150 (50)
Age	18 – 28	74 (24.7)
	29 – 39	174 (58)
	≥40	52 (17.3)
Occupation (husbands)	Governmental	58 (19.3)
	Employed Non-Governmental	10 (3.3)
	Employed Unemployed	6 (2)
	Self-Job	71(23.7)
	Student	2 (0.7)
	No Work	3 (1)
Occupation (Wives)	Governmental	34(11.3)
	Employed Non-Governmental	12(4)
	Employed Unemployed	12(4)
	Self-Job	7(2.3)
	Student	7(2.3)
	Housewife	78(26)
Educational level (husbands)	Illiterate	7(2.3)
	Able to read and write	18 (6)
	Primary school	31(10.3)
	High School	24 (8)
	Institution	16(5.3)
	Graduate University	42(14)
	Graduate Post Graduate	12(4)
Total		**300(100)**

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Cont. Table

Variables	Categories	F (%)
Educational level (Wives)	Illiterate	9(3)
	Able to read and write	13(4.3)
	Primary school	35(11.7)
	High School	27 (9)
	Institution Graduate	14(4.7)
	University Graduate	45(15)
	Post Graduate	7(2.3)
The family income per month	< 500.000IQD	55(18.3)
	500.000 – 749.000IQD	82(27.3)
	750.000 – 999.000IQD	28(9.3)
	≥1000.000IQD	135(45)
Years of marriage	1 – 5	100(33.3)
	6 – 10	107(35.7)
	11 – 15	75(25)
	≥16	18(6)
Religion	Islam	300(100)
Nationality	Kurdish	182(60)
	Arab	118(39.3)
Total		**300(100)**

F= Frequency; %= Percentage

Table 2: Illustrates the comparison of anxiety, and depression levels among husbands and wives, 35.3% of the study sample were normal. Wives had (Mild=13.3%, moderate=16%, severe=7.3%) levels of anxiety compared with (11%,11%, 6%) of their husbands; a significant difference was detected (P- value 0.016). No significant 0.200).association was detected between depression levels among husbands and wives,48.3% of total infertile couples were normal. While wives had (mild=17.7%, moderate =6.3%, severe=3.7%) depression compared with (mild=18%, moderate=3%, severe=3%) levels of depression of husbands (P- value 0.200).

Table 2: Comparison of the overall level of anxiety, and depression between husbands and wives

HADS calcification (score)		Male		Female		Total		P-Value
		No.	(%)	No.	(%)	No.	(%)	
Anxiety	Normal (0-7)	66	(22)	40	(13.3)	106	(35.3)	**0.016 (S)**
	Mild (8-10)	33	(11)	40	(13.3)	73	(24.3)	
	Moderate (11-14)	33	(11)	48	(16)	81	(27)	
	Severe (15-21)	18	(6)	22	(7.3)	40	(13.3)	
Depression	Normal (0-7)	78	(26)	67	(22.3)	145	(48.3)	**0.200 (NS)**
	Mild (8-10)	54	(18)	53	(17.7)	107	(35.7)	
	Moderate (11-14)	9	(3)	19	(6.3)	28	(9.3)	
	Severe (15-21)	9	(3)	11	(3.7)	20	(6.7)	
Total		**150**	**(50)**	**150**	**(50)**	**300**	**(100)**	

S= Significant levels; NS= non-significant levels; by Chi-Square test.

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Table 3: Demonstrates the association between Socio-demographic characteristics and level of anxiety. This table showed that no significant association was detected between age (P- value 0.532) and anxiety. A significant association was detected between working status and anxiety for both couples(P-0.003), and the highest level of anxiety was shown among housewife females. And A very highly significant association betweenthe educational level of both spouses and anxiety level was detected (P- value 0.001), Those who graduated from university had a higher level of anxiety. A very highly significant association was detected between family income and anxiety (P- value 0.001). No significant association was found between anxiety and years of marriage (P- value 0.150).

Table 3: Association between Socio-demographic characteristics and level of anxiety

