

# Quality of Life Among Peritoneal Dialysis Patients: A Cross-sectional single-centre experience

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## ABSTRACT

**Introduction:** The quality of life of dialysis patients with end-stage renal disease has a significant impact on their prognosis. Renal dialysis is the most commonly used treatment for end-stage-renal disease patients.

**Objective:** To determine the impact factors affecting the quality of life in end stage renal disease patients, treated with peritoneal dialysis in Riyadh, Kingdom Saudi Arabia.

**Method:** This cross-sectional research involved patients with end-stage-renal disease who underwent peritoneal dialysis at Riyadh, Saudi Arabia, between June and July 2021. Patients that had been on dialysis for  $\geq 1$  year were included. The Arabic version of the Quality-of-Life Index–Dialysis (QLI-D) version III was used.

**Results:** A total of 37 respondents completed the questionnaire. The QLI score was  $21.80 \pm 4.4$ , while the subscales for health and functional, social and economic, psychological/spiritual, and family were  $19.35 \pm 4.9$ ,  $21.52 \pm 5.4$ ,  $24.23 \pm 4.9$ , and  $25.74 \pm 4.7$ , respectively. Diabetes is significantly correlated with health and functional subscale ( $p=0.046$ ) while cardiovascular disease is significantly associated with psychological/spiritual subscale ( $p=0.001$ ). No association was found between socio-demographic characteristics and QoL ( $p>0.05$ ).

**Conclusion:** Patients demonstrated relatively high scores in quality-of-life index as well as in four subscale scores. This study revealed that patients were most satisfied with their family subscale while being least satisfied with their health and functional subscale.

**Keywords:** end-stage renal disease, peritoneal dialysis, quality of life, cardiovascular disease, diabetes, cross-section

## INTRODUCTION

Chronic kidney disease (CKD) is a condition that worsens over time, leading to a gradual decline in kidney function. Untreated CKD can advance to end-stage renal disease (ESRD).<sup>1</sup> CKD and ESRD present intense challenges for multiple nations and are significant global medical and general health concerns.<sup>2, 3</sup> Other chronic diseases, including cardiovascular disease (CVD) and diabetes, are closely associated with CKD and continue to be the main reasons for early mortality and illness in CKD patients.<sup>4</sup> Besides, the principal ESRD causalities are high blood pressure and diabetes.<sup>5-8</sup>

Globally, the increasing incidence of ESRD has significantly impacted many aspects of people's lives, including overall quality of life (QoL), physical health, and mental health.<sup>9-12</sup> Multiple factors can influence the QoL of ESRD patients, including dialysis quality, sodium levels, hemoglobin levels, comorbidities, age, and socioeconomic status.<sup>13-15</sup> Psychological factors are also essential in expecting patient QoL and adherence.

ESRD treatment includes kidney transplantation, peritoneal dialysis (PD), and hemodialysis (HD).<sup>16</sup> The primary ESRD treatment aims are to handle related complications and delay disease exacerbation. Regardless of kidney transplantation effectiveness, dialysis has appeared as the leading ESRD treatment modality for ESRD because transplantation has many limitations, including cost, complexity, and appropriate donor availability.<sup>17</sup> PD is a treatment method that enables patients to continue their daily tasks and provides them with better flexibility and independence.<sup>18-21</sup>

Health-related quality of life (HRQOL) is associated with clinical outcomes and survival for ESRD patients and is considered a crucial measure of their well-being.<sup>22-25</sup> Considering the anticipated upsurge in ESRD incidence and healthcare expenditure, it is essential to determine effective interventions for ESRD patients.<sup>26-28</sup> In recent years, QoL has been more commonly used as a vital measure to evaluate the effectiveness of chronic conditions [such as ESRD] interventions or treatment.<sup>29-33</sup> In Saudi Arabia, 7% of all patients with ESRD are on PD.<sup>34</sup> Comprehending how ESRD influences a patient's life is imperative to advance and handle ESRD.<sup>35</sup> Nevertheless, such research is limited in Saudi Arabia. Therefore, the aim of this study was to enhance the literature by examining the QoL in patients diagnosed with ESRD treated with PD in Riyadh, Kingdom of Saudi Arabia.

