

## **AIM OF THE WORK**

The aim of the present work was:

1. To study the prevalence of anxiety and depression disorders among children with chronic renal failure undergoing dialysis at Alexandria University Children's hospital and student's insurance hospital (ElTalaba).
2. To study the possible associated factors of anxiety and depression in those children.

## SUBJECTS AND METHODS

This cross sectional study was conducted on 55 children that have been recruited from Alexandria University Children Hospital (AUCH) and health insurance institution haemodialysis unit.

**The study population:** Included 55 children (index subjects) showing the following criteria:

### **Inclusion criteria:**

- 1- All patients with chronic renal failure undergoing dialysis.
- 2- Age: more than six years and less than 18 years.

### **Exclusion criteria:**

1. Acute renal failure.
2. Associated chronic medical or surgical disorders other than those causing or complicating their renal disease.

### **All children undergo the following:**

#### **Informed consent from the parents or legal guardian was taken.**

#### **1- History taking with special emphasis on:**

- 1) Personnel data: name, age, gender, address and school attendance.
- 2) History of other chronic medical or surgical problems.
- 3) Family history:
  - Marital status.
  - Caregiver level of education and employment.
  - Social standard.
  - Similar condition in the family.
- 4) History of the illness:
  - Type of dialysis.
  - Duration since start of dialysis sessions.
  - Number of dialysis session / week.

#### **2- Psychiatric assessment:**

- a) Taking a comprehensive history from parents
  - Family structure.
  - Parent's marital status.
  - Psychiatric troubles.
- b) Observing the attitudes and behavior of the parents toward their children
- c) Performing a mental status examination of the child e.g.:
  - Physical appearance
  - Orientation
  - Speech and language
  - Reading and writing
  - Mood and Affect
  - Memory
  - Intelligence
- (d) Presence of close friend to confide in.

**3- Full physical examination:** General and local physical examination with special emphasis on the presence of disfigurement due to multiple access insertion and poor body image due to bone deformities and failure to thrive.

**4- Certain laboratory investigations:**

- 1) Hemoglobin (g/dl).
- 2) BUN (mg/dl) (predialysis and post dialysis).
- 3) Kt/v (Adequacy of dialysis): is a number used to quantify hemodialysis and peritoneal dialysis treatment adequacy.

Where K=dialyser clearance-volume of fluid completely cleared of urea in a single treatment in ml/min, t= time, V=volume of water in a patient body.

**5- Psychometric assessment:**

**(1) To diagnose any psychiatric disorders (anxiety and depression) according to DSM-5 diagnostic criteria for generalized anxiety disorder <sup>(65)</sup> and Major Depressive Disorders (MDD) <sup>(66)</sup>.**

**(2) To assess degree of anxiety, Arabic version of Children's Manifest Anxiety Scale by Elpeblawy (CMAS) was used.** (The applied form will be shown in the appendix 1) The CMAS is a self-report instrument measuring anxiety in children (6–19) years of age, and consists of (42) items and (11) items as Lie scale. Each of which requires a yes or no answer. Lie Scale score above 3 is indicative of an inaccurate self-report and the child is excluded, it detects youth who are "faking good" (e.g., "I tell the truth every single time"). The cutoff points for anxiety in children as follows:

- Low anxiety: less than 18
- Moderate : 19-28
- High : more than 29

The scale was done by Castaneda, McCandless and Palermo in 1956 and translated to the Arabic version by Dr. Elpeblawy in 1986.<sup>(76)</sup> It generates a Total Anxiety (T score) as well as scaled scores on three anxiety subscales: (Physiological Anxiety): items about somatic manifestations of anxiety such as sleep difficulties, nausea and fatigue.

(Worry/Oversensitivity): items measuring obsessive concerns about a variety of things, most of which are typically vague and ill-defined, as well as fears about being hurt or emotionally isolated.

(Social Concerns/Concentration): items measuring distracting thoughts and fears that have a social or interpersonal nature.

**(3) To assess degree of depression, Arabic version of Kovac Children's Depression Inventory by Ghareeb Abdel fatah ghareeb (CDI), was used : (Appendix 2):**

It is a self-report (27-item) scale, the child is asked to select the response that best describes his or her feelings in the past 2 weeks. This test was done by Kovac in 1977 after several modifications on Beck Depression Inventory scale of adult depression and published in 1982. The Arabic version of the test was done by Ghareeb in 1987 <sup>(77)</sup>.

Designed for school aged children and adolescents. Although originally tested on (8–13) year-olds, the current version of the CDI has been validated with a large population of 7–18 years old.

## Subjects and Methods

Total score ranges from (0 to 54). The degree of depression is determined according the following cutoff points:

Age in yrs and ms	Female	Score	Grade	Male	Score	Grade
7,6<10,6		0-14	Non		0-14	Non
		15-22	Mild		15-22	Mild
		23-29	Moderate		23-29	moderate
		> 29	Severe		>29	severe
10,6<13,5		0-16	Non		0-14	Non
		17-23	Mild		15-21	Mild
		24-30	Moderate		22-27	moderate
		>30	Severe		>27	severe
13.6-16,5		0-18	Non		0-14	Non
		19-24	Mild		15-21	Mild
		25-30	Moderate		22-28	moderate
		>30	Severe		> 28	severe

The CDI has sensitivity of (80%) and specificity of (84%) in classifying participants as depressed versus not depressed. It generates a total T score as well as T scores on five subscales: Negative Mood, Interpersonal Problems, Ineffectiveness, Anhedonia, and Negative Self-Esteem. <sup>(78)</sup>

**(4) Intellectual assessment using: Stanford-Binet intelligence test, Arabic form.** <sup>(79)</sup>

It is a cognitive ability and intelligence test that is used to diagnose developmental or intellectual deficiencies in young children. The test measures five weighted factors and consists of both verbal and nonverbal subtests.

**(5) Modified score of socioeconomic status of families (modified after Fahmy and El sherbiny 1983).** <sup>(80)</sup>

## **Statistical analysis of the data <sup>(81)</sup>**

Data were fed to the analyzed computer and using IBM SPSS software package version 20.0.<sup>(82)</sup> Qualitative data were described using number and percent. Quantitative data were described using Range (minimum and maximum), mean, standard deviation and median. Comparison between different groups regarding categorical variables was tested using Chi-square test. When more than 20% of the cells have expected count less than 5, correction for chi-square was conducted using Fisher's Exact test or Monte Carlo correction. The distributions of quantitative variables were tested for normality using Kolmogorov-Smirnov test, Shapiro-Wilk test and D'Agstino test, also Histogram and QQ plot were used for vision test. If it reveals normal data distribution, parametric tests was applied. If the data were abnormally distributed, non-parametric tests were used. For normally distributed data, comparison between two independent population were done using independent t-test while more than two population were analyzed F-test (ANOVA) to be used. For abnormally distributed data, comparison between two independent population were done using Mann Whitney test while Kruskal Wallis test was used to compare between different groups and pair wise comparison was assessed using Mann-Whitney test. Correlations between two quantitative variables were assessed using Spearman coefficient. Significance of the obtained results was judged at the 5% level.

## RESULTS

### Descriptive data of the studied group:

#### Assessment of demographic data among children with CRF in the studied sample

The current study was conducted on 55 children recruited from Alexandria University Children Hospital (AUCH) and health insurance institution haemodialysis unit.

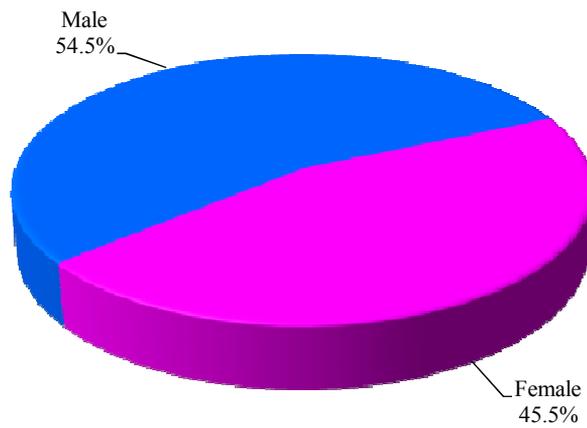
As regard the gender of the studied patients; there were 30 male children (54.5%) and 25 females (45.5%). (Table 6, Figure 1).

The range of the age among the studied group was (7-17) years. The mean age was ( $13.44 \pm 2.62$  SD) years. Divided into 2 groups; group of children aged (7-12) yrs were about 21 patients (38.2%) and group of adolescents aged (13 – 18) yrs were about 34 patients (61.8%).(Table 6,Figure 2).

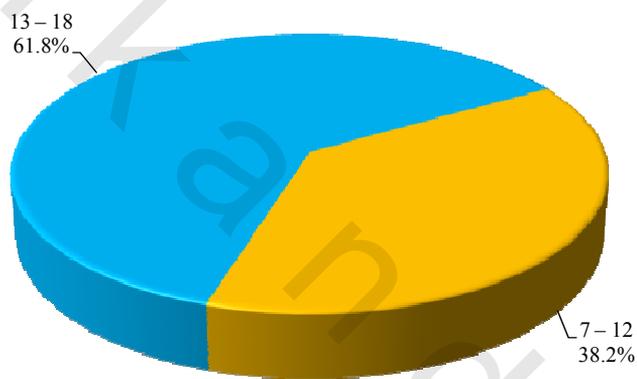
The studied children were classified as regard the residency, there were 23 patients (41.8%) coming from urban areas, 32 patients (58.2%) coming from rural areas.(Table 6,Figure 3).

**Table (6): Assessment of demographic data among children with CRF in the studied sample.**

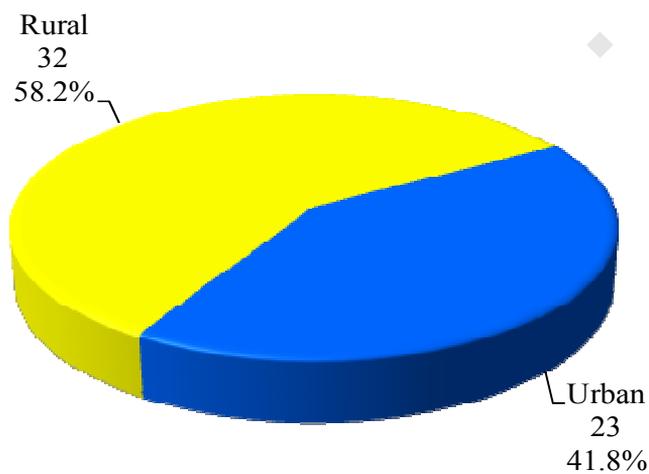
	No.	%
<b>Gender</b>		
Male	30	54.5
Female	25	45.5
<b>Age (years)</b>		
7 – 12	21	38.2
13 – 18	34	61.8
Min. – Max.	7.0 – 17.0	
Mean $\pm$ SD	$13.44 \pm 2.62$	
Median	13.0	
<b>Residency</b>		
Urban	23	41.8
Rural	32	58.2



**Figure (1):** Assessment of gender among the studied sample.



**Figure (2):** Assessment of age among the studied sample.



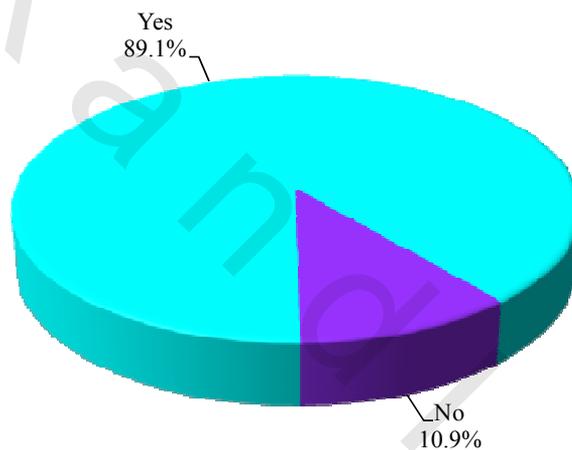
**Figure (3):** Assessment of residency among the studied sample

**Table (7): Assessment of school attendance and family structure among the studied sample**

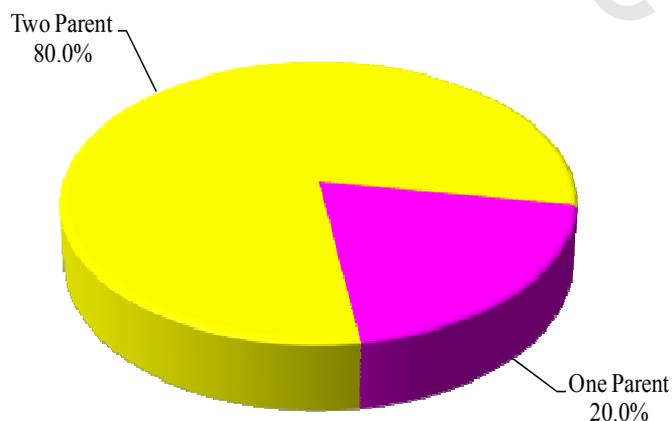
	No.	%
<b>Attending school</b>		
No	6	10.9
Yes	49	89.1
<b>Family structure</b>		
Single Parent home	11	20.0
Two Parents home	44	80.0

As regard school attendance, there were 49 patients (89.1 %) attended school regularly, 6 patients (10.9%) didn't attend school. (Table 7, Figure 4).

Regarding the family structure among families of the studied children, there were (44) patients with tow parents home (80%), 11 patients with single parent home (20 %). (Table 7, Figure 5).



**Figure (4): Assessment of school attendance among the studied sample**



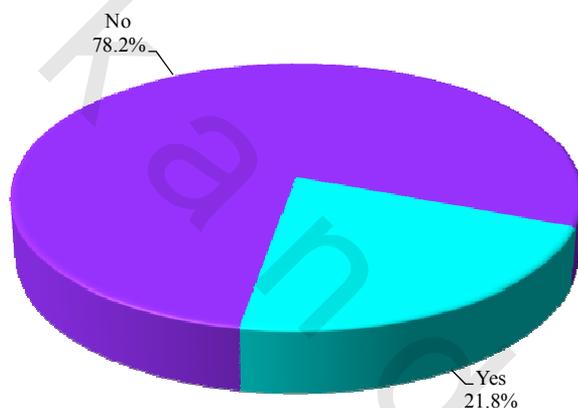
**Figure (5): Assessment of the family structure among the studied sample.**

**Table (8):** Assessment of the presence of family history of renal disease and presence of close friend to confide in among the studied sample.

