

QUALITY OF LIFE AMONG CAREGIVERS OF PATIENTS WITH CHRONIC RENAL FAILURE UNDERGOING HEMODIALYSIS IN DUHOK CITY

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ABSTRACTS

BACKGROUND: Caregivers of hemodialysis (HD) patients play a critical role in their care which can influence their quality of life. As a result, the present study aimed to examine the quality of life among hemodialysis caregivers and their relationship with some characteristics of caregivers and patients.

SUBJECT AND METHODS: This descriptive cross-sectional survey was directed to assess the quality of life among family caregivers of hemodialysis patients. consecutive sampling was done and included (139) caregivers who had inclusion criteria. The period of data collection was from the 2nd of November 2021 to the 10th of February 2022. The Short Form 36 questionnaire was used to collect data. a p-value of < 0.05 was statistically significant.

RESULTS: Of 139 caregivers, the mean quality of life, physical and mental component scores were 59.49 ± 22.13 , 63.2 ± 25.5 , and 52.7 ± 27.8 respectively. The scores of the physical functioning domain had the highest score (75.4 ± 24.74), while the Energy/Fatigue domain obtained the lowest score (46.19 ± 25.86). There was a significant negative correlation between age and the quality of life ($r = -0.3858$, $P < 0.0001$). Additionally, the quality of life was higher among younger, male, single, educated, and employed caregivers at a p-value (< 0.0001 , $= 0.0003$, < 0.0001 , $= 0.0022$, and $= 0.0091$) respectively.

CONCLUSION: Caregivers of hemodialysis patients had a satisfactory total quality of life score. Energy/Fatigue and mental health, on the other hand, were the most affected domains. These findings emphasize the necessity of addressing the mental health of caregivers, as well as providing them with financial and psychological support.

KEYWORDS: Quality of Life, Chronic Kidney Disease, Hemodialysis, Caregivers, Renal Failure

1. INTRODUCTION

Chronic kidney disease (CKD) is one of the most common health issues, and it's a serious medical, social, and economical issue for patients and their caretakers (Ibrahim *et al.*, 2015). Chronic renal disease kills between 5 and 10 million individuals worldwide every year (Luyckx *et al.*, 2018). The incidence of people suffering from (CKD) is rapidly rising. And over 1.4 million patients globally are anticipated to be getting a renal replacement surgery, with a yearly rise of 8%. Removing wastes from blood is the most common kind of renal restoration, having originally been utilized in 1945 to manage acute kidney injury (Toulia and Koutsopoulou, 2015).

Hemodialysis (HD) is a very intrusive and expensive chronic therapy that involves considerable economic, physical, and psychosocial expenses for the patient and their careers, is one of the most commonly used replacement therapies for chronic renal failing

patients (Tejada-Tayabas *et al.*, 2015). The worldwide burden of CKD patients on the caregiver will increase as the number of people with the disease increases, as will premature death and morbidity, additionally to the low levels of their quality of life (Schoolwerth *et al.*, 2006).

Caregivers are people who willingly take on care of a sick person in a wider sense, usually without being paid (Eirini and Georgia, 2018). Carers are frequently overlooked, and the spotlight has stayed on the patients. Family members are frequently preoccupied with caring for the patient, leading to social separation, deterioration of overall health, inadequate coping capacity, sleep problems, and loss of duty days (Sharma *et al.*, 2021).

Due to the nature of the illness and HD consequences, patients' reliance on carers grows over time. As a result, caring for HD patients has a deep and pervasive impact on caregivers' physical, social, and emotional well-being,

as well as their quality of life (Mashayekhi *et al.*, 2015).

Quality of life (QOL) is a multifaceted notion that incorporates subjective assessments of both good and negative areas of life. It refers to one's cognitive awareness of the disease's or treatment's influence on someone's wellness and general quality of life, which involves physical, mental, and societal components. Individuals' thoughts, life events, personalities, and expectations all have an impact on health-related QOL (Gerasimoula *et al.*, 2015).

As hemodialysis patients are prone to difficulties before, during, and after therapy, they require support with everyday tasks, as well as longer caregiving periods from one or more caregivers who must alter their lives to accommodate the caregiving process. Additionally, there is still a scarcity of information on the QOL of caregivers in Kurdistan Region since most of the present surveys converged on QOL on it is suffering nothing is recognized about the difficulties, tension, and impairment that caretakers confront. So, conducting this research will aid in better understanding the requirements and issues of caregivers, as well as establishing how their quality of life is affected by their caregiving practice and the amount to which care results in pressures on caregivers.

As a result, this study was conducted to provide insight into QOL among HD caregivers. The objectives of the present study were to describe the socio-demographic characteristics of caregivers and patients through a questionnaire designed by the researcher and to determine the association between the QOL of caregivers with their sociodemographic characteristics. Moreover, to determine the association between QOL of patients with some sociodemographic characteristics of the patient.