## METHODS

### Study design, setting, and participants

Adult patients (aged 18 years) with ESRD who consented to participate in this cross-sectional study and underwent peritoneal dialysis in Riyadh, Saudi Arabia, between June and July 2021, were included. Excluded in this study were under 18 years old and did not consent to participate.

### Study tool and survey administration

The Arabic version of the Ferrans and Powers Quality of Life Index–Dialysis version III (QLI-D) was used to determine the QoL in this study.<sup>36</sup> Participants' consent was asked thru phone call and the questionnaire is administered in an easy-to-understand language.

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### Quality of life index–dialysis version III

The QLI-D is divided into four subscales: health and functioning, social and economic, psychological/spiritual, and family. Furthermore, the translated version's content validity was determined to be adequate.<sup>37</sup> The QLI-D is made up of 33 question pairs, each of which assesses the satisfaction and importance levels. A six-point Likert scale is used to score all questions. The satisfaction scale ranges from 1 (very dissatisfied) to 6, and the importance scale ranges from 1 (very unimportant) to 6 (very important). The overall and subscale scores ranged from 0 to 30, with higher values indicating better QoL.

### Outcomes

The primary outcome is to assess the QoL of patients diagnosed with ESKD and underwent peritoneal dialysis.

### Statistical analysis

SPSS version 29 (IBM Corp., Armonk, NY) was used to encode and present the data. The frequency and percentages of categorical variables were presented. The QLI-D questionnaire scores were summarized using the mean and standard deviation. One-way ANOVA and unpaired t-test were used to evaluate the difference in the mean QoL score based on patients' socio-demographic characteristics (overall score and subscales). Pearson correlation coefficient was employed to examine the correlation between QoL and subscales. Association between socio-demographic characteristics and comorbidities with the QoL was performed using binary logistic regression analysis. The dummy variable used to define the dependent variable in the regression model was defined as the mean score of the study participants.

### RESULTS

In this cross-sectional study, the questionnaire was completed by 37 participants. The majority of respondents (40.5%) were 51-70 years old, male (59.5%), married (64.9%), and attended university (37.8%). In terms of employment, 40.5% of the population was unemployed, 35.1% were employed, and only 24.3% had retired. Moreover, more than half of the respondents (54.1%) earned between 5000 and 10000 Saudi riyals. In terms of comorbidities, 51.4% have diabetes, 75.7% have hypertension, and 27.0% have cardiovascular disease. The majority of the respondents (54.1%) had been on dialysis for 0-1 year. All respondents in this study (100%) came from KFMC. Peritoneal adequacy testing revealed that 51.4% had a result of <1.7 kt/v, while 48.6% had a result of ≥1.7. (Table 1).

Table 2 shows the overall mean QLI and subscale scores. The QLI score was 21.80±4.4, while the subscales for health and functional, social and economic, psychological/spiritual, and family were 19.35±4.9, 21.52±5.4, 24.23±4.9, and 25.74±4.7, respectively. Figure 1 shows that the family subscale scored the highest of all.

Quality of Life Index was found to be significantly correlated with HFSUB, SOCSUB, PSPSUB, and FAMSUB (all p<0.001). HFSUB has a significant correlation with SOCSUB, PSPSUB, and FAMSUB (all p<0.001), whereas SOCSUB has a significant correlation with PSPSUB and FAMSUB (all p<0.001). Furthermore, the findings revealed a significant correlation between PSPSUB and FAMSUB (p<0.001) as shown in Table 3.

**Table 1.** Sociodemographic characteristics of peritoneal dialysis patients

Variables	Count	%
Total	37	100.0

Age	18-30	5	13.5
	31-50	13	35.1
	51-70	15	40.5
	>70	4	10.8
Gender	Male	22	59.5
	Female	15	40.5
	Married	24	64.9
Marital Status	Single	5	13.5
	Widowed	4	10.8
	Divorced	4	10.8
Education	Lower than elementary school	6	16.2
	Elementary school	1	2.7
	Middle school	3	8.1
	Secondary school	9	24.3
	University	14	37.8
	Post-grade	4	10.8
Employment	Employed	13	35.1
	Un-employed	15	40.5
	Retired	9	24.3
Income	<5000	12	32.4
	5000-10000	20	54.1
	10000-15000	2	5.4
	>15000	3	8.1
DM	Yes	19	51.4
	No	18	48.6
HTN	Yes	28	75.7
	No	9	24.3
CVD	Yes	10	27.0
	No	27	73.0
Years on dialysis	0-1 year	20	54.1
	1-5 years	12	32.4
	5-10 years	5	13.5
HD Center	KFMC	35	100.0
	Missing	2	
Kt/v	< 1.7	19	51.4
	≥ 1.7	18	48.6