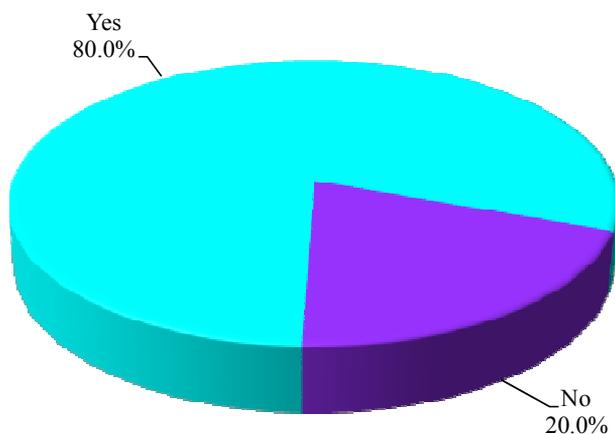
	No.	%
<b>Family History of Renal Disease</b>		
No	43	78.2
Yes	12	21.8
<b>Friend to Confide in</b>		
No	11	20.0
Yes	44	80.0

There were 12 patients having positive family history of renal disease (21.8%) while (78.2%) didn't have. (Table 8, Figure 6).

Forty four patients among children undergoing dialysis, had a friend to confide in, and 11 patients (20%) didn't have. (Table 8, Figure 7).



**Figure (6):** Assessment of the presence of family history of renal disease among the studied sample.



**Figure (7):** Assessment of the presence of close friend to confide in among the studied sample.

**Table (9): Assessment of different parameters among the studied sample**

	No.	%
<b>Hb (g/dL)</b>		
Min. – Max.	4.80 – 12.70	
Mean ± SD.	9.09 ± 1.68	
Median	9.0	
<b>KT/V (Adequacy of dialysis) (≥1.2)</b>		
Not adequate	6	10.9
Adequate	49	89.1
<b>Duration of dialysis</b>		
Min. – Max.	4 months – 16 years	
Mean ± SD.	3.60 ± 3.68	
Median	2.60	
<b>Number of dialysis/wk</b>		
Min. – Max.	2.0 – 4.0	
Mean ± SD.	3.09 ± 0.35	
Median	3.0	
<b>Socioeconomic status</b>		
Low	24	43.6
Moderate	24	43.6
High	7	12.7

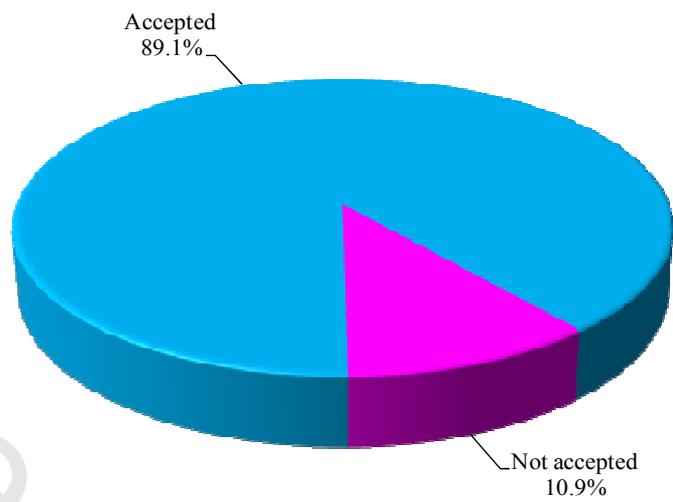
A number of clinical data studied among dialysed children including the Range of hemoglobin which was (4.80 – 12.70) .The mean hemoglobin level was (9.09 ± 1.68). (Table 9).

As regard the adequacy of dialysis (KtV), there were 49(89.1%) patients with adequate dialysis (KtV ≥1.2). (Table 9, figure 8)

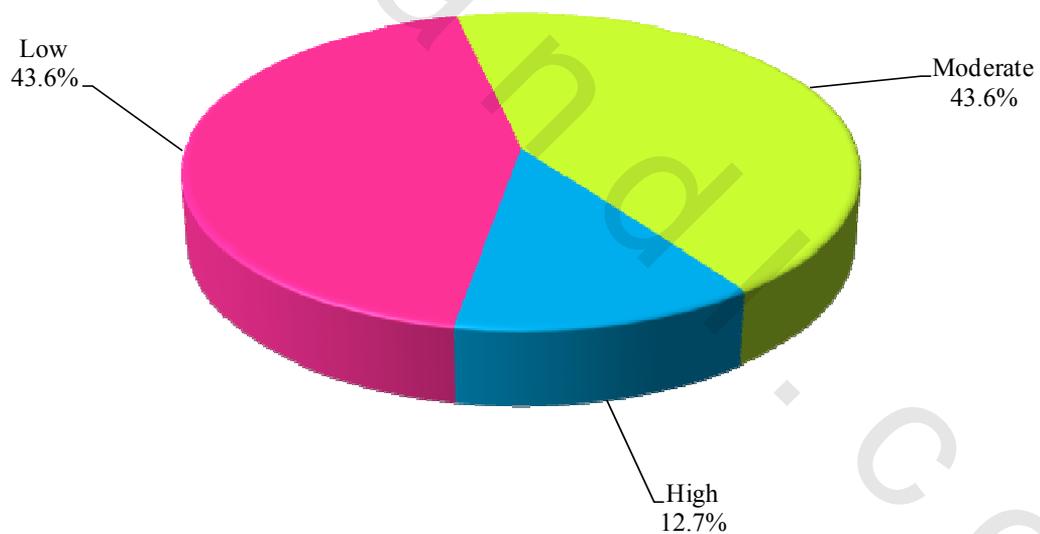
The duration since the start of dialysis ranged widely from (4 month up to 16 years) of age, with the mean duration since the start of dialysis was 3 years. (Table 9)

The Number of dialysis sessions /wk among the studied group was ranged from 2-4 times/week. The mean number of dialysis session was (3.09 ± 0.35). (Table 9)

Children undergoing haemodialysis were classified according to their socioeconomic status into: 24 patients (43.6%) with low SES, 24 patients (43, 6%) with moderate SES, 7 patients (12.7%) with high SES. (Table 9, Figure 9)



**Figure (8):** Assessment of adequacy of dialysis ( $KT/V \geq 1.2$ ) among the studied sample



**Figure (9):** Assessment of socioeconomic status among the studied sample

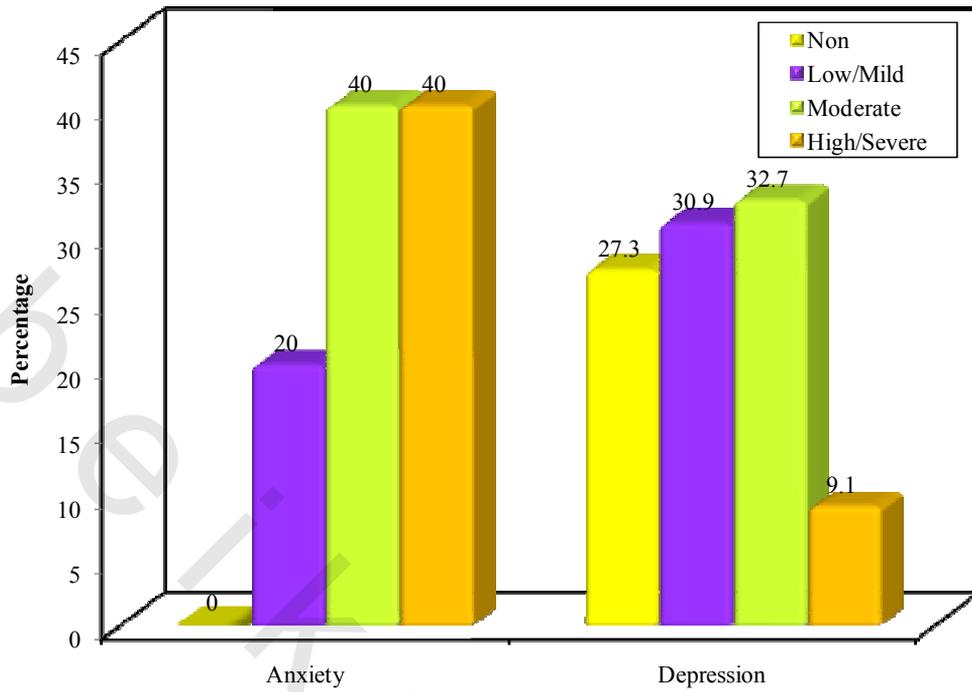
**The Prevalence of anxiety and depression among the study group**

Assessment of anxiety in the current study was done using the DSM 5 diagnostic criteria for diagnosing generalized anxiety disorder and the arabic version of Children’s Manifest Anxiety Scale (CMAS) by Elpeblawy. Among the studied children; all children showed manifestations of anxiety, there were (40%) of children diagnosed as having high anxiety, (40%) had moderate anxiety and (20%) had low anxiety. (Table 10, Figure 10, 11)

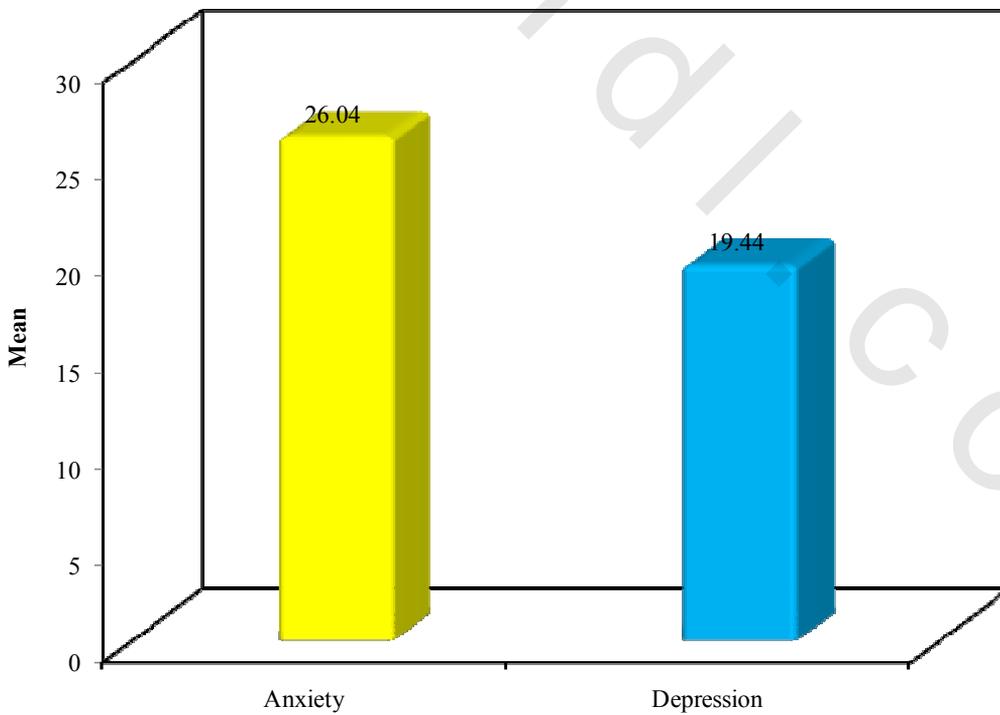
Using the DSM 5 diagnostic criteria for diagnosing major depressive disorders and the arabic version of Kovacs Children’s Depression Inventory (CDI) by ghareeb abdel fatah Ghareeb, there were 17(30, 9%) patients had mild depression among the studied children, 18 patients (32.7%) with moderate depression, 5 patients (9.1%) With severe depression, however, 15 patients (27%) in the studied group had no depression. (Table 10, Figure 10, 11)

**Table (10): Assessment of anxiety and depression using (CMAS) and (CDI) among the studied sample**

	No.	%
<b>Anxiety (CMAS)</b>		
low	11	20.0
Moderate	22	40.0
High	22	40.0
Min. – Max.	9.0 – 38.0	
Mean ± SD.	26.04 ± 7.18	
Median	26.0	
<b>Depression (CDI)</b>		
Non	15	27.3
Mild	17	30.9
Moderate	18	32.7
Severe	5	9.1
Min. – Max.	8.0 – 31.0	
Mean ± SD.	19.44 ± 5.77	
Median	21.0	



**Figure (10):** Assessment of anxiety and depression using (CMAS) and (CDI) among the studied sample



**Figure (11):** Assessment of anxiety and depression using (CMAS) and (CDI) among the studied sample

### **Possible risk factors of anxiety in pediatric patients with CKD undergoing haemodialysis in our study.**

Of the 55 children of the current study, there were 11 patients with mild anxiety and 22 patients with moderate anxiety and 22 patients with severe anxiety on the CMAS scale.

In the present study, regarding the gender, it was found that 53.3% of male patients had moderate anxiety in comparison to 24% of female patients, but it was not statistically significant. (Table 11, Figure 12).

As regard the age, it was found that 44.1% of adolescents had severe anxiety compared to 3.3% of children aged (7-12 yrs). There was no significant relationship between the age and the prevalence of anxiety among patients of CRF (p value =0.707). Also no correlation between age and anxiety was detected. (Table 11, Figure 13).

As regard children group (7-12 yrs), it was found that 58.3% of males had moderate anxiety in comparison to 22.2% of female patients and it was not statistically significant. (Table 11, Figure 14).

Among adolescents (13-18 yrs), it was found that 50% of males had moderate anxiety compared to 25% of females but with no statistical significance too. (Table 11, Figure 14).

As regard the residency, 40.6% of those coming from rural areas had severe anxiety compared to 39.1% of those coming from urban areas, Also 40.6% of patients coming from rural areas had moderate anxiety compared to 39.1% of those coming from urban areas and it was not statistically significant. (Table 11, Figure 15).