2. METHODOLOGY

Design of the study: This descriptive cross-sectional survey was directed to assess the quality of life among family caregivers of hemodialysis patients. This study's population encompassed all family carers of hemodialysis patients referred to the hemodialysis unit at the Duhok renal disease and transplantation center. The unit provides 24 hours and 7 days a week. The whole number of the patients under hemodialysis referred to this unit was (164). consecutive sampling was done and included

(139) caregivers who had informed consent and inclusion criteria. The period of data collection was from November 2nd to February 10th, 2022.

The inclusion criteria for the caregivers consisted of being the main caregiver (at patient's choice); age 18 and above; duration of caregiving at least 3 months and above; Caregiver who's willing to participate in the study. The inclusion criteria for patients in this study were that they had been on dialysis for at least 3 months; were age 18 and above; patients who are willing to participate in the study. The exclusion criteria for caregivers were not being the main caregiver; age less than 18; caring for patients less than 3 months. The exclusion criteria for patients were that who had been on hemodialysis for less than 3 months aged less than 18; patients who are unwilling to participate in the study.

Method of data collection: The investigator discussed the purpose and nature of the study with family caregivers who were present in the unit with their patients. The researcher also stressed the right of family caregivers to accept or decline participation in the study. Every family caregiver who agreed to participate in the study was then asked to provide written informed permission. The investigator did an individual interview in 35 minutes.

The following two tools were used to collect data for this study: 1-Structured family caregiver questionnaire: Developed by the investigator. It is divided into two parts: Part I: Family caregivers' demographic characteristics: It covers information such as age, gender, educational level, marital status, and relationship to the patient. Part II: Patient Demographic Characteristics: Age, gender, educational level, Marital status, occupation, duration of hemodialysis

2-Short Form 36 Health Survey Questionnaire (the SF-36): is a 36-item, patient-reported survey of patient health. The SF-36 is widely validated and popularly used in assessing the subjective quality of life (QOL) of patients and the general public.

The SF (36) questionnaire consists of 36 questions covering eight categories of physical function, physical role, emotional role, vitality, mental health, social function, pain, and general health. To get the score for each dimension, add the questions for each dimension and divide the total by the number of questions. To calculate the overall score, add the overall scores from all eight domains and divide by eight. Lesser grades

in this questionnaire imply a lower quality of life, and vice versa, hence the scores for each dimension range from 0 to 100.

Statistical analyses: The general characteristics of caregivers and patients were presented in mean (SD) or number (%). The score of the dimensions of the QoL was determined by mean (SD). The prevalence of comorbidity and chronic diseases were determined in number (%).

The comparisons of dimensions of quality of life (QOL) scores among caregivers with different characteristics were examined in ANOVA one-way. The correlations of total QoL with the duration of care and age of both caregiver and patient and weekly HD were examined in bivariate regression. The predictors of total QoL of caregivers were examined in Standard least squares with effect leverage. The significant

level of difference was determined by a p-value of less than 0.05. The statistical calculations were performed in JMP (JUMP) Pro 14.3.0.

3. RESULTS

Table 1 describes the sociodemographic characteristics of caregivers of hemodialysis patients. The mean age among caregivers was 38 ± 12.9 years ranging from (19-69) with a 95% Confidence Interval of (35.8 ± 11.6 , 40.2 ± 14.7). The predominant age group was between 19-29 years which was (30.9%) and the majority of them were female (66.2%), married (62.6%), Unemployed (74.1%), and spouses (28.8%). In terms of education, (36.7%) of caregivers had primary school education. Concerning residency (65.5%) of them were residents in urban.

Table (1):- General characteristics of caregivers of patients with chronic renal failure

Characteristics (n=139)	No (%)	95% Confidence Interval	
		Lower CI	Upper CI
Age (Range: 19-69 yrs.) mean (SD)	38 (12.9)	35.8 (11.6)	40.2 (14.7)
19-29	43 (30.9)	23.9	39.0
30-39	37 (26.6)	20.0	
40-49	32 (23.0)	16.8	34.5
50-59	15 (10.8)	6.6	30.7
60-69	12 (08.6)	5.0	17.0
			14.5
Gender			
Male	47 (33.8)	26.5	42.0
Female	92 (66.2)	58.0	73.5
Marital status			
Single	49 (35.3)	27.8	43.5
Married	87 (62.6)	54.3	70.2
Widowed	3 (2.2)	0.7	6.2
Employment			
Employed	17 (12.2)	7.8	18.7
Self-employed	19 (13.7)	8.9	20.4
Unemployed	103 (74.1)	66.2	80.7
Education			
illiterate	24 (17.3)	11.9	24.4
Primary school	51 (36.7)	29.1	45.0
Secondary school	26 (18.7)	13.1	26.0
High school	16 (11.5)	7.2	17.9
College and above	22 (15.8)	10.7	22.8
Caregiver			
Son	27 (19.4)	13.7	26.8
Daughter	27 (19.4)	13.7	26.8
Parent	8 (5.8)	2.9	10.9
Sibling	9 (6.5)	3.4	11.8
Spouse	40 (28.8)	21.9	36.8
Others	28 (20.1)	14.3	27.6
Residency			
Rural	48 (34.5)	27.1	42.8
Urban	91 (65.5)	57.2	72.9
Chronic diseases			
No	108 (77.7)	70.09	83.82
Yes	31 (22.3)	16.18	29.91