**Table 2.** Mean scores of quality of life and the other four subscales

Variables	N	Min	Max	Mean	SD
QLI	36	7.18	28.63	21.80	4.4
HFSUBa	36	4.20	28.47	19.35	4.9
SOCSUBb	36	8.00	29.06	21.52	5.4
PSPSUBc	36	12.93	30.00	24.23	4.9
FAMSUBd	36	5.30	30.00	25.74	4.7

**Table 3.** Correlation between quality of life and subscales

Correlation	HFSUBa	SOCSUBb	PSPSUBc	FAMSUBd	
QLI	r	0.916**	0.893**	0.852**	0.824**
	p-value	<0.001	<0.001	<0.001	<0.001
	N	36	36	36	36
HFSUBa	r		0.729**	0.639**	0.691**
	p-value		<0.001	<0.001	<0.001
	N		36	36	36
SOCSUBb	r			0.745**	0.639**
	p-value			<0.001	<0.001
	N			36	36
PSPSUBc	r				0.717**
	p-value				<0.001
	N				36

\*\* . Correlation is significant at the 0.01 level (2-tailed).

**Table 4.** Quality-of-life score stratified by socio-demographic characteristics

Demographics		Total	QLI	HFSUBa	SOCSUBb	PSPSUBc	FAMSUBd
Age	18-30	5	23.55 ± 4.9	21.91 ± 5.1	23.79 ± 5.9	24.20 ± 5.6	26.50 ± 4.9
	31-50	13	21.87 ± 5.3	19.91 ± 5.6	21.53 ± 5.9	24.38 ± 5.4	24.77 ± 6.4
	51-70	15	20.78 ± 4.1	18.07 ± 4.8	20.10 ± 5.4	23.47 ± 5.0	25.86 ± 3.7
	>70	4	23.20 ± 1.0	19.23 ± 1.1	23.98 ± 2.7	26.68 ± 2.5	27.28 ± 1.9
<b>p-value</b>			<b>0.591</b>	<b>0.481</b>	<b>0.450</b>	<b>0.734</b>	<b>0.797</b>
Gender	Male	22	22.37 ± 4.3	19.93 ± 4.7	22.41 ± 5.6	24.76 ± 5.0	25.91 ± 3.6
	Female	15	20.99 ± 4.6	18.53 ± 5.2	20.27 ± 5.1	23.49 ± 4.9	25.51 ± 6.1
<b>p-value</b>			<b>0.361</b>	<b>0.403</b>	<b>0.248</b>	<b>0.454</b>	<b>0.804</b>
Marital Status	Married	24	22.65 ± 3.2	19.74 ± 3.9	23.11 ± 4.0	25.11 ± 4.4	26.57 ± 3.5
	Single	5	20.75 ± 6.2	19.84 ± 6.6	18.96 ± 7.8	21.49 ± 6.5	25.04 ± 2.8
	Widowed	4	20.74 ± 3.9	18.03 ± 4.5	18.20 ± 5.0	25.21 ± 4.5	26.48 ± 2.7
	Divorced	4	19.28 ± 8.1	17.79 ± 9.2	18.91 ± 7.9	21.66 ± 6.2	21.13 ± 10.7
<b>p-value</b>			<b>0.459</b>	<b>0.840</b>	<b>0.134</b>	<b>0.328</b>	<b>0.190</b>
Education	Lower than elementary school	6	20.95 ± 3.9	17.61 ± 4.0	20.27 ± 4.5	24.00 ± 5.9	26.65 ± 2.9
	Elementary school	1	21.82 ± 0.0	20.40 ± 0.0	16.94 ± 0.0	27.43 ± 0.0	26.50 ± 0.0
	Middle school	3	20.45 ± 2.8	18.04 ± 1.6	18.60 ± 4.3	22.40 ± 5.8	27.47 ± 2.8
	Secondary school	9	20.74 ± 4.4	18.75 ± 4.8	19.31 ± 5.0	23.26 ± 4.5	25.11 ± 3.9
	University	14	21.95 ± 5.3	19.55 ± 6.0	22.70 ± 5.9	24.07 ± 5.4	24.81 ± 6.5
Post-grade	4	25.67 ± 1.9	23.15 ± 3.3	27.00 ± 2.3	27.68 ± 2.4	27.40 ± 2.2	
<b>p-value</b>			<b>0.563</b>	<b>0.639</b>	<b>0.148</b>	<b>0.709</b>	<b>0.889</b>
Employment	Employed	13	23.27 ± 4.5	21.21 ± 5.3	23.54 ± 6.3	24.54 ± 5.4	26.83 ± 2.9
	Un-employed	15	20.42 ± 4.9	18.07 ± 5.1	18.98 ± 4.9	23.18 ± 5.2	25.18 ± 6.4
	Retired	9	22.13 ± 2.9	18.99 ± 3.3	23.07 ± 3.3	25.59 ± 3.8	25.22 ± 3.3
<b>p-value</b>			<b>0.246</b>	<b>0.251</b>	<b>0.053</b>	<b>0.507</b>	<b>0.629</b>
Income	<5000	12	20.99 ± 4.5	19.01 ± 5.0	19.55 ± 5.6	22.84 ± 5.5	26.34 ± 2.7
	5000-10000	20	21.71 ± 4.7	18.68 ± 5.1	21.79 ± 5.5	25.06 ± 4.7	25.32 ± 6.0
	10000-15000	2	25.01 ± 1.9	23.85 ± 0.3	26.81 ± 1.8	25.04 ± 5.8	25.35 ± 0.2
	>15000	3	23.43 ± 3.1	21.89 ± 4.1	24.17 ± 2.8	24.05 ± 5.1	26.27 ± 3.6
<b>p-value</b>			<b>0.615</b>	<b>0.420</b>	<b>0.238</b>	<b>0.690</b>	<b>0.946</b>

