Original Article

# Comparison of health related quality of life between end-stage renal disease patients on haemodialysis and continuous ambulatory peritoneal dialysis

**Chowdhury TA[a*], Billah MM[b*] Ananna MA[b], Rahim MA[b], Iqbal S[c]**


## ABSTRACT

***Background:*** *Patients with end-stage renal disease (ESRD) require dialysis for their survival. Haemodialysis (HD) and continuous ambulatory peritoneal dialysis (CAPD) are two different modes of dialysis which can lead to multitude of stressful physical, mental and social problems. This study was done to evaluate the health related quality of life (HRQOL) of ESRD patients undergoing HD and CAPD.*

***Methods:*** *This cross-sectional analytical study was conducted in the Department of Nephrology, BIRDEM General Hospital, Dhaka during January 2019 to June 2020. A total of 66 ESRD patients undergoing HD or CAPD were taken after obtaining informed written consent. Information on socio-demographic characteristics, clinical features and laboratory investigations were assessed. HRQOL was assessed by using the validated Bengali version of Kidney Disease Quality of Life Short Form Tool (KDQOL-SF-36 version1.3). A semi-structured questionnaire was used for data collection and analysis was done by Statistical Package for Social Science (SPSS) version 24.0.*

***Results:*** *Majority of ESRD patients underwent HD (54.5%). Age was significantly associated with dialysis treatment modality (HD vs CAPD: 55.6±11.9 vs 62.9±11.9 years, $p<0.05$). According to SF-36 and KDQOL-SF 1.3 assessment, patient undergoing CAPD had a better QOL and mental health compared to HD. Among SF-36 domain, physical functioning had a significant positive relation with haemoglobin level ($r=0.320$, $p=0.009$). Haemoglobin level was positively correlated with symptoms, effects of kidney disease and burden of kidney disease in KDQOL-SF 1.3 scores ($p<0.05$).*

***Conclusion:*** *CAPD patients demonstrated a better QOL compared to HD patients.*


***Key words:*** *End-stage renal disease, haemodialysis, continuous ambulatory peritoneal dialysis, quality of life.*

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## INTRODUCTION

The prevalence of chronic kidney disease (CKD) is increasing and it is a global health problem which adds significantly to the cost of public health care.[1] The rising global epidemic of CKD resulting in end-stage renal disease (ESRD) is a big challenge for many developing countries.[2] Patients with ESRD require dialysis for their survival. Haemodialysis (HD) and continuous ambulatory peritoneal dialysis (CAPD) are two different modes of dialysis. Patients on HD need to go dialysis

**Author information**

a. Tufayel Ahmed Chowdhury, Assistant Professor, Department of Nephrology, BIRDEM General Hospital, Dhaka, Bangladesh.

b. Md. Mostarshid Billah, Mehruba Alam Ananna, Muhammad Abdur Rahim, Associate Professor, Department of Nephrology, BIRDEM General Hospital, Dhaka, Bangladesh.

c. Sarwar Iqbal, Professor and Former Head, Department of Nephrology, BIRDEM General Hospital, Dhaka, Bangladesh.

*The first two authors had equal contributions and will be considered as first authors.

**Address of correspondence:** Tufayel Ahmed Chowdhury, Assistant Professor, Department of Nephrology, BIRDEM General Hospital, Dhaka, Bangladesh. Email: dr_topu11@yahoo.com

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centers two or three times per week for four hours per session. This may influence their activity of daily life. On the other hand, CAPD can be done at home, at work place by patients themselves or by caregivers. This is an added burden for them who already faced a multitude of stressful physical, mental and social problems and feel anxiety and uncertainty towards their future. Although no consensus exists between experts in defining the quality of life (QOL), there is a general agreement that it is a multidimensional concept consisting of tangible and intangible elements. Most commonly, it is considered to include aspects such as life satisfaction, physical health, social health, hopefulness and behavioral and mental health.[3,4]