Note: Divorced was not found among our population.

Table 2 showed that within one day, the hours of caregiving ranged from (4-14 hrs.) with a calculated mean SD of (9.5±2.3). Whereas the median (IQR) for the total duration of care that was performed by the caregivers was 3 years

(5.2 IQR) ranging from (0.25-15 years). Moreover, the majority of the duration of caregiving was between 1-3 years which was (30.9%).

Table(2): -Care-related information of hemodialysis patient caregivers

Characteristics (n=139)	Frequency Distribution	
	Number	Percentage
Care duration at home: 4-14 hrs. Mean (SD)	9.5	2.3
Total care duration: 0.25-15 yrs.	Median: 3	IQR: 5.2
<1 year	35	25.2
1-3 years	43	30.9
4-6 years	33	23.7
≥7 years	28	20.1

IQR: Interquartile range

Table 3 Describes the sociodemographic characteristics of hemodialysis patients. The findings of the current study showed that the mean age among patients on hemodialysis was (55.6 ±13.7) years that were ranged from (19-83) years. The age group of 60-69 had the highest proportion which was (31.7%) (n=44). Concerning gender, more than half (59.7%) of patients were female while the proportion of male patients was (40.3%). With regard to marital status and occupation, most of the participants were married and unemployed

(73.4%) and (78.4%) respectively. With respect to education, nearly half of the patients were illiterate (49.6%). Of patient residency, the majority of them were live in urban (64.7%) (n=90). The majority of patients went to hemodialysis (HD) twice a week (56.8%). The median (IQR) duration of HD for the patients in years ranged from (0.25-15) years was 1.5 (4.5) years. The highest proportion of Duration of HD was less than one year which was (36%). Regarding the Presence of comorbidities, the majority of patients had comorbidity diseases (83.5%).

Table (3): -General characteristics of patients with chronic renal failure undergoing HD

Characteristics (n=139)	No (%)	95% Confidence Interval	
		Lower CI	Upper CI
Age (range: 19-83 years) Mean (SD)	55.6 (13.7)	53.3 (12.3)	58.0 (15.6)
19-29	9 (6.5)	3.4	11.8
30-39	12 (8.6)	5.0	14.5
40-49	17 (12.2)	7.8	18.7
50-59	33 (23.7)	17.4	31.5
60-69	44 (31.7)	24.5	39.8
70-79	22 (15.8)	10.7	22.8
80-89	2 (1.4)	0.4	5.1
Gender			
Male	56 (40.3)	32.5	48.6
Female	83 (59.7)	51.4	67.5
Marital status			
Single	18 (13.0)	8.4	19.5
Married	102 (73.4)	65.5	80.0
Widowed	18 (13.0)	8.4	19.5
Divorced	1 (0.7)	0.1	4.0
Occupation			
Employed	26 (18.7)	13.1	26.0
Self-employed	4 (2.9)	1.1	7.2
Unemployed	109 (78.4)	70.9	84.4
Education			
Illiterate	69 (49.6)	41.5	57.8
Primary school	40 (28.8)	21.9	36.8
Secondary school	13 (9.4)	5.5	15.3
High school	5 (3.6)	1.5	8.1
College and above	12 (8.6)	5.0	14.5
Residency			

Rural	49 (35.3)	27.8	43.5
Urban	90 (64.7)	56.5	72.2
Weekly dialysis frequency			
1	14 (10.1)	6.1	16.2
2	79 (56.8)	48.5	64.8
3	46 (33.1)	25.8	41.3
Duration of hemodialysis (0.25-15 yrs.)			
	Median: 1.5	IQR: 4.5	
<1 year	50 (36.0)	28.5	44.2
1-3 years	44 (31.7)	24.5	39.8
4-6 years	28 (20.1)	14.3	27.6
=>7 years	17 (12.2)	7.8	18.7
Comorbidity			
No	23 (16.5)	11.3	23.6
Yes	116 (83.5)	76.4	88.7