**Table 5.** Quality-of-life score stratified by comorbidities and dialysis information

Demographics		Total	QLI	HFSUBa	SOCSUBb	PSPSUBc	FAMSUBd
DM	Yes	19	21.10 ± 4.5	17.82 ± 4.9	21.18 ± 5.2	24.39 ± 5.0	25.58 ± 5.8
	No	18	22.58 ± 4.3	21.05 ± 4.4	21.89 ± 5.8	24.05 ± 5.0	25.92 ± 3.2
<b>p-value</b>			<b>0.319</b>	<b>0.046<sup>a</sup></b>	<b>0.701</b>	<b>0.838</b>	<b>0.830</b>
HTN	Yes	28	21.27 ± 4.4	18.65 ± 4.8	21.05 ± 5.6	23.81 ± 5.0	25.46 ± 5.0
	No	9	23.65 ± 4.0	21.80 ± 4.6	23.17 ± 4.8	25.71 ± 4.6	26.71 ± 3.7
<b>p-value</b>			<b>0.181</b>	<b>0.108</b>	<b>0.335</b>	<b>0.345</b>	<b>0.516</b>
CVD	Yes	10	23.00 ± 1.6	19.25 ± 3.1	22.63 ± 3.5	27.41 ± 2.0	27.86 ± 1.7
	No	27	21.34 ± 5.0	19.38 ± 5.5	21.09 ± 6.0	23.01 ± 5.2	24.93 ± 5.2
<b>p-value</b>			<b>0.143</b>	<b>0.944</b>	<b>0.453</b>	<b>0.001<sup>b</sup></b>	<b>0.094</b>
Years on dialysis	0-1 year	20	22.02 ± 4.7	18.90 ± 5.0	22.18 ± 5.9	25.25 ± 5.0	25.85 ± 5.7
	1-5 years	12	22.21 ± 3.9	20.67 ± 5.1	21.94 ± 4.1	23.10 ± 4.5	25.83 ± 3.3
	5-10 years	5	19.47 ± 4.6	17.61 ± 4.0	16.94 ± 5.5	22.52 ± 6.2	24.95 ± 2.9
<b>p-value</b>			<b>0.542</b>	<b>0.475</b>	<b>0.202</b>	<b>0.384</b>	<b>0.941</b>
Kt/v	< 1.7	19	21.24 ± 5.1	19.22 ± 5.5	20.83 ± 5.7	23.35 ± 5.7	24.60 ± 5.6
	≥ 1.7	18	22.35 ± 3.6	19.47 ± 4.4	22.20 ± 5.2	25.11 ± 4.0	26.88 ± 3.3
<b>p-value</b>			<b>0.456</b>	<b>0.882</b>	<b>0.455</b>	<b>0.292</b>	<b>0.148</b>

<sup>a</sup>-significant using Independent t-test at <0.05 level.