The CHOICE study, one of the most prominent studies on QOL in dialysis patients, showed that CAPD patients reported better scores in aspects such as bodily pain, physical functioning and emotional role functioning while HD patients reported a better outcome in vitality aspect of QOL.[5] A recent study in Kuwait showed CAPD patients had higher mean scores in all domains except mental health.[6] Another study done in Turkey revealed CAPD patients had better scores in emotional role, work status, cognitive function, dialysis staff encouragement and patient satisfaction domain.[7] Study done in Bangladesh by Nath PK et al. showed quality of life parameters were good among patients on CAPD.[8]

The Kidney Disease Quality of Life Short Form (KDQOL-SF 36) is an important tool for evaluation of QOL of dialysis patients. It consists of 43 items on kidney disease targeted domains such as symptoms/problems, effect of kidney disease, burden of kidney disease, work status, cognitive function, quality of social interaction, sexual function, sleep, social support, dialysis staff encouragement and patient satisfaction. It also has 36 items on general health related domains such as physical functioning, physical role limitation, bodily pain, general health, emotional well-being, social functioning, emotional role limitation and energy/fatigue. All scale scores range from 0-100, where higher scores indicate a better QOL.[9] This study aims to compare QOL of patients on HD and CAPD using KDQOL-SF 36 version 1.3.

## METHODS

This cross-sectional analytical study was conducted in the Department of Nephrology, BIRDEM General Hospital, Dhaka, from January 2019 to June 2020. The study included 66 ESRD patients undergoing HD or CAPD. Patients aged over 18 years who had been on HD or CAPD for at least three months, without a change in treatment modality, during that time and who provided informed written consent were included. Patients with acute kidney injury, psychosis or cognitive dysfunction were excluded.

Ethical clearance was obtained from the hospital's ethical review committee. Data were collected using convenient sampling, including socio-demographic variables and laboratory investigations such as blood counts, lipid profile, serum creatinine and electrolytes. Health-related quality of life (HRQOL) was assessed by using the validated Bengali version of the KDQOL-SF-36 tool.[10] Scores were transformed into a 0-100 range with higher scores indicating better QOL.[9]

Data analysis was performed by using SPSS version 24. Descriptive statistics were used and differences in baseline characteristics were analyzed by using the t-test for continuous variables and the Chi-square test for categorical variables. Pearson correlation was used to assess the association between haemoglobin levels and HRQOL domains, with statistical significance set at $p<0.05$.

## RESULTS

Total patients were 66 (36 on HD and 30 on CAPD group), males were 30 and females were 36. Mean age of the patients was 55.61±11.89 years in HD patients and 62.87±11.89 years in CAPD patients. Most (61.1%) HD patients were between 41-60 years age group, however, majority (60%) of CAPD patients were in 61-80 years age group.

The mean dialysis sessions of HD patients were 2.58±0.5 per week, mean CAPD exchange was 2.90 ±0.61 per day. Only 1 respondent had peritonitis as CAPD related complication and other 1 had exit site infection. CAPD was given mostly by single person (60%).

Total white blood cell count, blood urea, total protein, serum creatinine, triglyceride and low density lipoprotein (LDL) were significantly higher in CAPD group (Table I). Serum potassium level was significantly higher in HD patients. HD patients had more hospital admissions than CAPD [27 (75%) vs 10 (33.3%)] in last 6 months. Others were shown in Table II.