Table (11): Distribution of the studied sample according to anxiety anxiety and demographic data

	Anxiety						Test of Sig.	P
	low		Moderate		High			
	No.	%	No.	%	No.	%		
<b>Gender</b>	<b>n = 5</b>		<b>n = 9</b>		<b>n = 7</b>		$\chi^2= 2.729$	MC p = 0.322
<b>Children (7 – 12yrs)</b>								
Male	2	16.7	7	58.3	3	25.0		
Female	3	33.3	2	22.2	4	44.4		
<b>Adolescents (13 – 18 yrs)</b>	<b>n = 6</b>		<b>n = 13</b>		<b>n = 15</b>		$\chi^2= 2.493$	MC p = 0.290
Male	2	11.1	9	50.0	7	38.9		
Female	4	25.0	4	25.0	8	50.0		
Total male	4	13.3	16	53.3	10	33.3	$\chi^2=5.133$	0.073
Total female	7	28.0	6	24.0	12	48.0		
<b>Age (years)</b>	<b>n = 11</b>		<b>n = 22</b>		<b>n = 22</b>		$\chi^2= 0.693$	0.707
7 – 12	5	23.8	9	42.9	7	33.3		
13 – 18	6	17.6	13	38.2	15	44.1		
<b>r<sub>s</sub>(p)</b>	0.222 (0.103)							
<b>Residency</b>	<b>n = 11</b>		<b>n = 22</b>		<b>n = 22</b>		$\chi^2= 0.075$	0.963
Urban	5	21.7	9	39.1	9	39.1		
Rural	6	18.8	13	40.6	13	40.6		

$\chi^2$ : value for Chi square test

MC: Monte Carlo

r<sub>s</sub>: Spearman coefficient

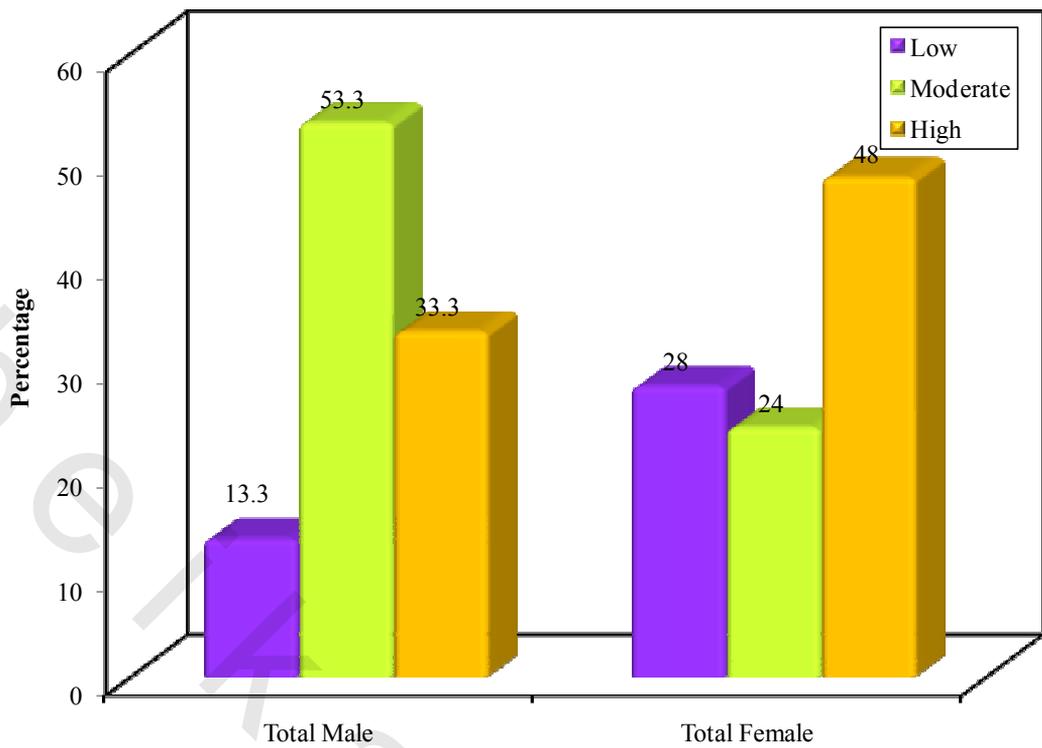


Figure (12): Distribution of the studied sample according to anxiety and gender

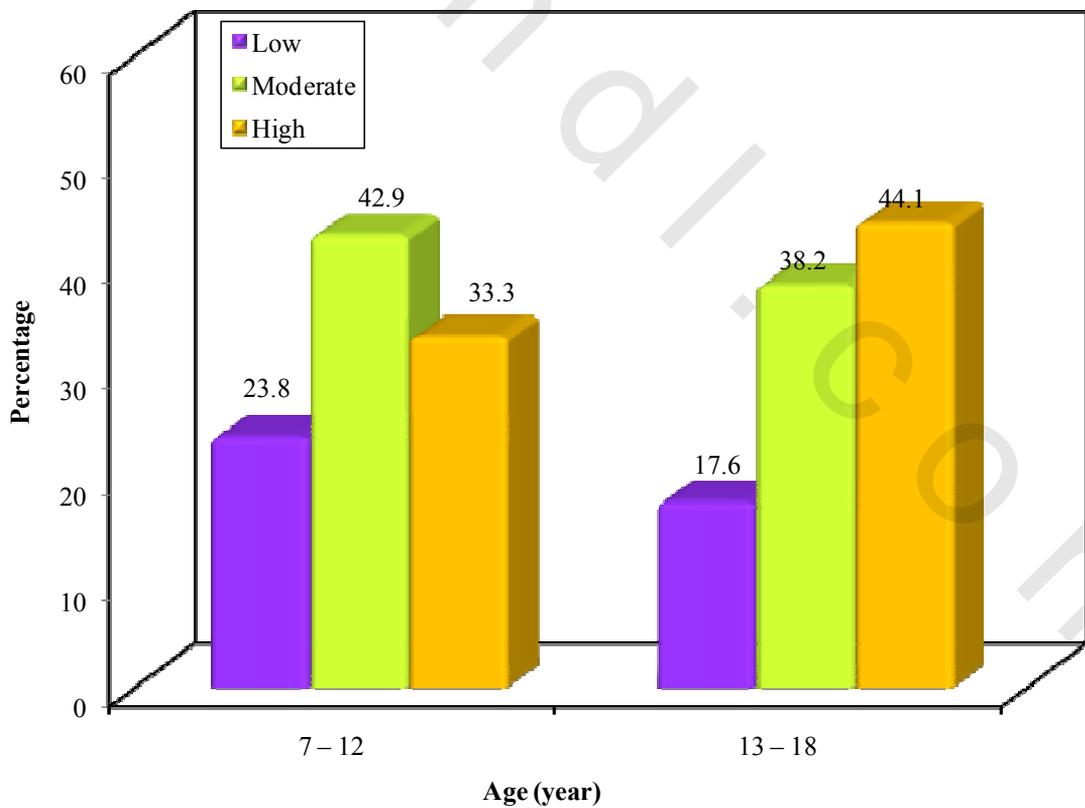
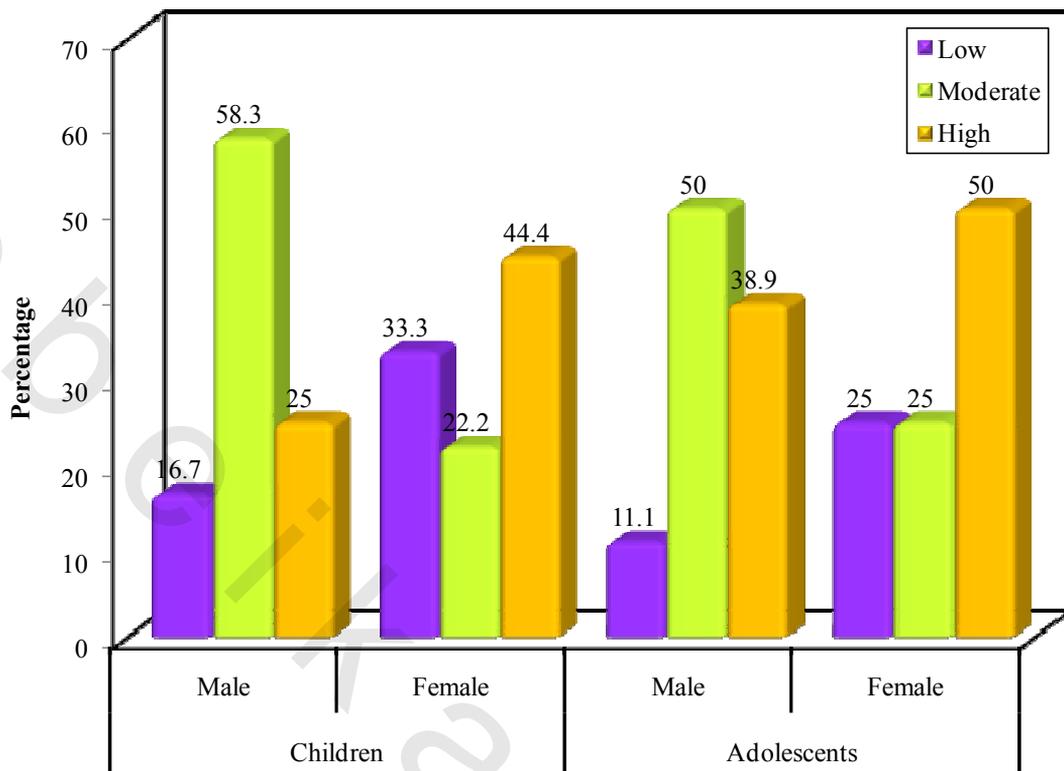
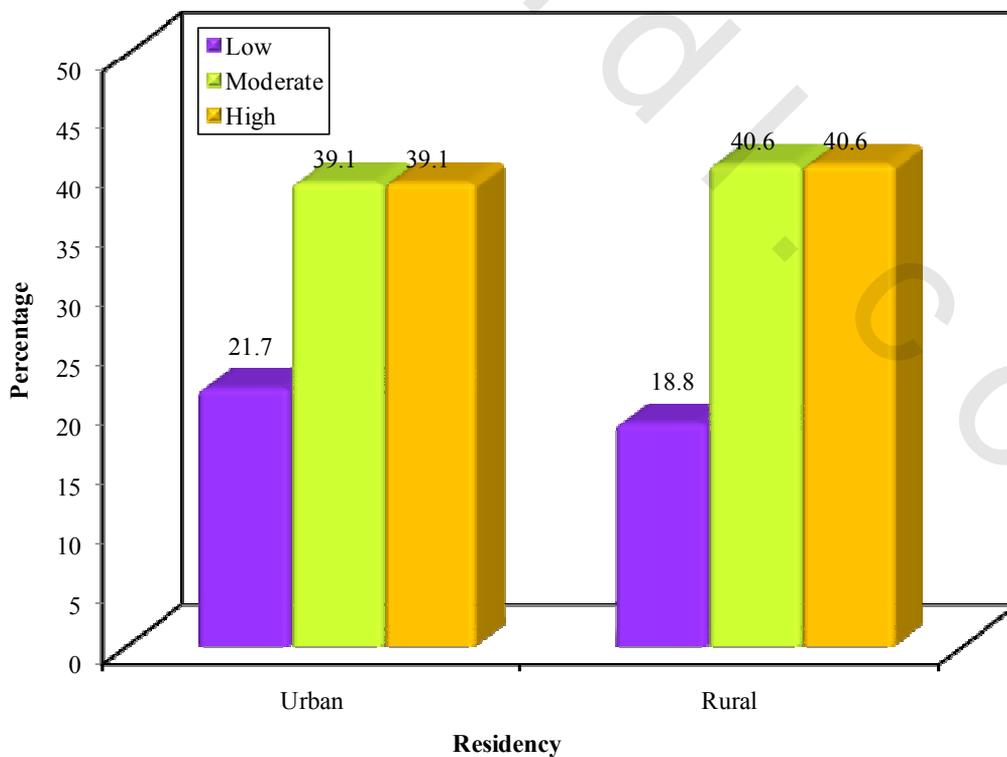


Figure (13): Distribution of the studied sample according to anxiety and age



**Figure (14):** Distribution of studied sample according to anxiety and gender among children and adolescents



**Figure (15):** Distribution of studied sample according to anxiety and residency

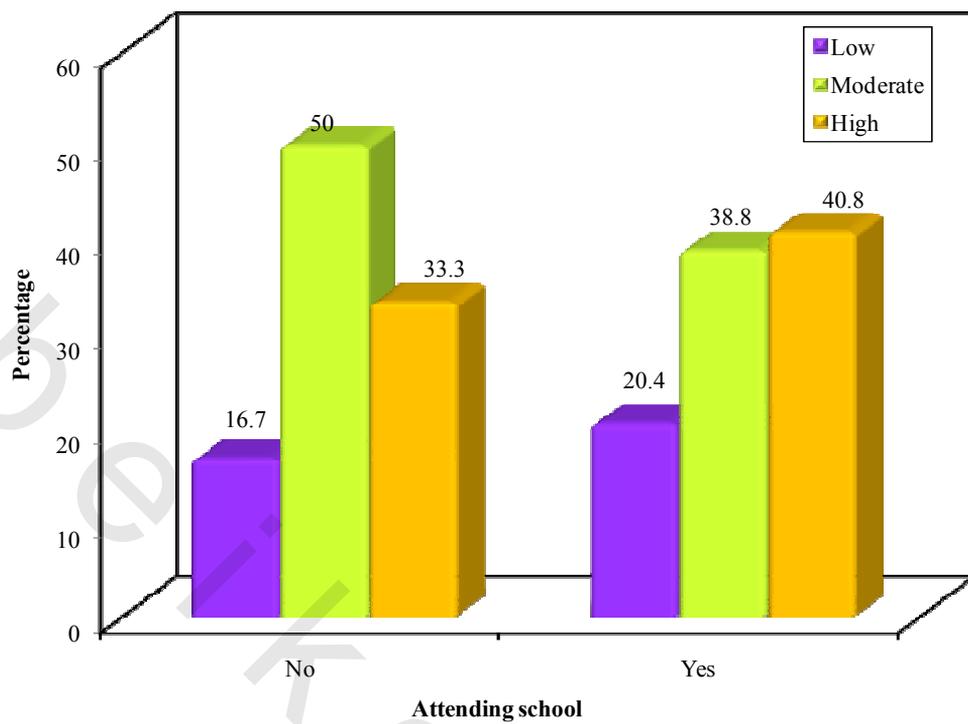
**Table (12):** Distribution of studied sample according to anxiety, school attendance and family structure.