Table 4 lists the average caregivers' quality of life (QOL) dimension scores. The results of the present study showed that the physical functioning dimension obtained the highest mean score (75.4 ± 24.74), followed by Role limitations due to physical health and Pain dimensions which were (64.03 ± 43.83) and (63.22 ± 33.67) respectively. On the other hand, Energy/ fatigue and Emotional well-being had

the lowest mean scores or were the most affected dimensions which were (46.19 ± 25.86) and (48.98 ± 24.77). Concerning the total QOL score, the total mean score was (59.49 ± 22.13) that was ranged from (7.8-95.6). Regarding physical and mental dimensions, the Physical component summary was higher than the mental component summary which was (63.2 ± 25.5) (52.7 ± 27.8) respectively.

Table (4):- Average scores of quality-of-life dimensions of caregivers of HD patients with chronic renal failure

Quality of life dimensions (n=139)	Frequency Distributing	
	Mean	Std Dev
Physical component summary		
Physical functioning	75.4	24.74
Role limitations due to physical health	64.03	43.83
Pain	63.22	33.67
General health	50.07	22.22
Mental component summary		
Role limitations due to emotional problems	55.16	47.26
Energy/ fatigue	46.19	25.86
Emotional well being	48.98	24.77
Social functioning	60.45	37.6
Total QoL score (Range: 7.8-95.6)	59.49	22.13
Physical component summary		
Total score	63.2	25.5
Mental component summary		
Total score	52.7	27.8

Table 5 demonstrates the result of one -way ANOVA tests for different caregiver variables in relation to QOL dimension scores. The results of the current study showed that the dimensions of quality of life were significantly higher among younger, male, single, higher

educated, and employed caregivers at a p-value (<0.0001 , $=0.0003$, <0.0001 , $=0.0022$, and $=0.0091$) respectively. About the dimensions of QoL among caregivers with different relations, the study presented that there was a significant variance between the “types of relationship to

the patient “variable with their total QOL ($p = <0.0001$), in which the highest total QOL mean score was found among son caregivers existed at (73.0 ± 15.4), whereas parent had a lowest mean score that was (25.0 ± 12.5). Hence, the parents who were caring for their offspring had a lower QOL.

Table(5):- Comparisons of QoL scores among caregivers with different characteristics