Variables	Categories	Anxiety				P-Value
		Normal No. (%)	Mild No. (%)	Moderate No. (%)	Severe No. (%)	
Age (years)	18 – 28	31 (10.3)	17 (5.7)	17 (5.7)	9 (3)	**0.532 (NS)**
	29 – 39	53 (17.7)	47 (15.7)	50 (16.7)	24 (8)	
	≥ 40	22 (7.3)	9 (3)	14 (4.7)	7 (2.3)	
Occupation	Governmental Employed	37 (12.3)	21 (7)	22 (7.3)	12 (4)	**0.003 (HS)**
	Non-Governmental Employed	13 (4.3)	7 (2.3)	2 (0.7)	0 (0)	
	Unemployed	4 (1.3)	6 (2)	4 (1.3)	4 (1.3)	
	Self-Job	29 (9.7)	18 (6)	20 (6.7)	11 (3.7)	
	Student	4 (1.3)	4 (1.3)	1 (0.3)	0 (0)	
	Housewife	16 (5.3)	17 (5.7)	32 (10.7)	13 (4.3)	
	Non-Workers	3 (1)	0 (0)	0 (0)	0 (0)	
Educational level	Illiterate	0 (0)	1 (0.3)	11 (3.7)	4 (1.3)	**0.001 (VHS)**
	Able to read and write	7 (2.3)	6 (2)	11 (3.7)	7 (2.3)	
	Primary school	17 (5.7)	14 (4.7)	25 (8.3)	10 (3.3)	
	High School	22 (7.3)	15 (5)	11 (3.7)	3 (1)	
	Institution Graduate	13 (4.3)	8 (2.7)	2 (0.7)	7 (2.3)	
	University Graduate	36 (12)	24 (8)	19 (6.3)	8 (2.7)	
	Post Graduate	11 (3.7)	5 (1.7)	2 (0.7)	1 (0.3)	
The family income per month	<500,000IQD	9 (3)	10 (3.3)	26 (8.7)	10 (3.3)	**0.001 (VHS)**
	500,000 – 749,000IQD	28 (9.3)	24 (8)	17 (5.7)	13 (4.3)	
	750,000 – 999,000IQD	7 (2.3)	6 (2)	11 (3.7)	4 (1.3)	
	≥1000,000 IQD	62 (20.7)	33 (11)	27 (9)	13 (4.3)	
Years of marriage	1-5	37 (12.3)	28 (9.3)	24 (8)	11 (3.7)	**0.150 (NS)**
	6-10	45 (15)	26 (8.7)	25 (8.3)	11 (3.7)	
	11-15	19 (6.3)	14 (4.7)	28 (9.3)	14 (4.7)	
	≥16	5 (1.7)	5 (1.7)	4 (1.3)	4 (1.3)	

NS= Non significant; HS= Highly significant; VHS= Very Highly Significant.
by Chi-Square test and Fisher's Exact Test.

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Table 4: Indicates the relationship between the socio demographic characteristics of infertile couples and their level of depression. The result shows that a significant association was detected between depression and the age group 29-39 (P-value 0.004). The level of depression of both spouses with the jobs was significantly associated (P- value 0.028). A very highly significant association between depression and the educational level of both couples was detected (P- value 0.001), and levels of depression were higher among primary school and university graduates. The result showed that (mild = 10%, moderate =2.3 %, severe =1.3%) and (mild=12%, moderate=1.3%, severe=0.3%).

The majority of infertile couples' family income per month was 1000,000 IQD or more and they had (mild =14.7%, moderate = 3.7%, severe =1.3%) levels of depression and levels of depression (mild =8.3%, moderate = 3%, severe =2%) when family income 500,000IQD or less with a lower study sample (P- value 0.015). A significant association was found between depression and the duration of the marriage. The proportion was (mild depression =11.3%, moderate depression = 2.7%, and severe depression =3%) when the duration of marriage was between 11-15 years (P- value 0.042).

Table 4: Association between Socio-demographic characteristics and level of depression

Variables	Categories	Depression				P-Value
		Normal No. (%)	Mild No. (%)	Moderate No. (%)	Severe No. (%)	
Age	18 – 28	47 (15.7)	17 (5.7)	9 (3)	1 (0.3)	0.004 (HS)
	29 – 39	75 (25)	70 (23.3)	17 (5.7)	12 (4)	
	≥ 40	23 (7.7)	20 (6.7)	2 (0.7)	7 (2.3)	
Occupation	Governmental Employed	44 (14.7)	37 (12.3)	7 (2.3)	4 (1.3)	0.028 (S)
	Non-Governmental	18 (6)	4 (1.3)	0 (0)	0 (0)	
	Employed					
	Unemployed	7 (2.3)	7 (2.3)	3 (1)	1 (0.3)	
	Self-Job	36 (12)	31 (10.3)	4 (1.3)	7 (2.3)	
	Student	5 (1.7)	3 (1)	1 (0.3)	0 (0)	
	Housewife	32 (10.7)	25 (8.3)	13 (4.3)	8 (2.7)	
	Non-Workers	3 (1)	0 (0)	0 (0)	0 (0)	
Educational level	Illiterate	0 (0)	5 (1.7)	5 (1.7)	6 (2)	0.001 (VHS)
	Able to read and write	12 (4)	9 (3)	4 (1.3)	6 (2)	
	Primary school	25 (8.3)	30 (10)	7 (2.3)	4 (1.3)	
	High School	33 (11)	11 (3.7)	6 (2)	1 (0.3)	
	Institution Graduate	14 (4.7)	12 (4)	2 (0.7)	2 (0.7)	
	University Graduate	46 (15.3)	36 (12)	4 (1.3)	1 (0.3)	
	Post Graduate	15 (5)	4 (1.3)	0 (0)	0 (0)	
The family income per month	< 500,000	15 (5)	25 (8.3)	9 (3)	6 (2)	0.015 (S)
	500,000 – 749,000	43 (14.3)	25 (8.3)	7 (2.3)	7 (2.3)	
	750,000 – 999,000	11 (3.7)	13 (4.3)	1 (0.3)	3 (1)	
	≥1000,000	76 (25.3)	44 (14.7)	11 (3.7)	4 (1.3)	
Years of marriage	1-5	54 (18)	33 (11)	10 (3.3)	3 (1)	0.042 (S)
	6-10	61 (20.3)	32 (10.7)	8 (2.7)	6 (2)	
	11-15	24 (8)	34 (11.3)	8 (2.7)	9 (3)	
	≥16	6 (2)	8 (2.7)	2 (0.7)	2 (0.7)	