<sup>b</sup>-significant using Welch's t-test at <0.05 level.

**Table 6.** Predictors of better quality of life

Variables		Odds ratio of higher QoL score	P-value
Age	18-30 (Reference category)	1.00	
	31-50	1.20 (0.15-9.77)	0.865
	51-70	1.33 (0.17-10.74)	0.787
	>70	0.67 (0.05-9.47)	0.765
Gender	Male (Reference category)	1.00	
	Female	0.38 (0.10-1.46)	0.157
Marital Status	Married (Reference category)	1.00	
	Single	2.40 (0.23-24.96)	0.464
	Widowed	0.90 (0.13-6.46)	0.917
	Divorced	0.60 (0.07-5.03)	0.638
Education	Lower than elementary school (Reference category)	1.00	
	Elementary school	-	
	Middle school	0.38 (0.02-6.35)	0.497
	Secondary school	2.63 (0.30-23.00)	0.383
	University	1.00 (0.16-6.26)	1.00
Employment	Post-grade	-	
	Employed (Reference category)	1.00	
	Un-employed	0.20 (0.04-1.04)	0.056
Income	Retired	1.20 (0.16-9.01)	0.859
	<5000 (Reference category)	1.00	
	5000-10000	0.94 (0.22-3.92)	0.930
DM	10000-15000	-	
	>15000	1.25 (0.09-17.65)	0.869
	Yes (Reference category)	1.00	
HTN	No	1.33 (0.35-5.03)	0.671
	Yes (Reference category)	1.00	
CVD	No	6.50 (0.72-58.89)	0.096
	Yes (Reference category)	1.00	
Years on dialysis	No	0.97 (0.23-4.17)	0.969
	0-1 year (Reference category)	1.00	
	1-5 years	1.50 (0.34-6.58)	0.591
Kt/v	5-10 years	3.00 (0.29-31.63)	0.361
	< 1.7 (Reference category)	1.00	
	>= 1.7	1.89 (0.48-7.49)	0.364

Table 4 showed that the mean QLI score of the respondents ranged from  $19.28 \pm 8.1$  to  $25.67 \pm 1.9$ . HFSUB, SOCSUB, PPSUB and FAMSUB have mean scores range from  $17.61 \pm 4.0$  to  $23.85 \pm 0.3$ ,  $16.94 \pm 0.0$  to  $27.00 \pm 2.3$ ,  $21.49 \pm 6.5$  to  $27.68 \pm 2.4$ ,  $21.13 \pm 10.7$  to  $27.47 \pm 2.8$ , respectively. No statistically significant differences were found between socio-demographic characteristics and QLI and other subscales.

Table 5 illustrated quality-of-life score stratified by comorbidities and dialysis information. The mean QLI score ranged from  $19.47 \pm 4.6$  to  $23.65 \pm 4.0$ . HFSUB, SOCSUB, PPSUB, and FAMSUB mean scores ranged from  $17.61 \pm 4.0$  to  $21.80 \pm 4.6$ ,  $16.94 \pm 5.5$  to  $23.17 \pm 4.8$ ,  $22.52 \pm 6.2$  to  $27.41 \pm 2.0$ , and  $24.60 \pm 5.6$  to  $27.86 \pm 1.7$ , respectively. Analysis further revealed that diabetes showed statistically significant difference with HFSUB ( $p=0.046$ ) while cardiovascular disease showed statistically significant difference with PPSUB ( $p=0.001$ ).

### Predictors of better quality of life

Binary logistic regression analysis identified that there is no statistically significant association between patients' baseline characteristics and having higher quality of life score ( $p>0.05$ ), Table 6.