	Anxiety						$\chi^2$	P
	Mild (n=11)		Moderate (n=22)		Severe (n=22)			
	No.	%	No.	%	No.	%		
<b>Attending school</b>								
No	1	16.7	3	50.0	2	33.3	0.419	<sup>MC</sup> p = 1.000
Yes	10	20.4	19	38.8	20	40.8		
<b>Family structure</b>								
Single Parent home	3	27.3	6	54.5	2	18.2	2.896	<sup>MC</sup> p = 0.253
Two Parent home	8	18.2	16	36.4	20	45.5		

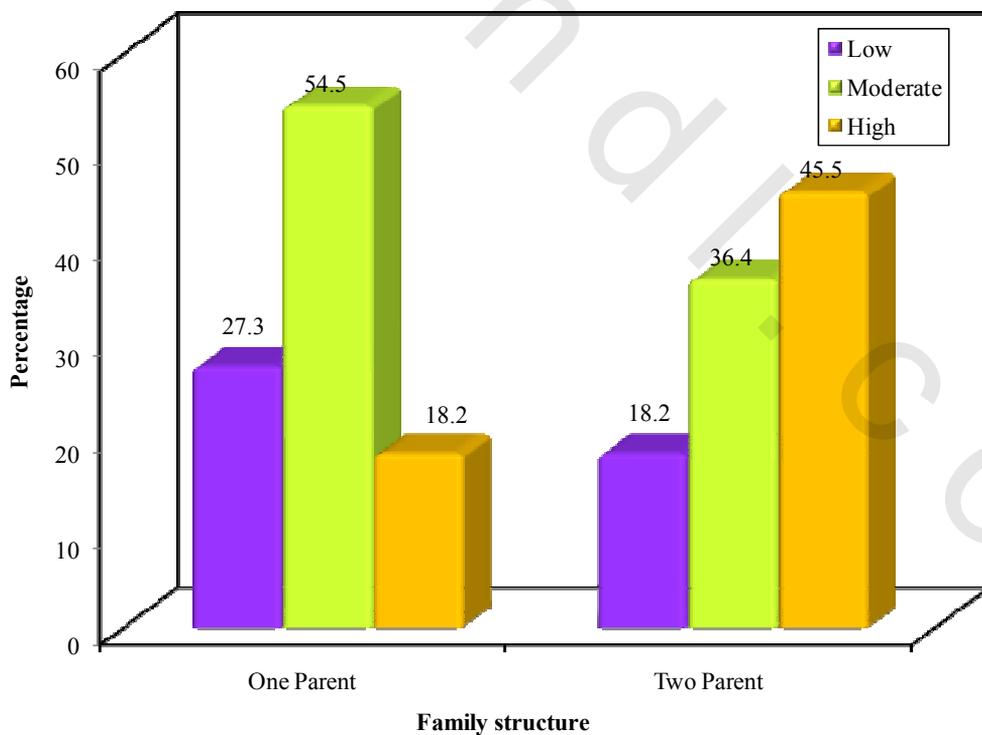
$\chi^2$ : value for Chi square  
MC: Monte Carlo test

School attendance had no statistically significant relationship with prevalence of either anxiety or depression. It was found that 50% of those who didn't attend school had moderate anxiety compared to 38.8% of those who attended school. Also it was found that 40.8% of those who attended school had severe anxiety compared to 33.3% of those who didn't attend (Table 12, Figure 16)

Regarding the family structure among the studied sample, 54.5% of patients who had single parent home had moderate anxiety compared to 36.4% of patients who had two parents home, however this was not statistically significant. (Table 12, Figure 17)



**Figure (16):** Distribution of the studied sample according to anxiety and school attendance



**Figure (17):** Distribution of the studied sample according to anxiety and family structure

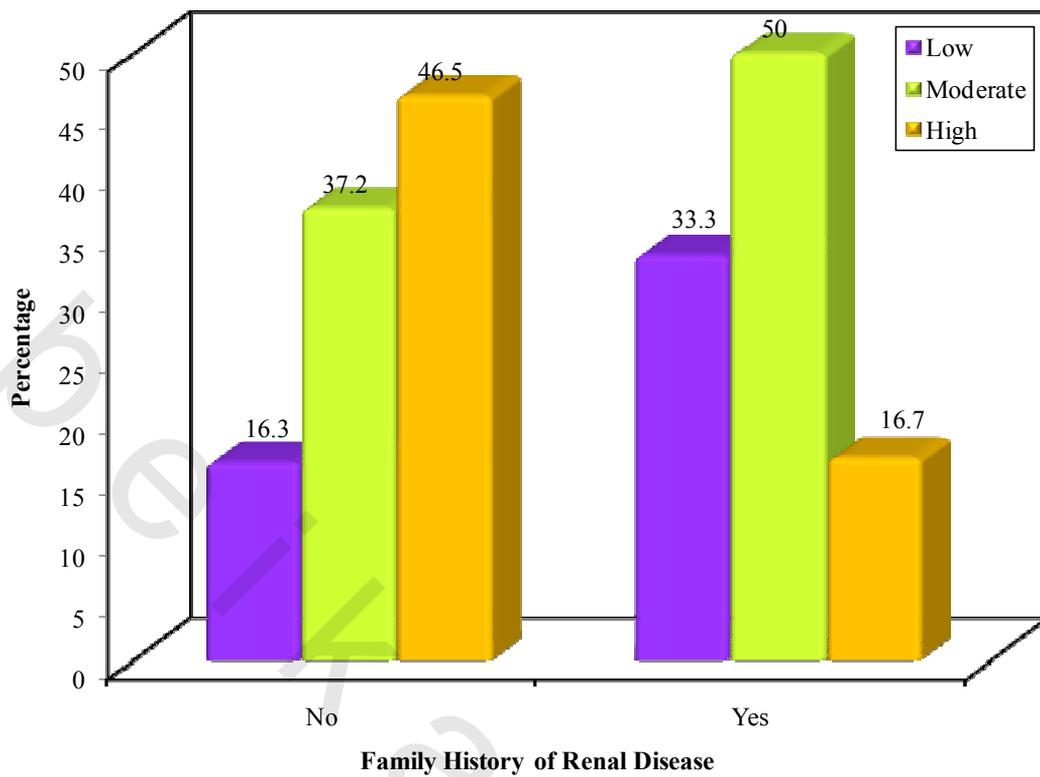
**Table (13): Distribution of the studied sample according to anxiety, presence of family history of renal disease and presence of close friend to confide**

	Anxiety						$\chi^2$	MC p
	Mild (n=11)		Moderate (n=22)		Severe (n=22)			
	No.	%	No.	%	No.	%		
<b>Family History of Renal Disease</b>								
No	7	16.3	16	37.2	20	46.5	3.980	0.182
Yes	4	33.3	6	50.0	2	16.7		
<b>Friend to Confide in</b>								
No	3	27.3	6	54.5	2	18.2	2.893	0.253
Yes	8	18.2	16	36.4	20	45.5		

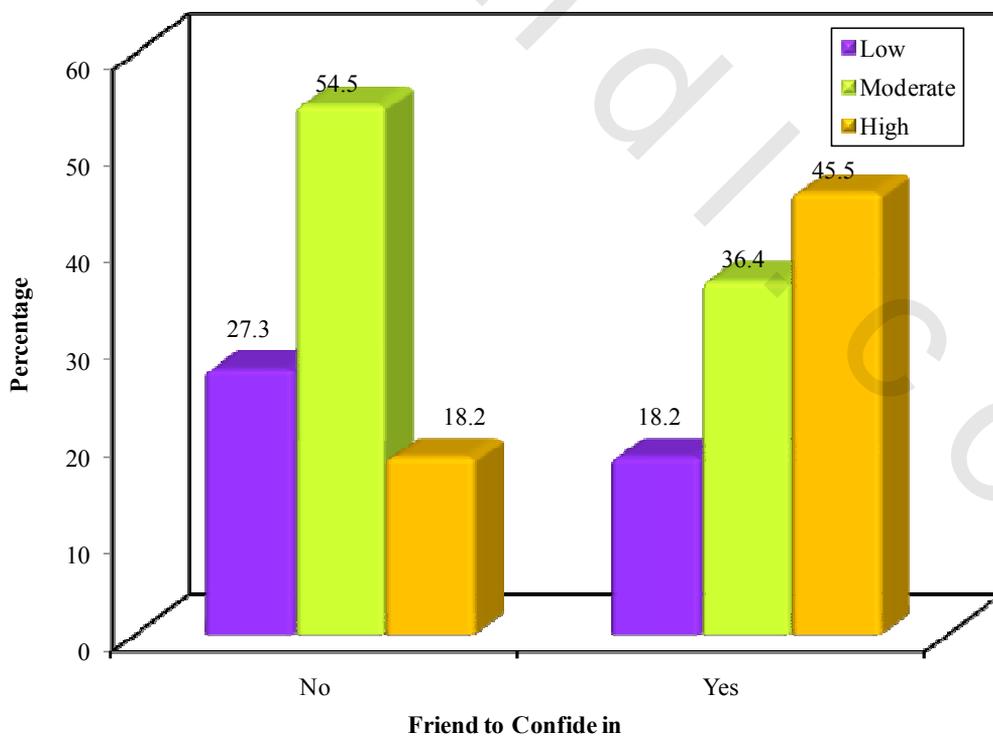
$\chi^2$ : value for Chi square  
MC: Monte Carlo test

Studying the family history of renal disease among CRF patients, 50% of patients who had family history of renal disease had moderate anxiety compared to 37.2 % of patients who didn't have positive family history, but it was not statistically significant. (Table 13, Figure 18)

It was found that 54. 5% of those who had no friend to confide in, had moderate anxiety compared to 36. 4 % of those who had a close friend. In contrast to this result, it was found that 45. 5% of those who had a close friend had severe anxiety compared to 18.2% of those who didn't have a close friend. But there was no significant relationship between anxiety in patients with CRF and presence of close friend to confine in. (Table 13, Figure 19)



**Figure (18):** Distribution of the studied sample according to anxiety and presence of family history of renal disease



**Figure (19):** Distribution of studied sample according to anxiety and presence of close friend to confide in

**Table (14): Distribution of studied sample according to anxiety and different parameters**

	Anxiety						Test of sig.	P
	Mild (n=11)		Moderate (n=22)		Severe (n=22)			
	No.	%	No.	%	No.	%		
<b>Hb (g/dL)</b>								
Min. – Max.	7.10 – 12.70		5.70 – 12.20		4.80 – 12.30		F= 1.454	0.164
Mean ± SD.	9.48 ± 1.67		8.98 ± 1.55		9.01 ± 1.84			
Median	9.0		8.95		8.35			
<b>r<sub>s</sub>(p)</b>	-0.060 (0.666)							
<b>Kt/V (Adequacy of dialysis) (≥1.2)</b>								
Not adequate	1	16.7	0	0.0	5	83.3	$\chi^2= 5.626$	<sup>MC</sup> p = 0.053
Adequate	10	20.4	22	44.9	17	34.7		
<b>Duration of dialysis</b>								
Min. – Max.	0.58 – 8.0		0.42 – 12.0		0.67 – 16.0		<sup>KW</sup> $\chi^2= 6.209^*$	0.045*
Mean ± SD.	2.38 ± 2.27		2.51 ± 2.54		5.31 ± 4.57			
Median	1.0		1.80		3.0			
<b>Sig. bet. stages.</b>	p <sub>1</sub> = 0.875, p <sub>2</sub> = 0.047*, p <sub>3</sub> = 0.030*							
<b>Number of dialysis/wk</b>								
Min. – Max.	2.0 – 3.0		3.0 – 4.0		3.0 – 4.0		F= 0.627	0.875
Mean ± SD.	2.91 ± 0.30		3.09 ± 0.29		3.18 ± 0.39			
Median	3.0		3.0		3.0			
<b>r<sub>s</sub>(p)</b>	0.272* (0.045)							
<b>Socioeconomic status</b>								
Low	6	25.0	6	25.0	12	50.0	$\chi^2= 9.094^*$	0.047*
Moderate	3	12.5	15	62.5	6	25.0		
High	2	28.6	1	14.3	4	57.1		
<b>Sig. bet. stages.</b>	p <sub>1</sub> = 0.463, p <sub>2</sub> = 0.150, p <sub>3</sub> = 0.025*							

$\chi^2$ : value for Chi square, MC: Monte Carlo test, sig.bet. stages was done using Monte Carlo test