**Table I.** Investigation profile among HD and CAPD (N=66)

| Investigation | HD (mean±SD) | CAPD (mean±SD) | p value* |
|---|---|---|---|
| Haemoglobin(Hb) (gm/dl) | 10.13±0.84 | 10.34±0.87 | 0.320 |
| Total WBC count(/µL) | 8341.39±2069.38 | 9188.80±1249.26 | 0.045 |
| Blood urea (mg/dl) | 64.50±9.27 | 102.87±15.43 | <0.001 |
| S. Creatinine(mg/dl) | 5.06±0.48 | 6.80±1.29 | <0.001 |
| Total protein(g/dl) | 64.28±3.88 | 66.89±3.17 | 0.004 |
| S. Albumin(g/l) | 29.84±3.30 | 29.32±3.17 | 0.523 |
| S. Iron(µg/dl) | 11.43±3.29 | 10.68±1.67 | 0.262 |
| S. Ferritin(µg/dl) | 297.97±126.54 | 297.70±162.75 | 0.262 |
| TIBC(µg/dl) | 28.50±2.13 | 28.48±2.65 | 0.978 |
| HbA1c (%) | 7.28±0.77 | 7.53±1.08 | 0.307 |
| Total cholesterol(mg/dl) | 214.64±40.75 | 212.0±37.05 | 0.786 |
| Triglyceride(mg/dl) | 173.83±32.35 | 227.3±52.98 | <0.001 |
| HDL (mg/dl) | 36.71±4.58 | 36.33±4.19 | 0.735 |
| LDL (mg/dl) | 123.31±15.50 | 143.43±17.85 | <0.001 |
| S. Na+ (mmol/L) | 136.22±3.48 | 136.93±2.89 | 0.377 |
| S. K+ (mmol/L) | 4.31±0.42 | 3.64±0.25 | <0.001 |
| S. Cl- (mmol/L) | 103.87±5.36 | 102.31±4.35 | 0.219 |
| S. HCO3-(mmol/L) | 22.38±1.57 | 21.96±1.40 | 0.275 |

*Student t- test was done.

**Table II.** History of hospital visits among HD and CAPD (N=66)

| Variable | HD (n=36) n(%) | CAPD (n=30) n(%) | p value* |
|---|---|---|---|
| Number of patients admitted in hospital in last 6 months | 27(75) | 10 (33.3) | 0.001 |
| Duration of hospital stay in last 6 months (days) | 9.14±11.67 | 3.70±9.52 | 0.045 |
| Total hospital visits in last 6 months (without getting admitted) | 47.0±29.44 | 1.20±1.88 | <0.001 |

*Chi-square test, *Mann Whitney U test and ***Student t- test was done.

Table III showed comparison of overall and mean scores between HD and CAPD patients for eight domains from the SF-36 questionnaire. According to SF-36 questionnaire assessments, physical functioning, physical role limitation, body pain, emotional role limitation, vitality and mental health were higher among CAPD respondents, with significant association with emotional role limitation and vitality. General health and social functioning were higher in HD patients. Overall health quality was better in CAPD respondents.

Table IV showed comparison of mean physical component summary (PCS) and mental component summary (MCS) scores of CAPD and HD. Mental component summary was significantly higher in CAPD group (41.98±13.62 vs. 12.39±2.07, p=0.025) than HD respondents. While, physical component summary was similar in both groups.

**Table III.** Comparison of overall and mean scores between HD and PD patients for eight domains from the SF–36 questionnaire (N= 66)

| Domain | HD (mean±SD) | CAPD (mean±SD) | p value* |
|---|---|---|---|
| Physical functioning | 26.67±16.08 | 31.50±20.81 | 0.291 |
| Physical role limitation | 88.89±16.31 | 92.50±13.37 | 0.335 |
| Body pain | 43.40±17.68 | 44.67±22.66 | 0.800 |
| General health | 34.58±14.01 | 30.0±15.37 | 0.210 |
| Social functioning | 45.48±20.078 | 35.0±20.60 | 0.050 |
| Emotional role limitation | 40.67±15.43 | 58.93±17.67 | <0.001 |
| Vitality | 34.72±17.32 | 54.0±19.71 | <0.001 |
| Mental health | 17.59±21.80 | 20.0±18.77 | 0.636 |
| Overall | 41.50±9.32 | 45.83±11.93 | 0.112 |

*Student t- test was done

**Table IV.** Comparison of mean PCS and MCS scores of the SF–36 questionnaire between HD and CAPD patients (N=66)

| Variable | HD (mean±SD) | CAPD (mean±SD) | p value* |
|---|---|---|---|
| Physical component summary (PCS) | 48.39±9.39 | 49.67±11.68 | 0.623 |
| Mental component summary (MCS) | 12.39±2.07 | 41.98±13.62 | 0.025 |