### DISCUSSION

End-stage renal disease is the final stage of CKD and is characterized by a noticeable decrease in renal function. Common treatment modalities for patients with ESRD are hemodialysis, peritoneal dialysis, and kidney transplant. Each method has benefits, drawbacks, and varying effects on patient QoL. Quality of life of patients who underwent peritoneal dialysis were investigated in the current study. Findings demonstrated relatively high QLI scores in four domains of life, indicating that respondents were relatively satisfied in four domains.

Our results showed that the majority of the participants were male and aged 51 to 70 years old. Similar findings were found in the study of Bakewell, Zhang and Al-Wakeel.<sup>38</sup> According to Carero,<sup>39</sup> the reason why the majority of kidney disease patients were male is because men's kidney function may decline faster than women's, which may affect HRQOL negatively. Another important finding is that the majority of the participants were unemployed. According to previous studies, even among ESRD patients who receive successful transplantation, unemployment is high.<sup>40</sup>

This study found that the QLI score was  $21.80 \pm 4.4$  out of 30 (72.7%), reflecting a good quality of life. These results are consistent with those

of previous studies. An earlier investigation in Riyadh found similar scores to our results for the QoL of PD patients.<sup>35</sup> In Palestine, a prior study reported that the QoL of PD patients was very good.<sup>1</sup> For patients with ESRD, PD is an effective treatment option that contributes to many positive outcomes for patients such as reducing fatigue resulting from symptoms of the disease, providing freedom, independence, and flexibility, and improving survival rates, all of which may ultimately lead to a good or excellent QoL for patients.<sup>18-21, 41, 42</sup>

Although PD is an effective treatment for ESRD patients, patients on dialysis may encounter diminished HRQOL and a decline in daily living and social activities,<sup>43</sup> which confirms our result that QLI is correlated with HFSUB significantly ( $p < 0.001$ ). The results of our study show that the lowest subscale score was in the health and function domain. In line with this finding, a previous study among PD patients in Hong Kong found that the lowest QoL subscale score was for the health and function subscale.<sup>44</sup> Many factors, including ESRD, comorbidities, and PD complications, could be responsible for these findings.<sup>45-47</sup>

Low health scores in PD patients may be due to inadequate dialysis, low albumin, and anemia.<sup>48-50</sup> Patients undergoing PD are at increased risk of infection due to the nature of PD, which affects their ability to perform various life activities.<sup>51</sup> Studies have found that the disease and survival of patients receiving renal replacement therapy are most affected by comorbidities.<sup>45, 47</sup> In addition, factors that affect the HRQOL of these patients also include alexithymia, depression, and anxiety.<sup>52</sup> These findings highlight the need to consider these factors when treating and evaluating these patients.

Finally, functional impairment is common among PD individuals, as physical performance and physical activity are essential for participation in life.<sup>53, 54</sup> Increasing appropriate physical activity is crucial to improve patient outcomes.<sup>55, 56</sup> Implemented ongoing infection surveillance schedules and quality advancement programs can ease PD-associated infection.<sup>57</sup> Inducting a high-quality and practical strategy for PD may also help improve outcomes.<sup>42</sup>

The current study explored the association between socio-demographic characteristics and QoL. Nevertheless, no associations were seen between the socio-demographic and QIL and other subscales. In line with our findings, an earlier investigation in Brazil demonstrated no significant differences between QoL and socio-demographic characteristics of PD patients.<sup>58</sup> In Spain, between patients undergoing automatic PD and those undergoing continuous PD, a study found no statistically significant differences in any of the socio-demographic variables studied,<sup>52</sup> indicating the homogeneity of the socio-demographic profile of these patients. In contrast to these findings, Theofilou's investigation revealed that education affected the environmental domain of QoL, age impacted the physical and social domains, and marital status influenced the psychosocial domains.<sup>38</sup> These results underscore the intricate relationship between QoL and socio-demographic characteristics of PD patients; other factors, such as social support<sup>59</sup> and culture,<sup>60</sup> may influence QoL more than socio-demographic factors, and sometimes socio-demographic factors are homogeneous. Thus, when treating PD patients, all potential aspects should be accounted for to maintain an optimal QoL for these patients.