Characteristics (n=139)	QoL Dimensions								
	PF*	RLPH	RLEP	EF	EW	SF	Pain	GH	QoL total
Agegroup(a)									
19-29	90 (13.0)	77.3 (37.7)	62.8 (47.3)	57.1 (22.9)	54.8 (23.0)	77.9 (28.5)	70.6 (30.8)	61.6 (15.6)	70.9 (13.8)
30-39	77.4 (21.4)	68.9 (42.2)	63.1 (45.0)	47.2 (23.4)	48.4 (23.4)	55.4 (40.5)	62.0 (33.5)	47.3 (22.7)	60.6 (19.6)
40-49	68.9 (25.1)	57.0 (45.5)	49.0 (46.4)	39.1 (27.0)	47.1 (26.0)	48.0 (38.2)	64.1 (35.8)	43.9 (23.3)	53.6 (23.5)
50-59	54.3 (29.6)	28.3 (42.1)	44.4 (49.9)	33.7 (25.8)	28.9 (16.4)	50.2 (36.3)	47.3 (33.3)	39 (14.8)	42.4 (24.7)
60-69	60.4 (28.9)	64.6 (45.8)	33.3 (49.2)	38.8 (28.2)	49.7 (27.7)	59.4 (40.3)	58.1 (36.1)	47.5 (30.6)	52.0 (27.5)
p-value	<0.0001	0.0034	0.1963	0.004	0.0211	0.0046	0.2203	0.0006	<0.0001
Gender (b)									
Male	97.2 (3.6)	100 (0.0)	57.4 (49.0)	52.3 (28.4)	49.2 (25.9)	69.9 (35.2)	76.5 (32.1)	56.6 (22.4)	68.9 (19.5)
Female	67.7 (25.5)	54.9 (45.3)	54.0 (46.6)	43.0 (24.0)	48.9 (24.3)	55.6 (38.0)	56.4 (32.6)	46.7 (21.5)	54.7 (21.9)
p-value	<0.0001	<0.0001	0.6845	0.0445	0.9425	0.0329	0.0007	0.0128	0.0003
Marital status (a)									
Single	94.4 (6.3)	78.1 (38.1)	61.9 (46.1)	52.3 (23.3)	50.8 (22.9)	68.1 (35.8)	70.3 (30.5)	55.0 (18.7)	69.3 (14.3)
Married	70.1 (24.6)	61.9 (45.2)	53.3 (47.5)	43.8 (26.5)	48.9 (25.6)	57.6 (37.8)	61.2 (34.0)	48.0 (23.6)	56.4 (22.9)
Widowed	23.3 (11.5)	8.3 (14.4)	0.0 (0.0)	15.0 (15.0)	21.3 (20.5)	16.7 (28.9)	7.5.0 (13.0)	28.3 (17.6)	17.8 (10.0)
p-value	<0.0001	0.0073	0.0724	0.0183	0.1357	0.0360	0.0042	0.0486	<0.0001
Education(a)									
Illiterate	64.2 (28.4)	52.1 (48.3)	58.3 (45.3)	40.2 (25.9)	47.5 (29.1)	60.4 (41.5)	62.3 (34.9)	40.6 (23.7)	52.7 (27.0)
Primary	69.7 (26.3)	62.7 (45.1)	48.4 (48.7)	38.8 (25.4)	44.2 (23.4)	52.0 (36.8)	56.7 (34.1)	45.7 (23.4)	54.3 (22.8)
Secondary	76.7 (22.8)	56.7 (43.3)	47.4 (47.3)	51.0 (27.4)	50.3 (22.2)	61.5 (36.4)	60.3 (34.8)	48.1 (19.7)	58.8 (20.0)
High school	94.3 (8.1)	82.8 (31.3)	70.8 (43.7)	63.4 (18.2)	54 (25.0)	78.1 (27.2)	65.9 (35.9)	66.6 (14.0)	73.2 (13.8)
College/above	90.2 (9.9)	75.0 (40.8)	65.2 (47.7)	51.6 (23.2)	56.5 (25.1)	65.9 (40.5)	80.8 (23.4)	60.9 (15.6)	69.8 (14.0)
p-value	<0.0001	0.1420	0.3336	0.0050	0.3105	0.1587	0.0817	0.0002	0.0022
Occupation(a)									
Employed	95.4 (5.0)	100 (0.0)	70.6 (47.0)	53.8 (27.2)	64.2 (22.2)	70.6 (38.8)	88.4 (18.0)	60.0 (15.9)	73.1 (16.9)
Self-employed	87.9 (13.8)	100 (0.0)	38.6 (48.8)	45.8 (30.3)	42.7 (27.9)	67.1 (40.0)	65.5 (36.5)	52.1 (26.2)	64.0 (21.1)
Unemployed	70.7 (26.1)	57.5 (45.2)	55.7 (46.5)	45.0 (24.8)	47.6 (23.9)	57.6 (36.9)	58.6 (33.5)	48.1 (22.0)	56.4 (22.3)
p-value	0.0001	<0.0001	0.1250	0.4296	0.0175	0.2917	0.0027	0.1105	0.0091
Relation (a)									
Daughter	79.6 (20.5)	66.7 (41.6)	49.4 (47.5)	44.6 (21.5)	48.3 (22.1)	56.0 (39.7)	58.9 (31.8)	52.6 (18.5)	60.1 (17.4)
Parent	38.1 (24.0)	0.0 (0.0)	0.0 (0.0)	20.6 (10.8)	26.0 (18.5)	20.3 (18.8)	19.7 (17.8)	31.3 (16.0)	25.0 (12.5)
Sibling	71.2 (26.2)	58.3 (50.0)	55.6 (47.1)	36.7 (25.4)	47.6 (17.8)	44.4 (34.9)	64.7 (33.7)	38.9 (18.8)	53.8 (21.4)
Son	97.0 (4.1)	100 (0.0)	61.7 (48.7)	57.6 (25.7)	50.2 (26.6)	81.5 (24.6)	77.8 (31.9)	59.1 (20.4)	73.0 (15.4)
Spouse	65.5 (25.6)	53.1 (46.1)	50.8 (47.7)	37.8 (26.2)	46.5 (25.4)	52.6 (37.6)	58.8 (34.6)	43.1 (24.6)	52.0 (24.1)
Others	78.9(19.4)	73.2(40.2)	72.6(41.6)	59.1(22.2)	59.0(24.5)	72.3(37.0)	71.6(28.4)	57.9(19.5)	68.2(16.1)
p-value	<0.0001	<0.0001	0.0102	<0.0001	0.0320	<0.0001	0.0004	0.0007	<0.0001

Dimensions of QoL: Physical functioning (PF); Role limitations due to physical health (RLPH); Role limitations due to emotional problems (RLEP); Energy/ fatigue (EF); Emotional wellbeing (EW); Social functioning (SF); pain (pain); General health (GH); Total QoL score

(a)ANOVA one-way, (b) T-test was performed for statistical analyses.