S= Significant level; HS= Highly significant. ⍰ by Chi-Square test.⍰ by Fisher Exact Test.

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DISCUSSION

Compression level of anxiety and depression in Husbands and WivesThe present study found that husbands and their wives had higher anxiety levels; the levels were significantly higher among infertile women compared with men. Anxiety among infertile women: the percentage of those with mild, moderate, and severe anxiety was (13.3%, 16%,7.3%) compared to their husbands, and the percentage of those with mild, moderate, and severe anxiety was (11%, 11%, 6%). Regarding the depression levels among couples, our result shows that depression was higher among women than men but not statistically significant. Among infertile women, the percentages of those with mild, moderate, and severe depression were (17.7%,6.3%, and 3.7%) compared with (18%= mild,3% =moderate,3%= severe) levels of depression among men. This study was conducted in China on infertile couples under IVF treatment. Regarding anxiety in women it was demonstrated that women significantly had a higher level of anxiety compared to men (p-value < 0.05), and also about the level of depression, women had more depression than men but it was not statistically significant;it was similar to our study results [39]. Another supportive study shows that the prevalence rates of anxiety and depression were (49.6%) and (33%), respectively, and women were 2.26 times more likely to have anxiety symptoms than men, but it disagreed with our results regarding depression because it revealed that depression was not related to sex [16]. Also, another study conducted in India supports our finding regarding anxiety and found that among 270 consecutive couples', the prevalence of anxiety was observed in 49.6% of females and 45.6% of males. The difference was statistical-lysignificant. Also, the prevalence of depression was significantly higher among females as compared to males in contrast with our result [38]. Another study conducted on infertile Italian couples refused our result because the level of anxiety and depression among women was significantly higher than in men (P- value < 0.0001) [40]. Faramarzi et al. showed that women reported statistically significantly higher levels of anxiety and depression when compared with men, in contrast to the present study [43]. Socio-demographic characteristics of both couples and their association with anxiety and depression levels Age and gender The result of this study revealed that the highest percentage (58%) of the present study samples were between the ages of 29-39 years old, and the lower proportion of the study was between the ages of 40 and more (17.3%). A similar study in Bangladesh on the psychological state of infertile couples revealed that (75.9%) of the study samples were between the ages of 29-38 years old and only (3.9%) of couples aged ≤ 39 years old [15]. It means that people in the age group 29- 39, who are of reproductive age had a higher desire and ability to be pregnant and to have a child, especially women. Regarding gender, 150 husbands and their wives participated in our study at the same time to assess and compare the rates of anxiety and depression among couples Regarding the association of study samples' age with anxiety and depression levels (Table 3), the current study illustrated no significant association between anxiety and age. A similar study was conducted in Iran and found no significant association between anxiety and age [16]. Our result refused by this study conducted on infertile women in China demonstrated that the psychopathological symptoms of the infertile women were aggravated by advanced age [17].Regarding the relationship between age and depression levels,

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our result in (Table 4) demonstrated a highly significant association between depression and age, the age group 29-39 years had a higher level of depression because they were closer to menopause in this age group or they also may have been receiving treatment for infertility for a long time, especially in cases of long-term marriage. This supported study in Japan shows a significant association between depression and age; higher depression was detected among patients in their twenties and those in the 35-39, 40, and over age groups. As age increased, participants exhibited a greater tendency toward depression [18]. Another study in Nigeria reported that the age of the respondents is associated with increased psychological distress [19]. Equally, Drosdzol et al reported that there is an increased risk of psychiatric disorders (anxiety and depression) in infertile women older than 30 years [20]. On the contrary, Gameiro et al reported that older age was a protective factor against developing mental health problems in individuals undergoing fertility treatment [21].