<sup>KW</sup> $\chi^2$ : Chi square for Kruskal Wallis test, sig.bet. stages was done using Mann Whitney test

p<sub>1</sub> : p value for comparing between mild and moderate

p<sub>2</sub> : p value for comparing between mild and severe

p<sub>3</sub> : p value for comparing between moderate and severe

F: F test (ANOVA)

r<sub>s</sub>: Spearman coefficient

\*: Statistically significant at p ≤ 0.05

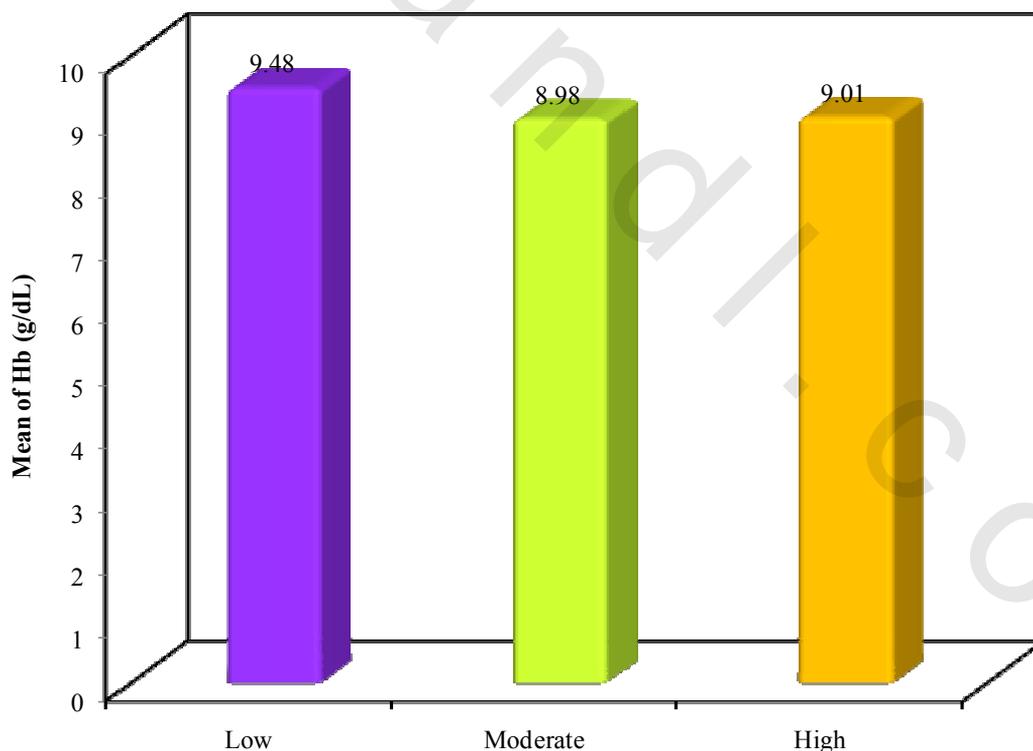
Assessment of the level of hemoglobin showed that the mean hemoglobin level of CRF patients having severe anxiety was 9.01 ± 1.84 while it was 8.98 ± 1.55 in cases of moderate anxiety and 9.48 ± 1.67 in cases of mild anxiety, this was not statistically significant. Also there was negative correlation between anxiety and level of hemoglobin. (Table 14, Figure 20)

Assessment of the adequacy of dialysis (Kt/V) showed that 83.3% of patients who didn't have adequate dialysis (Kt/V < 1, 2) had severe anxiety in comparison to 34.7% of those having adequate dialysis. There was no significant relationship between adequacy of dialysis and prevalence of anxiety. (P value = 0.053). (Table 14, Figure 21).

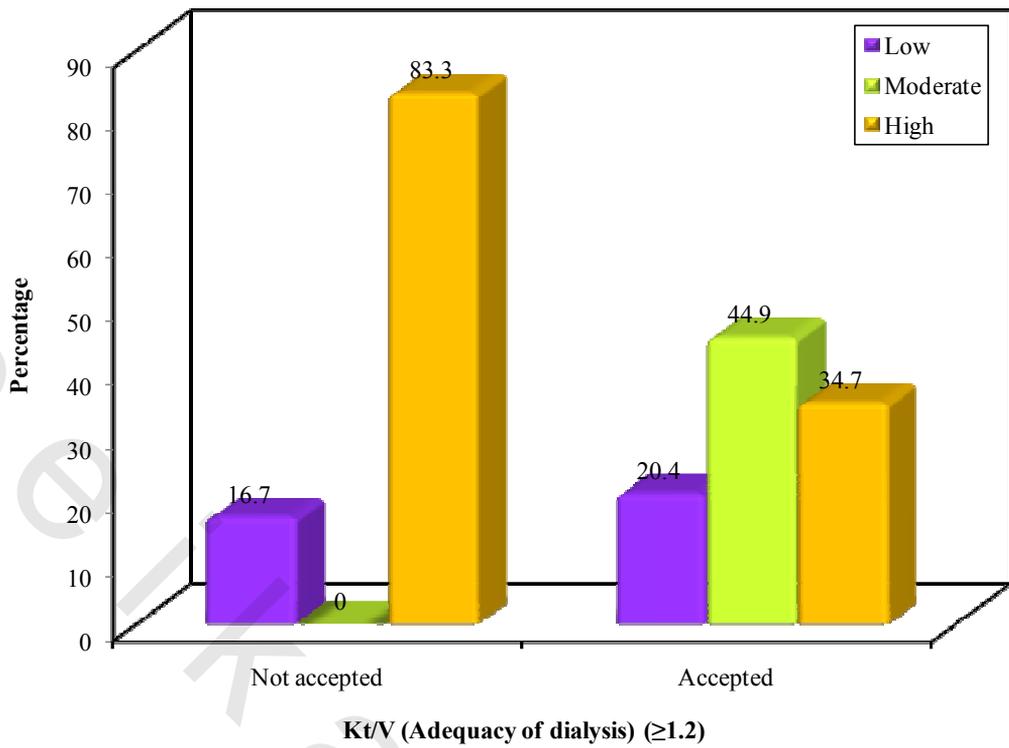
There was wide variations in the duration of dialysis among CRF patients having anxiety, The mean duration was  $5.31 \pm 4.57$  in cases of severe anxiety in comparison to  $2.51 \pm 2.54$  in cases of moderate anxiety and  $2.38 \pm 2.27$  in cases of mild anxiety, which was statistically significant (p value= 0.045)(Table 13). Also there was a positive correlation between anxiety and duration of dialysis ( $r = 0.319$ , p value= 0.018). (table 14, Figure 22, 23).

There was no significant relationship between presence of anxiety in patients with CRF and the number of dialysis sessions per week as we found that the mean number of dialysis sessions/week in patients having severe anxiety was  $3.18 \pm 0.39$  while it was  $3.09 \pm 0.29$  in cases of moderate anxiety and  $2.91 \pm 0.30$  in cases of mild anxiety. (Table 14, Figure 24)

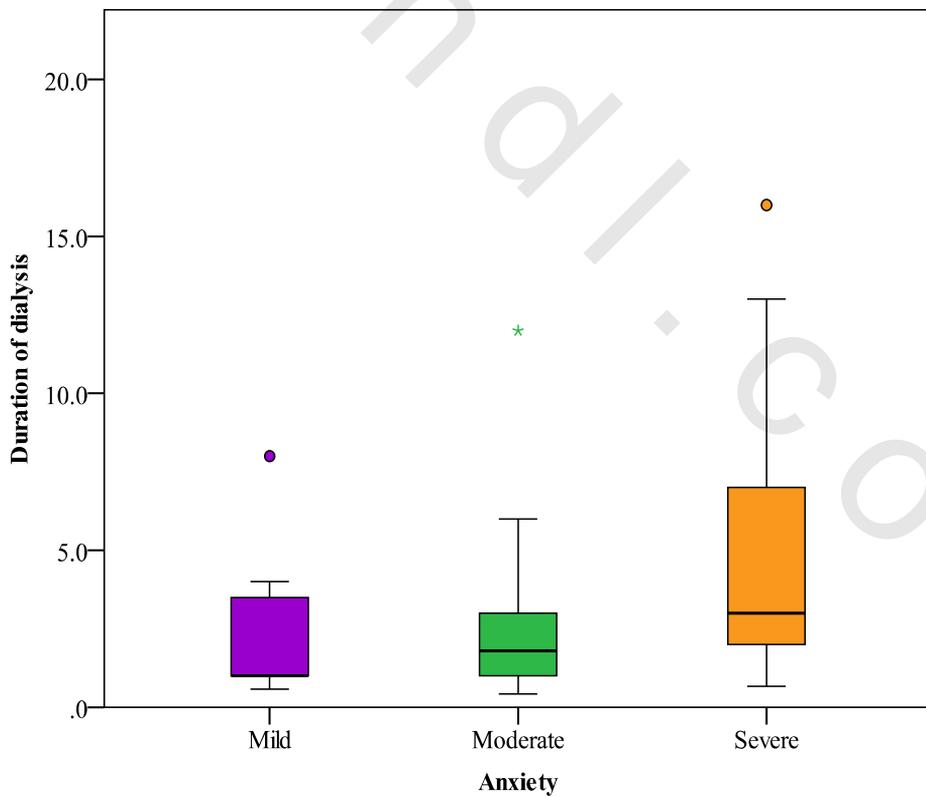
There was significant relationship (p value=0.047) between anxiety in children with CRF and socioeconomic standard as 50% of patients classified as low SES had severe anxiety compared to 25% of patients classified as moderate SES. Also 62.5 % of patients with moderate SES had moderate anxiety compared to 14.3% of those classified as high SES. (Table 14, Figure 25)



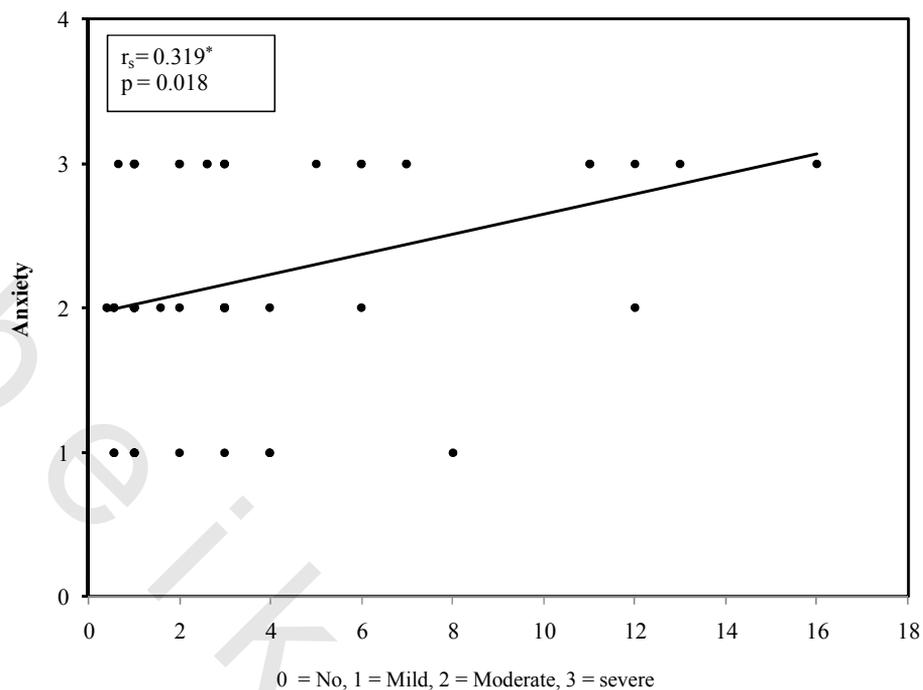
**Figure (20):** Distribution of studied sample according to anxiety and Hb (g/dL)



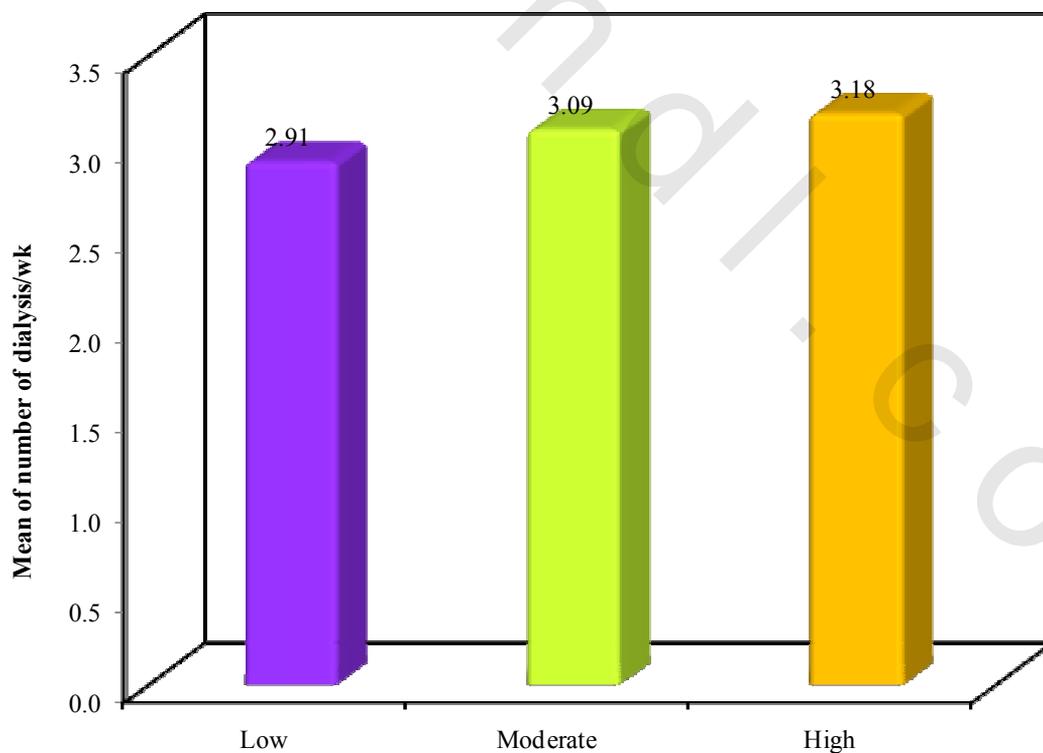
**Figure (21):** Distribution of the studied sample according to anxiety and adequacy of dialysis (KT/V ≥ 1.2)