Table 6 describes the results of correlation for the duration of care, patient and caregiver’s age, and weekly hemodialysis frequency with their QOL. The findings of this study showed that there was a negative correlation difference between caregivers’ age with their QOL ($r=-0.3858$, $P<0.0001$). Nevertheless, the duration of

caregiving was correlated with the caregiver’s QOL, but it was not highly significant. In terms of patient’s age and weekly hemodialysis frequency, there was no correlation difference between mentioned variables with the caregiver’s QOL. ($r=0.1678$, $P=0.0484$) ($r= -0.0557$, $P=0.5148$).

Table (6):- Correlations of dimensions of QoL with duration of care, patient and caregiver ages and weekly HD frequency

Dimensions of QoL (n=139)	Duration of care r-value (p-value)	Caregiver's Age r-value (p-value)	Patient age r-value (p-value)	Weekly hemodialysis frequency r-value (p-value)
Physical functioning	-0.1629 (0.0554)	-0.4716 (<0.0001)	0.1121 (0.1889)	-0.0225 (0.7930)
Role limitations due to physical health	-0.1610 (0.0583)	-0.2406 (0.0043)	0.1884 (0.0264)	-0.0265 (0.7570)
Role limitations due to emotional problems	-0.0350 (0.6826)	-0.1952 (0.0213)	0.0443 (0.6048)	-0.0161 (0.8505)
Energy/ fatigue	-0.1061 (0.2138)	-0.3055 (0.0003)	0.1724 (0.0424)	-0.0581 (0.4971)
Emotional well being	-0.0994 (0.2444)	-0.1636 (0.0544)	0.0936 (0.2729)	-0.0054 (0.9501)
Social functioning	-0.1179 (0.1668)	-0.2415 (0.0042)	0.1474 (0.0833)	-0.0420 (0.6237)
Pain	-0.1072 (0.2093)	-0.1571 (0.0648)	0.1569 (0.0651)	-0.1439 (0.0910)
General health	-0.1652 (0.0519)	-0.2913 (0.0005)	0.1089 (0.2021)	-0.0910 (0.2868)
Total quality of life	-0.1696 (0.0459)	-0.3858 (<0.0001)	0.1678 (0.0484)	-0.0557 (0.5148)

Bivariate regression was performed for statistical analyses.

Table 7 shows the results of predictors of total QOL. The findings of the existing study showed that having chronic disease among caregivers is a predictor of lowered quality of life among caregivers of chronic renal failure. Also, this finding is illustrated in figure (1), which showed the most predictors of total QOL for caregivers of HD patients.

Concerning total care duration in years, it was a predictor to lower QOL in which the longer duration the more decline in QOL but it is not significant. About the duration of HD in years, the QOL is better among caregivers when the duration of their patients reached 7 years compared to the duration of HD in 1 year in which the QOL is much worse

Table (7):- Predictors of total QoL to caregivers of patients with renal failure

Factors (n=139)	Outcome: Total QoL of caregivers of patients with renal failure Presentation	P-value
Chronic diseases category (caregiver)		0.00005
Age (caregiver)		0.06500
Duration of hemodialysis category		0.06602
Occupation (caregiver)		0.11860
Total care duration (yrs.)		0.13236
Sex (caregiver)		0.23716
Marital status (caregiver)		0.24362
Comorbidities (patient)		0.31154
Age categories (patient)		0.47137
Educational level (caregiver)		0.84766
Residency (caregiver)		0.85279
Gender (patient)		0.89274
Weekly dialysis frequency		0.94945

Standard least squares with effect leverage was performed for statistical analyses.
The bold number shows the predictor.