Another important finding is that diabetes showed a statistically significant difference with HFSUB ( $p = 0.046$ ). Consistent with our findings, a previous study compared health and physical function scores in diabetic controls, non-diabetic dialysis controls, and diabetic dialysis patients and found that scores were significantly lower in diabetic dialysis patients.<sup>61</sup> These results may be explained by the fact that diabetes is the leading cause of ESRD in many countries.<sup>62</sup> Dialysis patients with diabetes can be challenging to manage due to

metabolic factors, accelerated vascular calcification, and a higher rate of cardiovascular events and mortality in diabetic dialysis patients.<sup>62</sup> In addition, several prior investigations have discovered that diabetic patients with CVD have poor survival rates compared to patients without both diseases.<sup>63-66</sup> Diabetes is associated with many complications that may increase the rate of hospital admissions and hospital stays,<sup>67, 68</sup> leading to poor QoL for patients.<sup>38</sup> QoL for diabetic patients may also be affected by fatigue, which is common among patients.<sup>69</sup> Physical function, QoL, and outcomes for diabetes patients can be improved through the implementation of "kidney schools" and "diabetes schools," which are effective in increasing patients' awareness and understanding of self-care and treatment.<sup>61</sup>

On the other hand, in this study, CVD showed a statistically significant difference with PPSUB ( $p = 0.001$ ). These findings are in accord with the results of many studies. The primary reason for death and morbidity among patients with ESRD is CVD.<sup>70</sup> Studies have revealed that patient beliefs, values, and preferences play a substantial role in patient QoL, which establishes our finding that QLI is likened to PPSUB significantly ( $p < 0.001$ ). Religious aspects of spirituality are reported to have a significant and clinically relevant impact on HRQOL in patients with CKD, especially in those with advanced CKD.<sup>71</sup> Therefore, managing this aspect is essential to enhance patient outcomes. Research has demonstrated that addressing the psychological and spiritual aspects of CVD patients improves patient QoL and health significantly,<sup>72, 73</sup> in addition to other positive effects such as increased life expectancy and decreased stress, anxiety, and pain.<sup>73</sup>

This study discovered that QLI was also significantly correlated with SOCSUB and FAMSUB ( $p < 0.001$ ). This finding is consistent with previous studies in Riyadh,<sup>35</sup> Bahrain,<sup>41</sup> and South Africa,<sup>74</sup> which found that the QLI was also significantly associated with these subscales. PD may lead to poor QoL for patients with ESRD due to significant social, economic, psychological, and physical stress on the patients.<sup>75</sup> High satisfaction in the family subscale is explained by Ferrans<sup>76</sup> which could be associated with the fact that when the dialysis of the patient begins, help and support will be required from family and friends. Renal failure, which necessitates dialysis, requires adjustments in schedules, transportation, and dietary and lifestyle changes. If the dialysis patient is to adapt to their new lifestyle, family assistance is essential. In addition, social support is associated with better QoL for patients,<sup>59</sup> especially resource and family support.<sup>77, 78</sup> Therefore, healthcare providers' awareness of the importance of social and family support for these patients when developing a treatment strategy may aid in improving their QoL.

This study may have limitations. One limitation is that this study had a small sample size ( $n = 37$ ) and came from a single center. As a result, the findings cannot generalize the peritoneal dialysis population. One suggestion would be to carry out the research in other groups of patients from different centers who are receiving different treatments for ESRD. Because this topic has limited studies, the results are expected to contribute significantly to future research. A longitudinal study might offer useful details about how patients respond to PD.

## CONCLUSION

**This cross-sectional study investigated the quality of Life of peritoneal dialysis patients. Patients showed a relatively high QoL scores as well as four subscale scores. The study found out that patients were satisfied with their family subscale while they were least satisfied with their health and functional subscale. Furthermore, the study revealed that comorbidities such as diabetes and cardiovascular disease could impact the patients'**

**health and functional subscale and psychological/spiritual subscale respectively. Overall, peritoneal dialysis patients in this study have a relatively good QoL.**

**Author Contributions:** A.A supervised this study in term of methodology, statistical analysis and rafting. All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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**Ethics Approval and Consent to Participate:** The ethical standards formed by the institutional and national research committees, the 1964 Helsinki Declaration and its associated regulations, or comparable ethical principles were followed in this cross-sectional study that involved human subjects. The Human Investigation Committee (IRB) of King Fahad Medical City approved this study, having approval: 00010471, Log Number 22-286. All study participants provided online and verbal consent before agreeing to participate.

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