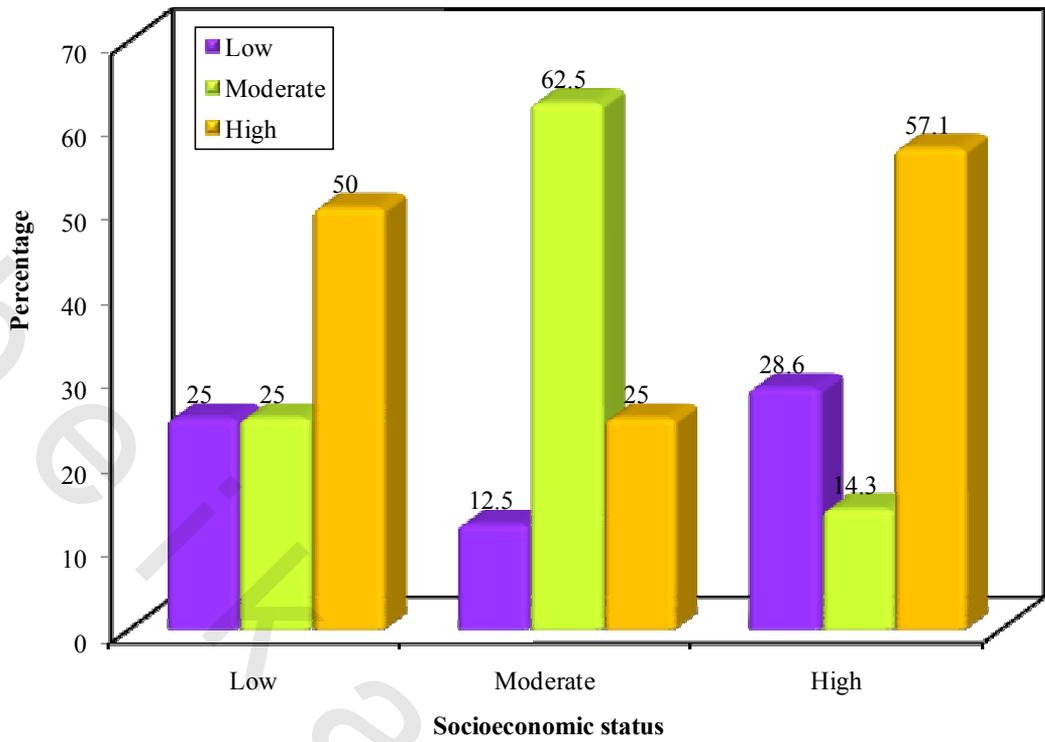
**Figure (22):** Distribution of the studied sample according to anxiety and duration of dialysis (1)



**Figure (23):** Distribution of the studied sample according to anxiety and duration of dialysis (2)



**Figure (24):** Distribution of the studied sample according to anxiety and number of /wk



**Figure (25):** Distribution of the studied sample according to anxiety and socioeconomic status

**Possible associated factors of depression in pediatric patients with CKD undergoing haemodialysis in our study.**

Of the 55 children of the current study, there were 40 patients diagnosed as having depression and 15 patients with no depression on the CDI scale.

In this study, it was found that the majority of those having depression were males. We found that 80% of males had depression in comparison to 64% of females. There was no significant difference in the prevalence of depression among males and females (Table 15, Figure 26).

As regard the age, it was found that most of the studied patients having depression were adolescents (13-18 yrs) .There were 82.4% of adolescents age group had depression ,while only 57.1% of those having (7-12 yrs) had depression and it was statistically significant (p value=0.041) (Table 15,Figure 27).

As regard children group (7-12 yrs), it was found that 66.7% of males had depression while 44.4% of females had depression and it was not statistically significant. (Table 15, Figure 28).

Among adolescents (13-18 yrs), it was found that 88.9% of males had depression while 75% of females had depression and it was not statistically significant too. (Table 15, Figure 28).

Regarding to the residency of the studied group, 52.5% of those who coming from rural areas had depression while 47.5% of those who coming from urban areas had depression .However, it was not statistically significant. (Table 15, Figure 29).

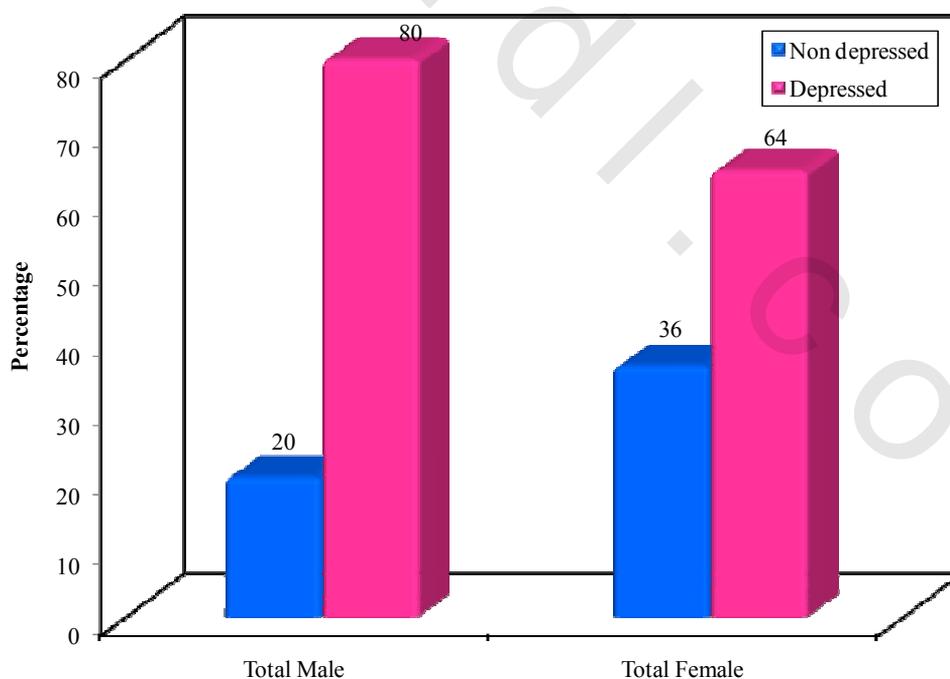
**Table (15):** Distribution of the studied sample according to depression and demographic data

	Depression				Test of Sig.	P
	Non depressed (n = 15)		Depressed (n = 40)			
	No.	%	No.	%		
<b>Gender</b>						
<b>Children (7 – 12 yrs)</b>					$\chi^2=1.037$	FE p=0.396
Male	4	33.3	8	66.7		
Female	5	55.6	4	44.4		
<b>Adolescents (13 – 18 yrs)</b>					$\chi^2=1.124$	FE p=0.387
Male	2	11.1	16	88.9		
Female	4	25.0	12	75.0		
Total male	6	20.0	24	80.0	$\chi^2=1.760$	0.185
Total female	9	36.0	16	64.0		
<b>Age (years)</b>					$\chi^2=4.160^*$	0.041*
7 – 12	9	42.9	12	57.1		
13 – 18	6	17.6	28	82.4		
<b>Residency</b>					$\chi^2=1.946$	0.163
Urban	4	17.3	19	82.6		
Rural	11	34.3	21	65.6		

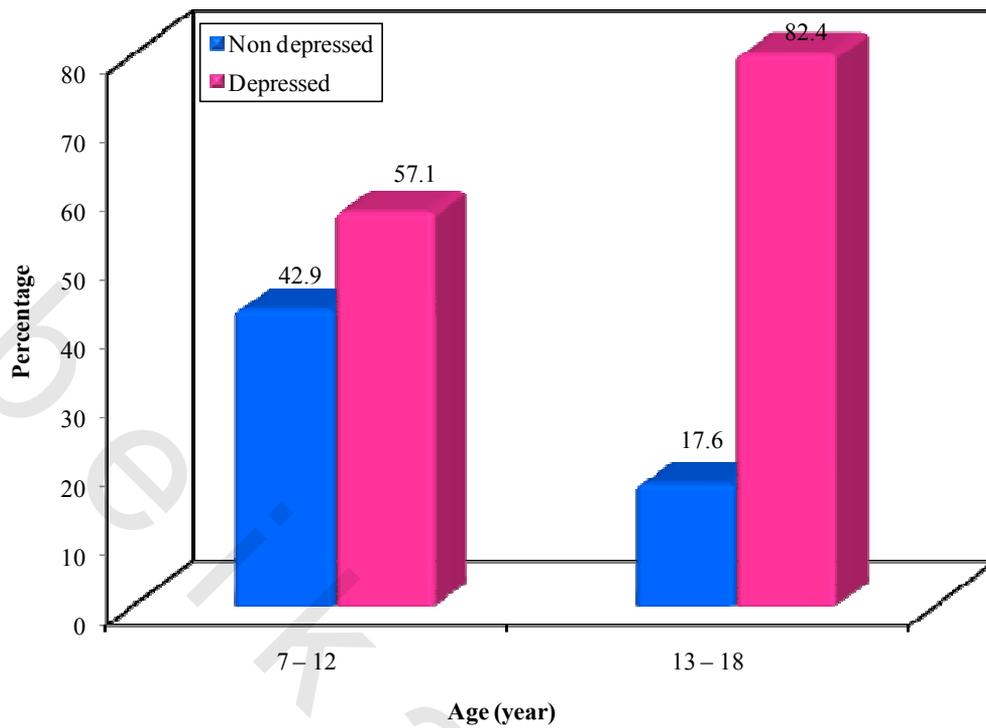
$\chi^2$ : value for Chi square test

FE: Fisher Exact test

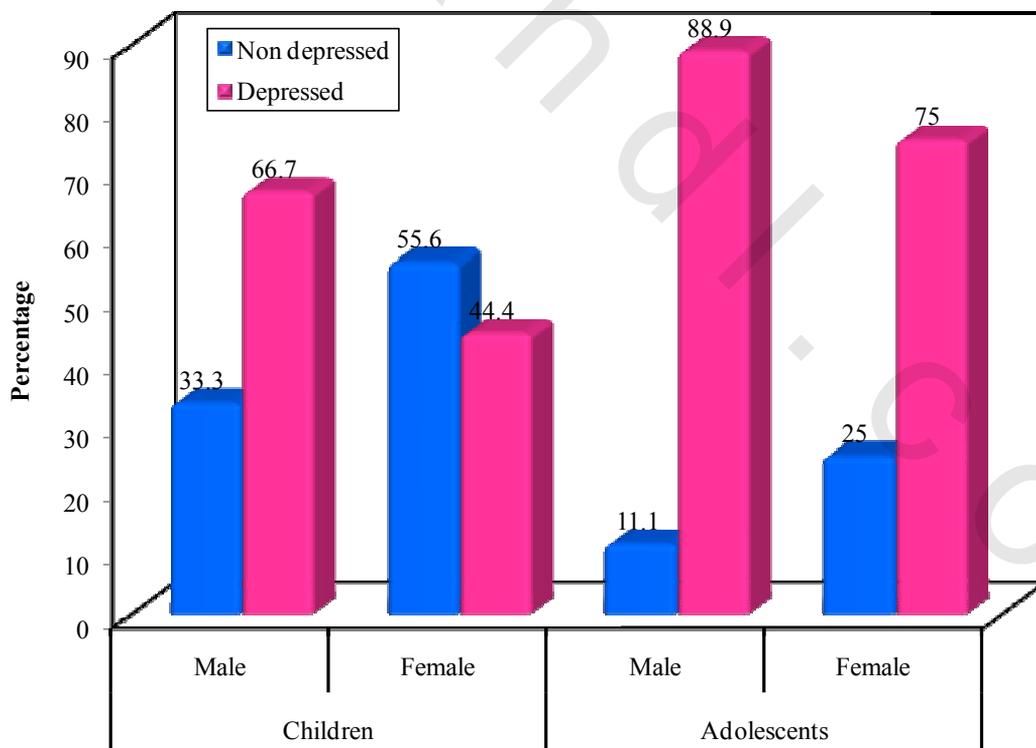
\*: Statistically significant at  $p \leq 0.05$



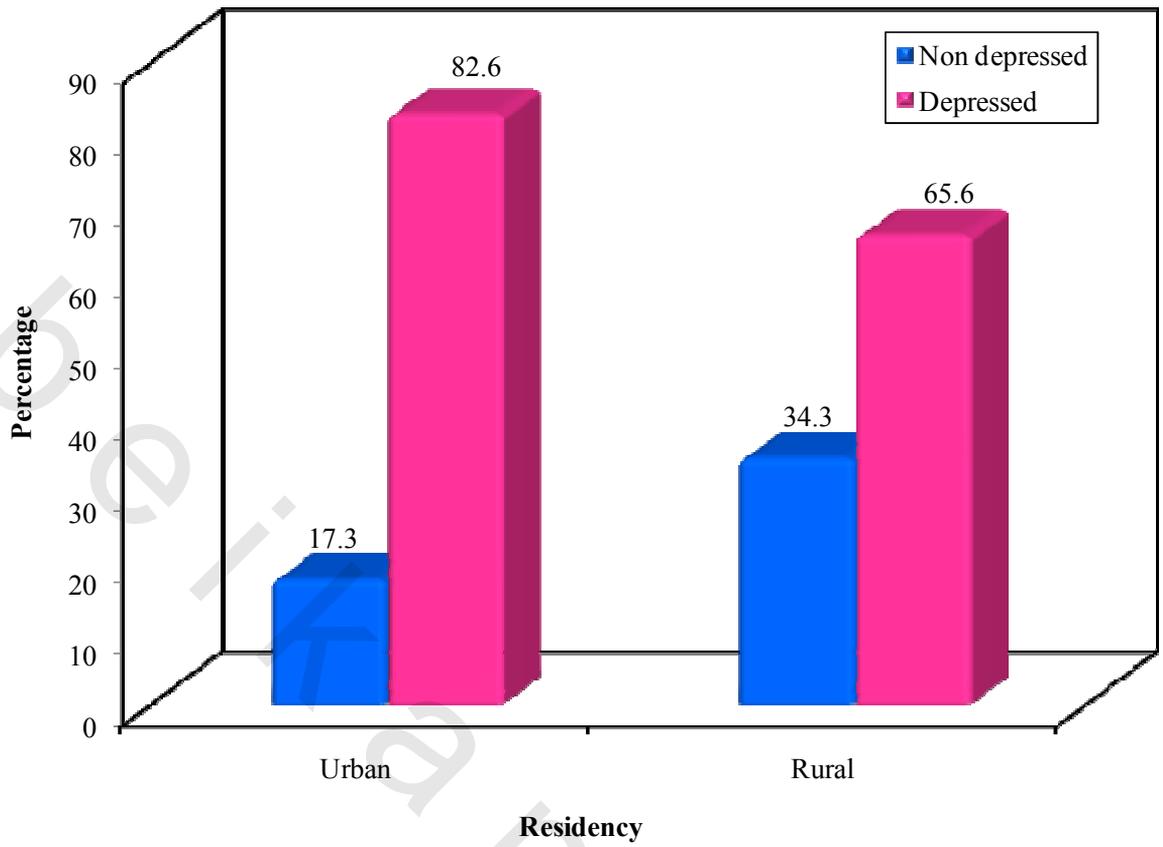
**Figure (26):** Distribution of the studied sample according to depression and gender