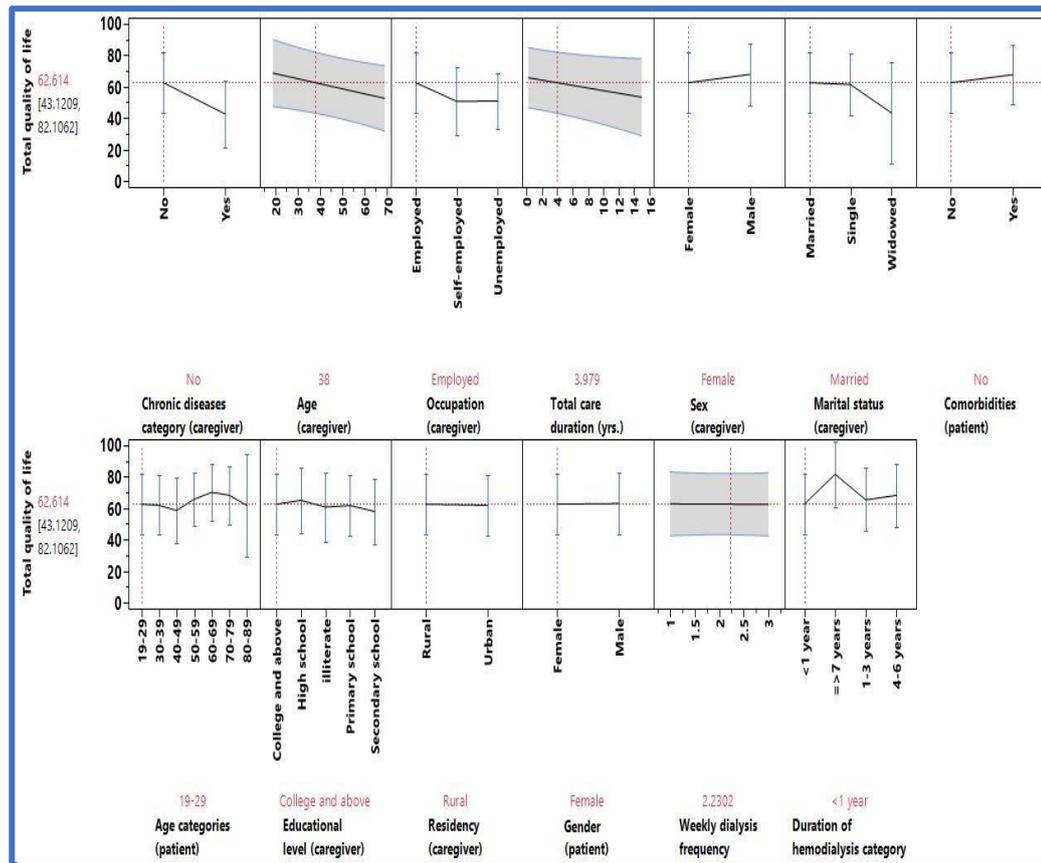


Fig (3): -Profiler of predictors of total QoL to caregivers of patients with renal failure

DISCUSSION

The study's findings showed that the mean score of the caregivers' quality of life obtained to some extent an adequate level, in which the physical functioning dimension obtained the highest mean score. While, Energy/ fatigue and Emotional wellbeing had the lowest scores. The mean quality of life (QOL) score was higher among younger, male, single, highly educated, and employed caregivers.

In terms of quality of life, our study found that the mean QOL score was $59.49 \pm (22.13 \text{ SD})$. The literature reported different QOL scores among caregivers, for example, findings of (Jafari *et al.*, 2018) who evaluated the association between care load and QOL among 246 caregivers of hemodialysis patients using WHOQOL-BREF found that the average QOL score was 76.27 ± 13.67 . A similar score level was reported in another investigation by (Gatua, 2017) ,and their findings were consistent with the findings of our study. While other research found contradictory outcomes (Farzi *et al.*, 2019) conducted a cross-sectional survey among (254) caregivers at Isfahan University of Medical Sciences teaching hospitals in Isfahan

discovered a low level of QOL. Moreover, (Rodrigue *et al.*, 2010) discovered a low quality of life score among carers prior to kidney transplant patients. The reason for obtaining the higher QOL mean score among caregivers in our study was due to factors namely, younger age and having no chronic disease among caregivers compared to the factors that were observed in Farzi being married, elementary level of education, and unemployed resulted in a low QOL mean score and those factors could explain this disparity.

In terms of the Physical Function (PF) domain, most previous studies reported the highest score among other domains. (Nagarathnam *et al.*, 2019) reported the highest score in physical functioning among hemodialysis caregivers who evaluated Qol among three groups of caregivers namely hemodialysis, peritoneal dialysis, and renal transplantation patients. Additionally, this result can be seen in (Monarrez-Espino *et al.*, 2021)and (Belasco *et al.*, 2006). These results were replicated in our study in which PF had the highest score (75.4 ± 24.74). However, (Farzi *et al.*, 2019) reported a contradictory result in which PF had an almost low score. The reason

for this disparity is that in our study we found that young age and having no chronic disease among caregivers are crucial in maintaining physical functioning at high levels. Similarly, the factor that lowered PF among caregivers in the Farzi study was age.

Concerning the Energy/ Fatigue domain, it was the most affected domain in the earlier studies. In (Nagarathnam *et al.*, 2019) study Energy/ fatigue was the most affected domain. Also, this result was replicated in (Farzi *et al.*, 2019). This result is parallel to our study in which E/F had the lowest or not adequate score. This low score implies that HD caregivers may feel exhausted or worn out. Since female and spouse caregivers are under many responsibilities besides their caregiving role.