Occupation Regarding the occupation of the husband, the majority (23.7%) of husbands were self-employed and only 1% were non-workers. Whereas the wives (26%) were housewives, and, only 2.3% had self-employed. Similar results were shown in a study conducted in Turkey on infertile couples, in which the researcher revealed that all of the men worked. Meanwhile, the highest percent of the wives were housewives [22]. In contrast, another cross-sectional study conducted on infertile Turkish couples showed that a higher percentage of husbands and wives were self-employed [23].Regarding the relationship between occupation with anxiety and depression levels (Table 3,4). The finding in this study indicated that anxiety was significantly associated with occupation among study samples. High levels of anxiety and depression were detected among the housewives' group. An individual's working status affects both their social and economic lives Women with economic power have much more self-confidence and a sense of control over their lives. However, this study in Turkey carried out on infertile couples discovered that depression ratios in infertile housewives were higher.It was similar to our result, but anxiety did not have relationship with working status. It was demonstrated that. There were no statistically significant differences between occupation and anxiety and depression levels among infertile men, this disagreed with our study results [24]. However, this study in Turkey on infertile this women also shows that the majority of the participants were unemployed, and found a positive relationship between the employment status of participants receiving infertility treatment with anxiety and depression. Participants who did not have wage-earning employment had higher anxiety and depression than those who had jobs. It was similar to our results [25].

Educational level The highest percentage of the study participants in this current study graduated from university and only a few of them were illiterate. A descriptive-analytical study conducted in Iran revealed that the majority of the participants had a high level of education (university) (63.92%) which was similar to our result [26]. Although this study carried out in Vietnam had the same results as the highest study sample graduated from university [27].Regarding the association between the educational level of couples and the level of anxiety and depression (Table 3,4), a higher percentage of the study sample graduated from university, so the level of anxiety and depression was higher among those groups. Maybe it is related to the

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fact that they had graduated from university but had not been employed or had job opportunities, in public institutions or the private sector. Our result was rejected by this study in Iran. The results demonstrated that the level of educational background had an input on the psychological strains of patients. In general, illiterate couples compared with educated couples, were shown to have the highest rates of both depression and anxiety. Also, severe depression and anxiety were observed in 27% and 22% of illiterate women, respectively. These levels were reduced to 4.5% and 0% in women with university educations, respectively [28]. Although numerous studies have shown that education levels have a protective impact on depression and anxiety, they revealed that the level of anxiety and depression tends to decrease when the level of education increases [29,30,31,32].

The family income per month In the present study, the highest percentage of infertile couples (45%) had one million IQD or more per month, which means that they had high economic status. The results were similar to the study in Iran, (48.3%) of the couples had a high level of income (20.000.000IRRs or more) [34]. In this study in Turkey, the finding in disagreement with the present study was that (33.3%) of the study samples had lower categories (equal to or less than 1000TL) [33]. Regarding family income per month (Table 3,4), the current study demonstrated that there was a highly significant association between family income and anxiety level and a significant association between family income and depression. The highest percentage 45% of the study sample had a higher level of income. Findings of this study in Pakistan reported by Razzaque et al. similar to the present study stated that monthly income was associated with anxiety and depression and most of the participants had a high level of income [35]. Another supportive study found that infertile females and males' monthly income was significantly associated with a psychiatric disorder [37]. The result of this study in Egypt opposed to our result reveals that there is a highly significant correlation was found between family income and depression, but depression was more observed in low family incomes compared with high ones [45]. **Duration of marriage**, n this study, we demonstrated that the highest percentage of couples (35.7%) were married between (6-10) years. It is similar to a cross-sectional study done by Singh et al in India, (43.3%) of the couples were married between (6-10) years [38]. In contrast to our study, in this study in Nigeria, the highest percentage of couples' marriages is equal to or less than 5 years [19].Regarding the relationship between anxiety and depression with the duration of marriage (Table 3,4), in the present study, a significant association was not found between anxiety and the duration of married couples, but according to the relationship between depression and the duration of marriage, we found a significant association. The finding was different from the result of this study conducted by Chen et al. established that there was no significant association between anxiety, depression, and duration of marriage [14]. Another study also shows that there was no statistically significant correlation between marriage span, and depression as well between marriage span and anxiety [36].

Religion and nationality A recent study found that all candidates who participated in the study were Muslims. Regarding nationality, the highest proportion of them were Kurdish people because the study was carried out in a city in the Kurdistan region of Iraq. Only (39.3%) of the cases were Arabic people.

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CONCLUSION

The study found that infertile couples receiving IVF therapy had greater rates of anxiety and depression, which could increase the treatment burden for couples seeking assisted conception. According to the study, couples' psychosocial intervention should be a key component of standard infertility treatments and play a significant part in them.

CONFLICT OF INTEREST

There are no conflicts of interest or sources of financial support for any of the authors.

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