**Figure (27):** Distribution of the studied sample according to depression and age



**Figure (28):** Distribution of the studied sample according to depression and age among children and adolescents



**Figure (29):** Distribution of the studied sample according to depression and residency

**Table (16): Distribution of the studied sample according to depression , school attendance and family structure**

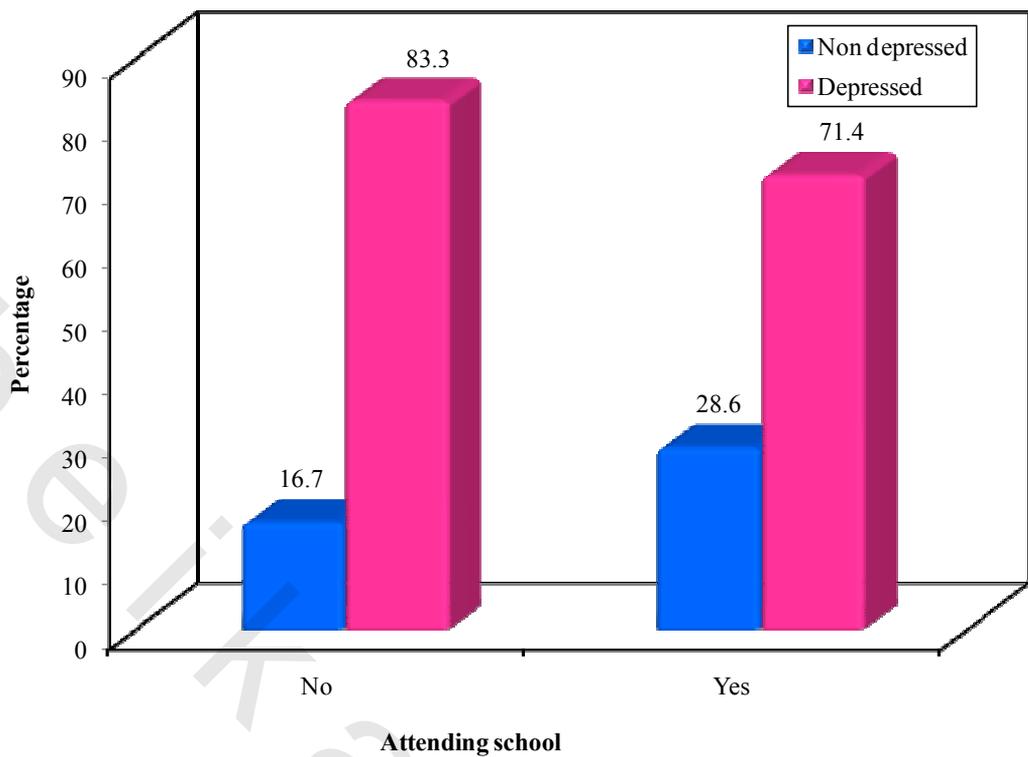
	Depression				$\chi^2$	FE p
	Non depressed (n = 15)		Depressed (n = 40)			
	No.	%	No.	%		
<b>Attending school</b>						
No	1	16.7	5	83.3	0.382	0.669
Yes	14	28.6	35	71.4		
<b>Family structure</b>						
One Parent	3	27.3	8	72.7	0.0	1.000
Two Parent	12	27.3	32	72.7		

$\chi^2$ : value for Chi square test

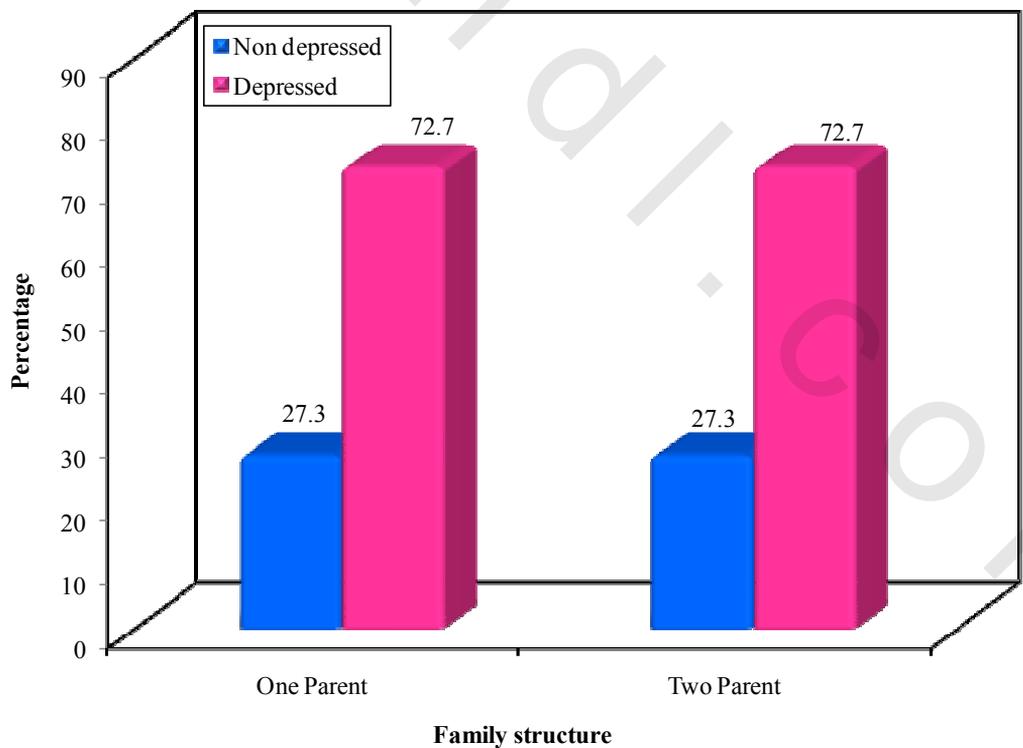
FE: Fisher Exact test

It was found that 83.3% of those who didn't attend school had depression while 71.4% of those who attended school had depression and There was no significant relationship between the prevalence of depression in patients of CRF and attendance of school.(Table 16,Figure 30)

Regarding the family structure among the studied sample, 72.7% of those having single parent home had depression and similar results in those having two parents home and it was not statistically significant. (Table 16, Figure 31).



**Figure (30):** Distribution of the studied sample according to depression and school attendance



**Figure (31):** Distribution of the studied sample according to depression and family structure

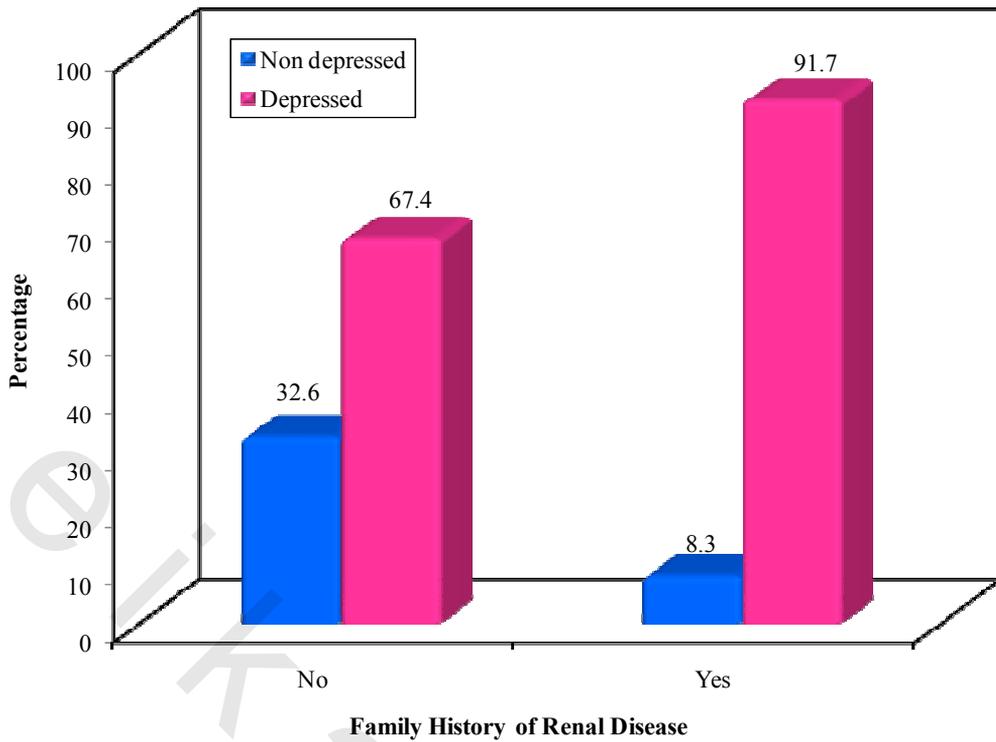
**Table (17): Distribution of the studied sample according to depression, the presence of family history of renal disease and the presence of close friend to confide in**

	Depression				$\chi^2$	FE p
	Non depressed (n = 15)		Depressed (n = 40)			
	No.	%	No.	%		
<b>Family History of Renal Disease</b>						
No	14	32.6	29	67.4	2.776	0.147
Yes	1	8.3	11	91.7		
<b>Friend to Confide in</b>						
No	2	18.2	9	81.8	0.573	0.70
Yes	13	29.5	31	70.5		

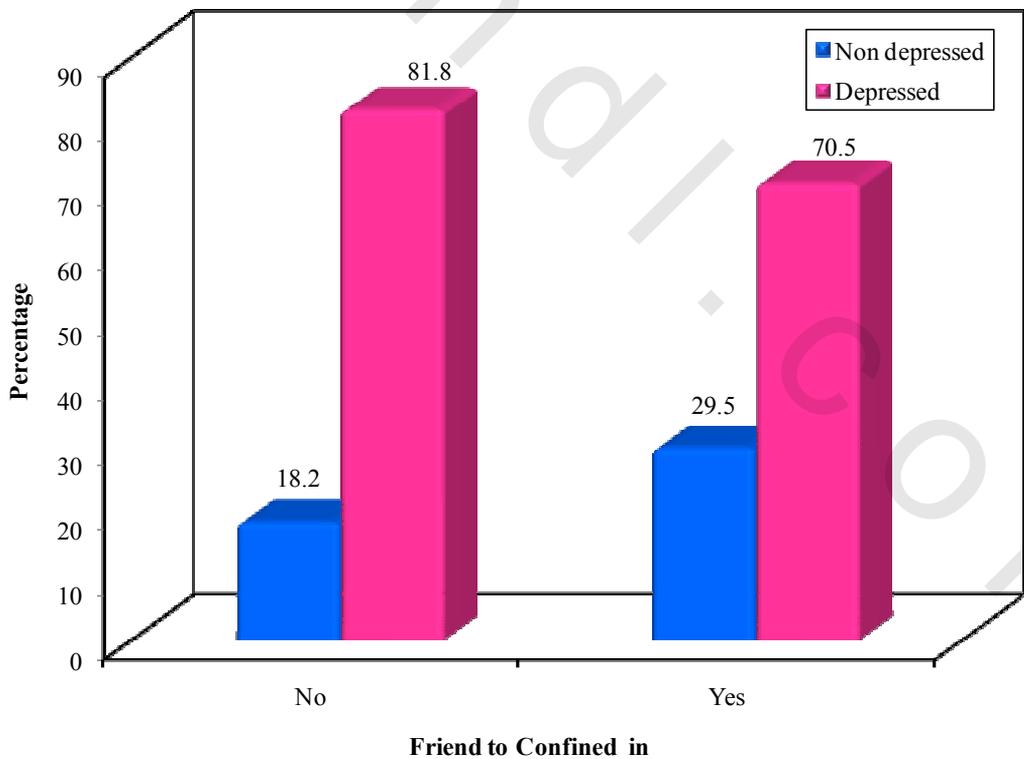
$\chi^2$ : value for Chi square test  
FE: Fisher Exact test

Studying the family history of renal disease among CRF patients, there were 91.7% of those having positive family history had depression compared to 67.4% of those having no family history and it was not statistically significant .(Table 17,figure 32)

There was no significant relationship between depression in patients with CRF and presence of close friend to confide in as it was found that 81.8% of those who didn't have a close friend, had depression compared to 70.5% of those having a close friend to confine in. (Table 17,Figure 33)



**Figure (32):** Distribution of the studied sample according to depression and presence of family history of renal disease



**Figure (33):** Distribution of the studied sample according to depression and presence of close friend to confide in.

Table (18): Distribution of the studied sample according to depression and different parameters

	Depression				Test of sig.	P
	Non depressed (n = 15)		Depressed (n = 40)			
	No.	%	No.	%		
<b>Hb (g/dL)</b>						
Min. – Max.	6.70 – 12.30		4.80 – 12.70		t=2.367*	0.022*
Mean ± SD.	9.93 ± 1.46		8.78 ± 1.66			
Median	10.30		8.30			
<b>Kt/V (Adequacy of dialysis) (≥1.2)</b>					$\chi^2=0.382$	FE p=0.669
Not adequate	1	16.7	5	83.3		
Adequate	14	28.6	35	71.4		
<b>Duration of dialysis</b>						
Min. – Max.	0.58 – 12.0		0.42 – 16.0		Z=0.834	0.404
Mean ± SD.	4.25 ± 3.71		3.36 ± 3.69			
Median	3.0		2.0			
<b>Number of dialysis/wk</b>						
Min. – Max.	3.0 – 4.0		2.0 – 4.0		t=1.918	0.071
Mean ± SD.	3.27 ± 0.46		3.03 ± 0.28			
Median	3.0		3.0			
<b>Socioeconomic status</b>					$\chi^2=4.763$	0.086
Low	9	37.5	15	62.5		
Moderate	3	12.5	21	87.5		
High	3	42.9	4	57.1		