In the current study, Mental Component Summary (MCS) was lower than Physical Component Summary (PCS). Although MCS was lower than PCS both scores were within the national norm. Also in the same line, these finding was repeated (Nagarathnam *et al.*, 2019). This finding in our study suggests that the young age of caregivers is a remarkable factor in maintaining PCS of QOL within adequate levels. However, (Shdaifat and Manaf, 2012) reported the contradictory result in which both PCS and MCS had low scores. This inconsistency results due to the difference in caregivers ages and a small sample size in which they were 49 caregivers. Another study by (Nagasawa *et al.*, 2018) reported a contradictory result to our study in which PCS had a lower score than MCS and PCS was not within the national norm. Because the mean age of caregivers was (64.5 ± 12.3) . therefore, aging is a notable reason for decreasing physical abilities.

In the present study, there was a substantial difference between caregiver variables and QOL. The QOL was significantly higher among younger age, implying that as the caregiver ages his QOL declines, due to physical difficulties and decreased physical capabilities. this result is consistent with (Francisquini *et al.*, 2020). Moreover, a systematic review done by (Sajadi *et al.*, 2017) reported that there was a significant difference between age and QOL.

There was a significant difference between gender, marital status, and employment with QOL in the current study, revealing that male, single, and employed caregivers had a better quality of life than female, married, and jobless caregivers. One possible explanation for this is that in Kurdish culture, men are less active in

medical care than women, possibly because women are more compassionate towards patients in addition to their home obligations which these factors can decrease QOL. Also, single caregivers have fewer obligations compared to married. One possible explanation for low QOL among the unemployed in our study is that unemployment is frequently linked to issues such as poverty, decreased incomes, and a decline in quality of life. Concerning gender our result goes in the same line with (Martinez-Santos *et al.*, 2021) who investigated the gender impact of caring on the health among 431 caregivers of persons with dementia stated that there was a significant difference between gender and health of caregivers in which the health of males was better than females.

This study discovered a significant association between education and QOL in terms of education. This study found that the higher one's educational level, the greater one's QOL. Education is related to the enhanced individual understanding of life and health, which promotes QOL. This result was in line with a study conducted by (Rha *et al.*, 2015) who evaluated caregiving burden and the quality of life of 227 caregivers of cancer patients discovered that there was a significant difference between educational level and QOL. Contrary to our findings, (Shdaifat and Manaf, 2012) found no correlation between education and QOL. The possibility for this inconsistency stems from the small number of highly educated caretakers and the very small sample size.

In terms of the correlation of age with QOL, our study revealed that there was a negative correlation between the age and QOL of the caregivers, implying that with increased caregiver age his QOL decreases. This can be clarified by the normal physiologic process of aging This result is in line with a study done by (Sajadi *et al.*, 2021) which was performed on 300 family caregivers in the east of Mazandaran province in Iran. Revealed that there was a reverse and significant correlation between the age of caregiver with the variable of caregivers' quality of life ($P < 0.001$) using short form (SF8). Whereas a positive correlation was reported by (Queiroz *et al.*, 2018) who investigated the correlation between sociodemographic characteristics of 35 caregivers with elderly people with dementia and QOL. This disparity in Queiroz's study due to the fact that can be clarified by the effects of care on an individual's personal, social,

professional, and health life, with older caregivers having different professional and social requirements than their younger counterparts, who require reorganization in all aspects of their lives when providing care and so, as a result, the younger caregivers suffer a decline in their quality of life, another explanation could be a small sample size.

In terms of QOL predictions, the current study discovered that having a chronic disease among caregivers was a predictor of lower QOL. In addition to caring for their patients, family caregivers with chronic conditions were obliged to bear the suffering produced by their own diseases. This resulted in a decline in their health and quality of life (Zou, 2014). Similar to the current study's findings, the findings of a study done by (Mirhosseini *et al.*, 2021) in Turkey aiming at assessing the QoL of family caregivers of cancer patients revealed that caregivers with chronic conditions reported lower QoL.

One of the primary drawbacks of the current study was that we were unable to enroll a big enough sample size due to the continuous renal transplantation, as well as the high mortality rate among patients on hemodialysis, for which we lost one patient each time. Furthermore, the measurement of the amount of self-care level among patients was not measured, which has an influence on caregivers' QOL.

CONCLUSION

In the current study, caregivers of hemodialysis patients experienced a relatively adequate quality of life score. HD caregivers had higher physical functioning and lowest score in Energy/Fatigue domain. Younger age, male, single, employed, and highly educated caregivers were associated with higher QOL. Also, from this study, we can say that presence of chronic disease among caregivers is a highly significant predictor of lowered QOL.

RECOMMENDATIONS

A variety of proposals and treatments have been presented to meet the requirements of caregivers. These findings emphasize the need of addressing caregivers' mental health by providing effective psychosocial support. Additionally, it has been advocated that caregiver be better prepared to care for their patients and enroll in educational programs, particularly in the early phases of their work.

Additionally, supportive interventions should be implemented for higher a risk groups of caregivers namely, older age, female, married, unemployed, spouses, and parent caregivers.

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