*Student t- test was done

Table V showed comparison of overall and mean scores between HD and CAPD patients. Maximum domains had yielded the best results with statistical significance in CAPD patients compared to HD: symptoms (72.01±9.47 vs. 66.89±8.36, p=0.023), effects of kidney disease (75.42±13.58 vs. 53.04±13.14, p<0.001), burden of kidney disease (30.63±15.77 vs. 14.93±13.38, p<0.001), sleep (58.83±11.18 vs. 50.90±12.51, p=0.008), social support (93.89±16.07 vs. 53.24±26.07, p<0.001) and patients satisfaction (61.67±21.95 vs. 50.93±14.34, p=0.020). Quality of social interaction were better in HD (55.56±9.95 vs. 14.93±13.38, p<0.001) respondents.

Table VI showed correlation of SF-36 scores with haemoglobin, serum albumin and serum creatinine. Among SF-36 domains, physical functioning had a significant positive relation with haemoglobin (r=0.320, p=0.009) and emotional role limitation had a significant positive correlation with serum creatinine (r=0.306, p=0.012).

**Table V.** Comparison of overall and mean scores between HD and CAPD patients KDQOL-SF 1.3 scores of the ESRD-targeted areas (N= 66)

| Domain | HD(mean±SD) | CAPD(mean±SD) | p value* |
|---|---|---|---|
| Symptom/problem list | 66.89±8.36 | 72.01±9.47 | 0.023 |
| Effects of kidney disease | 53.04±13.14 | 75.42±13.58 | <0.001 |
| Burden of kidney disease | 14.93±13.38 | 30.63±15.77 | <0.001 |
| Work status | 47.22±11.62 | 50.0±0 | 0.196 |
| Cognitive function | 54.81±19.53 | 56.0±18.90 | 0.804 |
| Quality of social interaction | 55.56±9.95 | 14.93±13.38 | <0.001 |
| Sexual function | 47.22±29.57 | 47.92±36.58 | 0.963 |
| Sleep | 50.90±12.51 | 58.83±11.18 | 0.008 |
| Social support | 53.24±26.07 | 93.89±16.07 | <0.001 |
| Dialysis staff encouragement | 65.63±16.47 | 61.25±17.48 | 0.300 |
| Patient satisfaction | 50.93±14.34 | 61.67±21.95 | 0.020 |

*Student t- test was done.

**Table VI.** Correlation of SF-36 scores with Hb%, s. albumin and s. creatinine (N=66)

| Domains | Hb% | | S. Albumin | | S. Creatinine | |
|---|---|---|---|---|---|---|
| | r value | p value | r value | p value | r value | p value |
| Physical functioning | 0.320 | 0.009 | 0.058 | 0.642 | -0.001 | 0.996 |
| Physical role limitation | -0.011 | 0.930 | -0.075 | 0.549 | -0.005 | 0.965 |
| Body pain | 0.178 | 0.153 | 0.032 | 0.796 | 0.022 | 0.859 |
| General health | 0.241 | 0.052 | 0.006 | 0.961 | 0.019 | 0.880 |
| Social functioning | 0.092 | 0.456 | 0.007 | 0.956 | -0.087 | 0.487 |
| Emotional role limitation | 0.176 | 0.157 | -0.081 | 0.518 | 0.306 | 0.012 |
| Vitality | 0.226 | 0.068 | -0.003 | 0.984 | 0.254 | 0.039 |
| Mental health | -0.215 | 0.083 | -0.128 | 0.304 | 0.164 | 0.188 |
| Overall | 0.215 | 0.083 | -0.039 | 0.755 | 0.152 | 0.222 |

Pearson correlation test was done. r=correlation coefficient

Relation between haemoglobin level with total of PCS and MCS of SF-36 are illustrated in Figure 1 and 2 respectively. There was significant positive relation between haemoglobin with total PCS by SF-36 questionnaire (r=0.307, p=0.012).