$\chi^2$ : value for Chi square test

FE: Fisher Exact test

t: Student t-test

Z: Z for Mann Whitney test

\*: Statistically significant at  $p \leq 0.05$

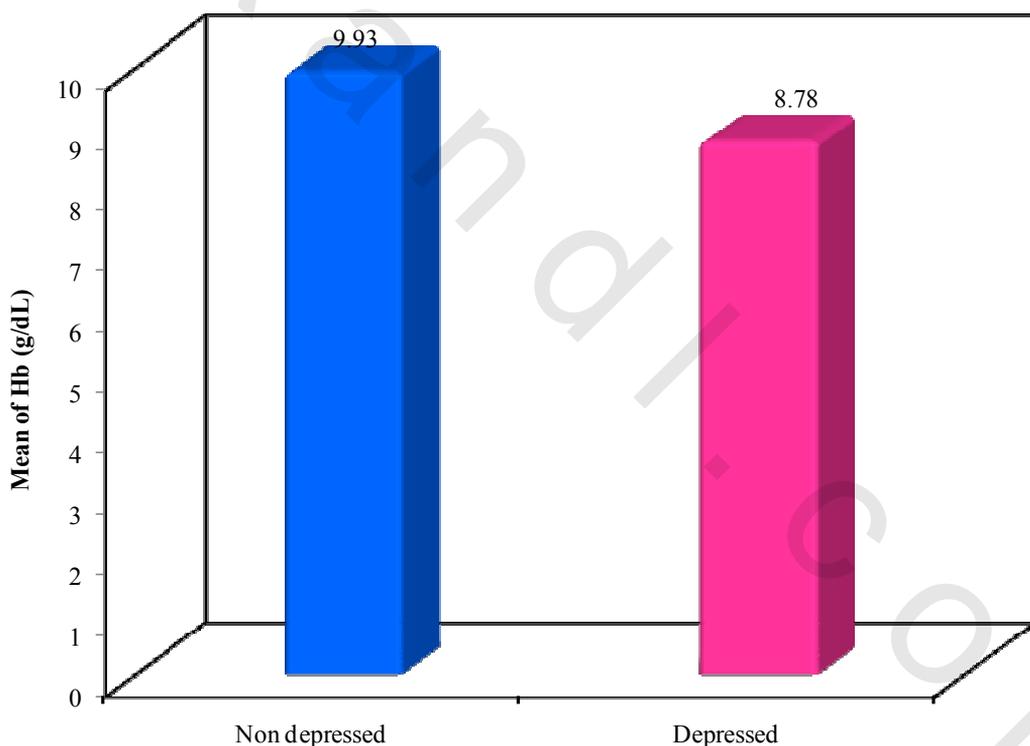
Assessment of the level of haemoglobin showed that the mean haemoglobin level of CRF patients having depression was  $8.78 \pm 1.66$  which was significantly different from the mean haemoglobin level of CRF patients with no depression which was  $9.93 \pm 1.46$  (p value=0.022). (Table 18, Figure 34)

Assessment of the adequacy of dialysis (Kt/V) showed that 83.3% of children who had inadequate dialysis had depression in comparison to 71.4% of children who had adequate dialysis, but no significant relationship between adequacy of dialysis and prevalence of depression was found .(Table 18,Figure 35)

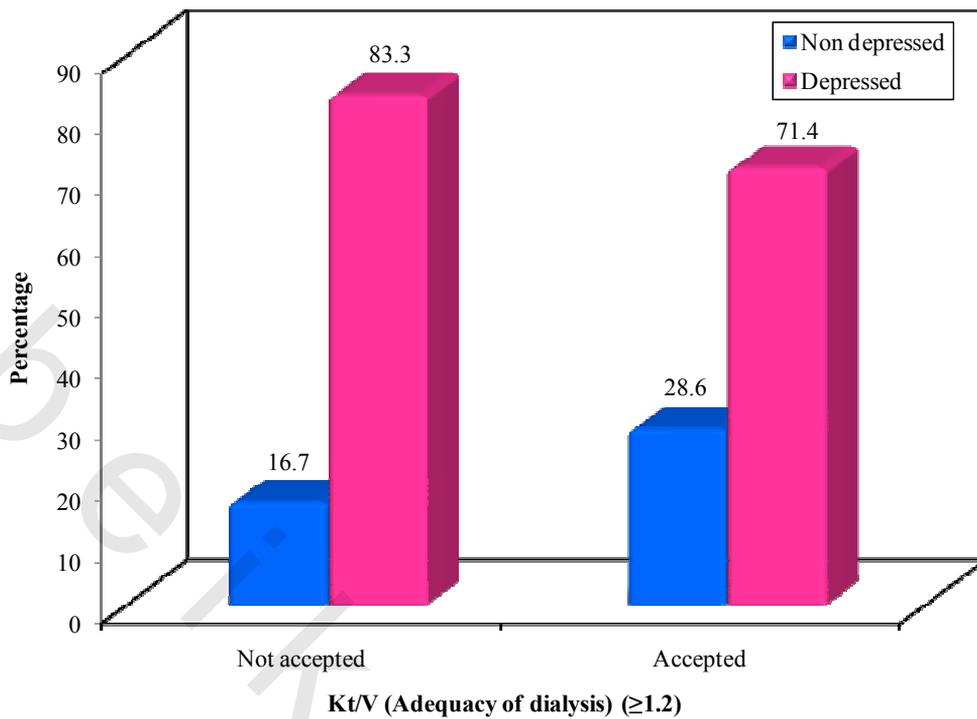
There was wide variations in the duration of dialysis in CRF patients having depression ,ranging from 4 years up to 16 years, however the mean duration was  $3.36 \pm 3.69$  years which was not significantly different from that of CRF children with no depression which was  $4.25 \pm 3.71$  years .(Table 18,figure 36)

There was no significant relationship between presence of depression in patients with CRF and the number of dialysis sessions per week as we found that the mean number of dialysis sessions \week in patients having depression was  $3.03 \pm 0.28$  while it was  $3.27 \pm 0.46$  in patients having no depression. (Table 18, Figure 37)

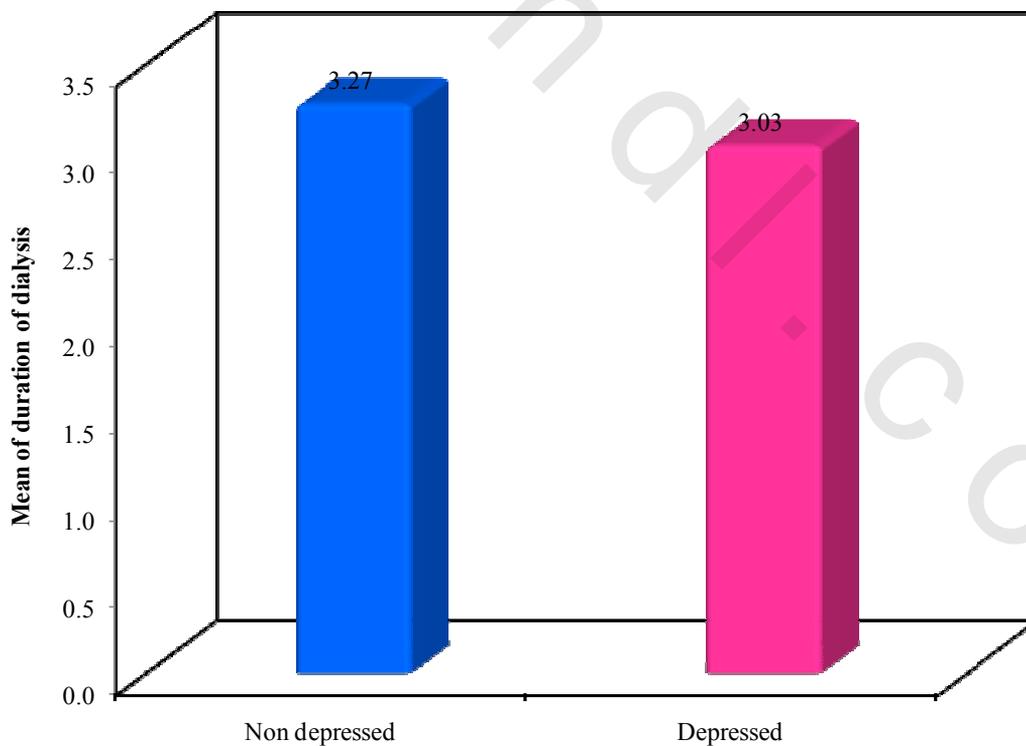
There was no significant relationship (p value=0.086) between depression in children with CRF and socioeconomic standard but we found that 62.5% of those classified as low SES and 87.5% of those classified as moderate SES had depression in comparison to 57.1% of those classified as high SES. (Table 18, Figure 38).



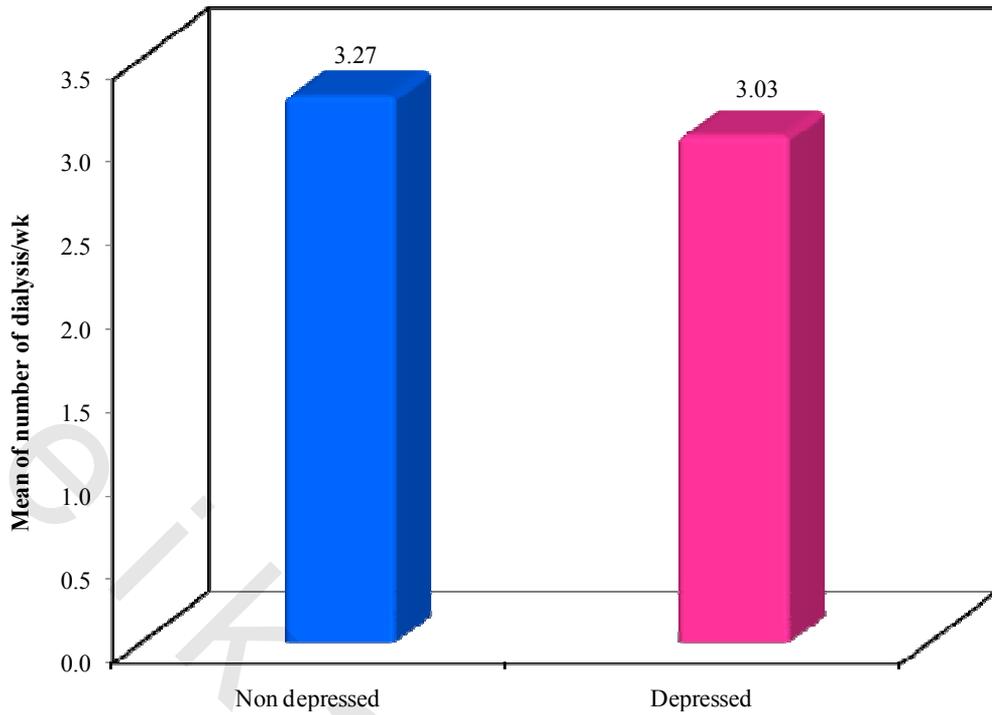
**Figure (34):** Distribution of the studied sample according to depression and Hb (g/dL)



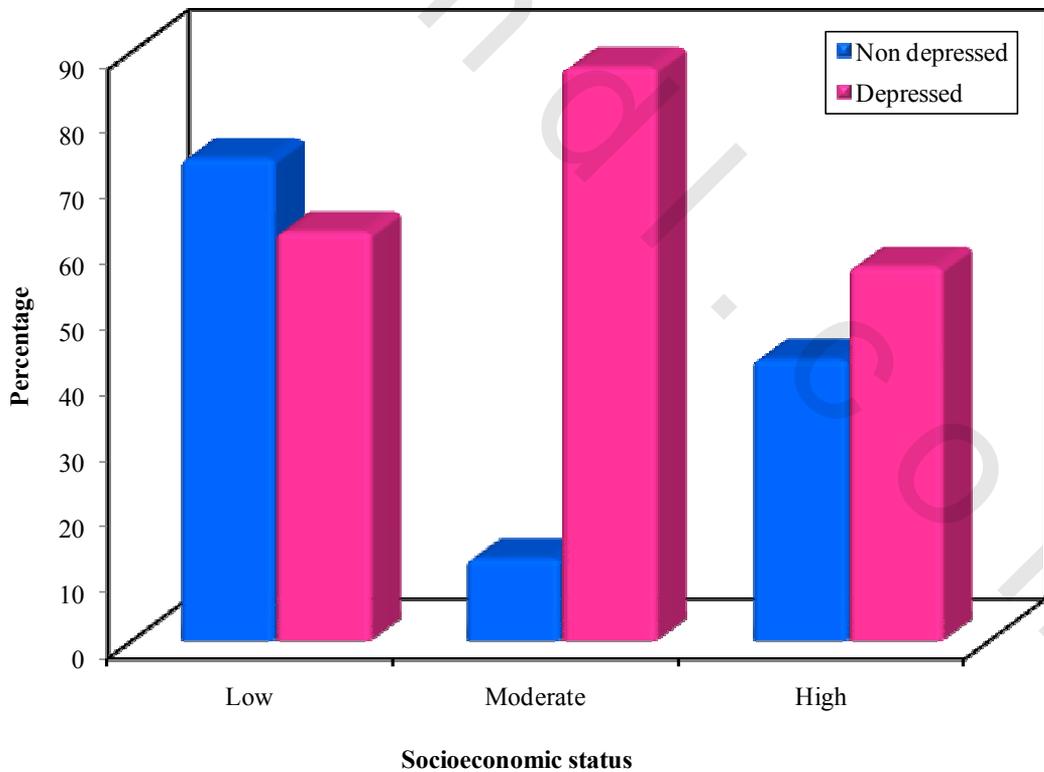
**Figure (35):** Distribution of the studied sample according to depression and adequacy of dialysis ( $Kt/V \geq 1.2$ )



**Figure (36):** Distribution of the studied sample according to depression and duration of dialysis



**Figure (37):** Distribution of the studied sample according to depression and number of dialysis session /wk



**Figure (38):** Distribution of the studied sample according to depression and socioeconomic status