Correlation of KDQOL-SF 1.3 scores of the ESRD-targeted areas with haemoglobin is presented in Table VII. Among KDQOL-SF 1.3 scores of the ESRD-targeted areas, symptoms, effects of kidney disease and burden of kidney disease had significant positive relation with haemoglobin.

**Table VII.** Correlation of KDQOL-SF 1.3 scores of the ESRD-targeted areas with Hb (N=66)

| Domains | r value | p value |
|---|---|---|
| Symptom/problem list | 0.281 | 0.022 |
| Effects of kidney disease | 0.285 | 0.020 |
| Burden of kidney disease | 0.287 | 0.019 |
| Work status | -0.100 | 0.425 |
| Cognitive function | 0.120 | 0.338 |
| Quality of social interaction | 0.136 | 0.277 |
| Sexual function | 0.237 | 0.266 |
| Sleep | 0.057 | 0.679 |
| Social support | 0.111 | 0.375 |
| Dialysis staff encouragement | -0.185 | 0.137 |
| Patient satisfaction | -0.076 | 0.544 |

Pearson correlation test was done. r=correlation coefficient

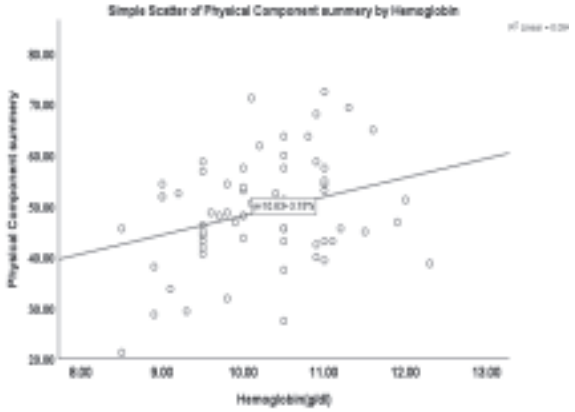


**Figure 1.** Scattered plot diagram showing relation between hemoglobin level with total physical component summery of SF-36 (N=66)

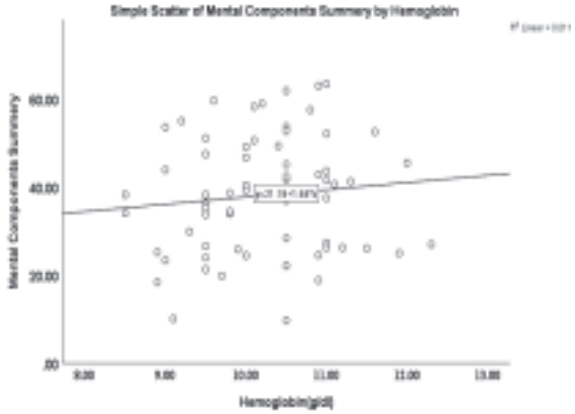


**Figure 2.** Scattered plot diagram showing relation between hemoglobin level with total mental component summery of SF-36 (N=66)

## DISCUSSION

ESRD continues to be a serious challenge for many developing countries and HD and CAPD are the two common forms of dialysis therapy essential for ESRD patients.[11] According to this study, significant association was found between age and the type of dialysis used among respondents. Vikas Makkar et al., found the mean age of patients undergoing CAPD was 52.7± 13.1 compared to 49.4±15.9 in HD patients.[12] There was no statistical significance of socio-demographic condition with HD and CAPD. Females (58.3%) were slightly higher among HD group, though, among CAPD group both male and female were equal. There were two PD related complications found in this study which was in line with study by Mau et al.[13]

According to investigation results among respondents total white cell count, blood urea level, total protein, serum creatinine, urine volume, triglyceride, LDL were significantly higher in CAPD group. Nevertheless, serum potassium level was significantly higher in HD patients. However, in the study of Chu-Chun Hsu et al., significant differences in creatinine, haemoglobin and albumin levels were found ($p<0.001$, 0.014, and <0.001, respectively) between HD and CAPD patients.[14] In last 6 months, respondents with HD (n=27, 75%) had stayed in hospital significantly more than CAPD (n=10, 33.3%) respondents (10.56±11.77 vs. 3.87±9.47 days, $p<0.05$), as well as total visits at hospital (without getting admitted) was higher among HD compared to CAPD patients. Zhang et al. reported that HD patients had higher hospitalization rates compared to CAPD patients and hospitalized patients had worse QOL than non-hospitalized patients.[15]

According to SF-36 questionnaire assessments, physical functioning, physical role limitation, body pain, emotional role limitation, vitality and mental health were higher among CAPD respondents, with significant association with emotional role limitation and vitality. Yet, general health and social functioning were higher in HD patients. Mau et al., revealed that CAPD patients had higher bodily pain scores than HD patients, while HD patients had higher social functioning scores than CAPD patients ($p<0.05$).[13] Overall health quality was better in CAPD respondents compared to HD patients. These findings lined with Chuasuwan et al., as patients with CKD stage 5 or ESRD treated with CAPD had better generic HRQOL measured by SF-36 in his study.[16]

Quality of dialysis has a positive effect on the life expectancy of dialysis patients and their QOL. In the study by Atapour et al., there was a significant difference between the two groups when it comes to physical category of QOL but in emotional aspects there was no significant difference between the two groups.[17] On the other hand, in this study MCS was significantly higher in CAPD group (41.98±13.62 vs. 12.39±2.07, $p=0.025$) than HD respondents, while, PCS was quiet similar in both groups. That might be because of patients who opt for CAPD usually have a better social support system.

Maximum domains had yielded the best results and with statistical significance in CAPD patients compared to HD patients, though, quality of social interaction were better in HD respondents. Similarly, in study by Turk et al., all domains of KDQOL-SF 1.3 scores were almost equal or higher in CAPD patients compared to HD, yet work status, cognitive function, dialysis stuff and patients' satisfaction were significantly higher in CAPD patients.[7]

Among SF-36 domain, physical functioning had significant positive relation with haemoglobin and mean value of emotional role limitation had significant positive correlation with serum creatinine which was quite similar study, that detected positive correlations between serum haemoglobin levels, albumin and some subgroups of KDQOL-SF 1.3 scale.[7] Also, in another study of Ýzbirak et al., there was a moderate positive correlation between albumin levels and physical function, negative correlation between phosphorus levels and mental health status and a negative correlation between potassium levels and general health status of CAPD patients.[18] This study showed overall health quality was better among CAPD groups and also mental health component was significantly higher in CAPD patients.

### Limitations

This was a single center study with small sample size. Duration of patients on CAPD and HD was not compared. However, further larger multicenter studies with larger sample size are recommended.

### Conclusion

In the current study, patients undergoing CAPD modality demonstrated a better QOL compared to HD patients and laboratory parameter such as haemoglobin

level played a vital role in the patient's mean value of physical functioning, symptoms, effect and burden of kidney disease. Hence, a more extensive use of the concept of QOL and patient-reported scales will guide achieving the best medical intervention, patient satisfaction and subsequently, improve QOL.

**Authors' contribution:** TAC, MMB and SI planned the study. TAC collected data, analysed data, drafted manuscript. MMB also helped in draft preparation. MAR and MAA revised the manuscript. All authors read and approved the final version for publication.

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**Conflicts of interest:** Nothing to declare.

## REFERENCES

1. National Kidney Foundation. K/DOQI clinical practice guidelines for chronic kidney disease: evaluation, classification, and stratification. Am J Kidney Dis 2002;39(1):1-266.
2. Okpechi IG, Nthite T, Swanepoel CR. Health-related quality of life in patients on hemodialysis and peritoneal dialysis. Saudi J Kidney Dis Transplant 2013;24(3):519.
3. Liem YS, Bosch JL, Arends LR, Heijenbrok-Kal MH, Hunink MG. Quality of life assessed with the Medical Outcomes Study Short Form 36-Item Health Survey of patients on renal replacement therapy: a systematic review and meta-analysis. Value Heal 2007;10(5):390–7.
4. Croog SH, Levine S. Quality of life and health care interventions. In: Freeman H, Levine S, editors. Handbook of Medical Sociology. 4th ed. Englewood Cliffs: Prentice Hall New Jersey; 1989. *pp* 508–28.
5. Powe NR, Klag MJ, Sadler JH, Anderson GF, Bass EB, Briggs WA et al. Choices for healthy outcomes in caring for end stage renal disease. Seminars in dialysis. 1996;9(1):9-11.
6. Albatineh AN. Quality of Life Comparison between Hemodialysis and Peritoneal Dialysis among End-Stage Renal Disease Patients in Kuwait. Open Access J Transl Med Res 2017;1(3):61–7.
7. Ýpek T, Kenan A, Bilyikli Z. Quality of life and associated factors in hemodialysis and peritoneal dialysis patients. Cukurova Med J 2020;45(1):79–88.
8. Nath PK, Iqbal MM, Iqbal S, Alam KS, Anwar MR, Chowdhury MF et al. Health related quality of life in patients receiving continuous ambulatory peritoneal dialysis. Mugda Med Coll J 2022; 5:14–8.
9. Hays RD, Kallich JD, Mapes DL, Coons SJ, Amin N, Carter WB, et al. Kidney Disease Quality of Life Short Form (KDQOL-SF), version 1.3: a manual for use and scoring. Santa Monica, CA: Rand Corp; 1997.
10. Saha SK, Masur MA, Choudhury SR, Khan MA, Iqbal M, Choudhury AA, et al. Quality of Life of Patients on Maintenance Hemodialysis in Relation to Hemoglobin Level: A Multicenter Study from a Developing Country. BIRDEM Med J 2017;7(3):198–204.
11. Zazzeroni L, Pasquinelli G, Nanni E, Cremonini V, Rubbi I. Comparison of Quality of Life in Patients Undergoing Hemodialysis and Peritoneal Dialysis: A Systematic Review and Meta-Analysis. Kidney Blood Press Res 2017; 42(4):717–27.
12. Makkar V, Kumar M, Mahajan R, Khaira NS. Comparison of outcomes and quality of life between hemodialysis and peritoneal dialysis patients in indian ESRD population. J Clin Diagnostic Res 2015;9(3):28–31.
13. Mau LW, Chiu HC, Chang PY, Hwang SC, Hwang SJ. Health-related quality of life Taiwanese dialysis patients: Effects of dialysis modality. Kaohsiung J Med Sci 2008;24(9):453–60.
14. Hsu CC, Huang CC, Chang YC, Chen JS, Tsai WC, Wang KY. A comparison of quality of life between patients treated with different dialysis modalities in Taiwan. PLoS One 2020;15(1):1–11.
15. Zhang AH, Cheng LT, Zhu N, Sun LH, Wang T. Comparison of quality of life and causes of hospitalization between hemodialysis and peritoneal dialysis patients in China. Health Qual Life Outcomes 2007;5(49):1–6.
16. Chuasuwan A, Pooripussarakul S, Thakkinstian A, Ingsathit A, Ingsathit A, et al. Comparisons of quality of life between patients underwent peritoneal dialysis and hemodialysis: A systematic review and meta-analysis. Health and Quality of Life Outcomes 2020; 18: 1–11.
17. Atapour A, Nasr S, Boroujeni AM, Taheri D, Dolatkhah S. A comparison of the quality of life of the patients undergoing hemodialysis versus peritoneal dialysis and its correlation to the quality of dialysis. Saudi J kidney Dis Transplant 2016;27(2):270–80.
18. Izbirak G, Akan H, Mistik S, Gündoçdu B, Uslu Ü, Çobanoçlu M. Comparison of health-related quality of life of patients on hemodialysis and continuous ambulatory peritoneal dialysis. Turkiye Klin J Med Sci 2010;30(5):1595–602.