

ORIGINAL ARTICLE

Quality of Life and Its Determinants of Demographic Characteristics Among Chronic Renal Failure Patients Who Underwent Therapy of Hemodialysis in Arifin Ahmad Public Hospital, in Pekanbaru Riau Indonesia

Sofiana Nurchayati¹, Tukimin bin Sansuwito², Hafizah Che Hasan²

¹ Nursing Faculty, University of Riau Kampus Bina Widya KM. 12,5, Simpang Baru, Kec. Tampan, Kota Pekanbaru, Riau 28293, Indonesia

² Lincoln University College, Wisma Lincoln, No, 12-18, Jalan SS 6/12, 47301 Petaling Jaya, Selangor Malaysia

ABSTRACT

Introduction: Chronic Renal Failure (CRF) is an irreversible chronic kidney disease requires long term of care included hemodialysis (HD) therapy which significantly affects patients' quality of life (Qol). The aim of this study was to examine association between sociodemographic factors and quality of life among patients with CRF. **Methods:** A cross-sectional study design was used to carry out this study in which data was collected from 30 CRF patients who undergoing HD by using a validated instrument of WHOQoL-Bref-26 items. **Results:** Descriptive analysis has found that research participant in this study was dominated by female (67%), age group 51 to 60 years old (43%), unemployed (60%) and majority of them were live with good quality of life level(53.3%). Meanwhile inferential analysis shown that Qol among HD patients were influenced by their age ($p=0.01$), gender ($p=0.03$) and don't have association with occupation status ($p=0.07$). **Conclusion:** Hemodialysis patients in Arifin Ahmad Hospital live with good level of Qol which influenced by variables of gender and age group. Recommended for nurses to give attention on domain of Qol especially physical function, provide psychosocial and environmental supports.

Keywords: Chronic renal failure, Demographic, Quality of life

Corresponding Author:

Sofiana Nurchayati, Master in Nursing
Email: sofiana.nurchayati@lecturer.unri.ac.id
Tel: +62 821-2371-0455

INTRODUCTION

Chronic renal disease is one of the most urinary diseases that recently become a serious public health concern throughout worldwide. It characterized by a high prevalence, mortality and costly disease. Recently, 13.4% global population reported suffer from the disease and 10.6% among them require renal replacement therapy or dialysis (1). Globally, in 2010 over than 2.3 million people with end stage renal failure was died due to poor access and vulnerable to dialysis therapies and the disease has killed 1.2 million international population in 2015 (2). A current study has reported that end stage kidney disease has affected 5.4 million

global population and projected will be tremendously increased to 14.5 million in 2030 (3). The disease has sucked a sum USD 100,000 for one hemodialysis patient per year. Asia was recognized as an epicenter of the disease prevalence where mortality rate in last 15 years in this region was 3.4% which associated to annual life lost 386 per100,000 Asian population particularly who life in middle income countries with low level of social economy(4).

Indonesia is one of the developing country in Southeast Asia where the chronic renal failure prevalence of was tremendously increased to the alarming rate in the nationwide. Accordingly, Indonesian Agency for Health Research and Development has reported that the prevalence of chronic renal failure among Indonesian population was 0.2% or 2 per 1000 population while prevalence of nephrolithiasis was 0.6% or 6 per 1000 population (5). The latest study in Southeast

Asian countries indicate prevalence of renal failure in Indonesia was increased to 7.5% with mortality rate was 1.82% (6). In detail, Indonesian Ministry of Health has found that prevalence of the disease was higher on man (0.3%) compared than women (0.2%). Based on the age category, the prevalence of the disease fluctuation begins at the age of 35 years old and the peak prevalence occurs on age 75 years old and above. Based on education background, prevalence of kidney failure was highest among people who don't have formal education background and prevalence of the disease is higher among rural population (0.3%) compared than urban population (0.2%) (7).

Chronic renal failure can be defined as an irreversible gradual loss of kidney function over than 3 months characterized by decrease threshold of glomerular filtration rate to $< 60\text{ml/min/1.73m}^2$ which estimated by using creatinine serum level, lead to scanty urine production, increase body fluid retention and albuminuria (8,9). The disease can be diagnosed by using a blood test to analyze estimated glomerular filtration rate (eGFR), urine test to check level of albumin creatinine ratio and protein urine. In addition, ultrasound scan, MRI scan or CT scan and biopsy also uses as supportive procedure for establishment of medical diagnosis. Accuracy of diagnostic is the main key steps to determine classification of CKD included stage 1 when $\text{eGFR} > 90/\text{min}$, stage 2 if $\text{eGFR} 60$ to 89ml/min with sign of kidney damage, stage 3 with eGFR of 30 to 59ml/min , stage 4 with eGFR in the range 15 to 29ml/min and stage 5 with eGFR below 15ml/min which indicate that kidney function almost fully lost (10). Indonesian Renal Registry has highlighted that the high prevalence end stage renal failure in Indonesia particularly caused by pyelonephritis (7%), obstructive nephropathy (7%), chronic glomerulonephritis (10%), diabetes mellitus (27%) and hypertensive nephrosclerosis (37%) (11). Accordingly, American Kidney Fund has report that the disease was present clinical manifestation such as itchiness, cramp of muscle, loss of appetite, nausea and vomit, oedema in feet and ankles, scanty urine, breathing and sleeping disorders. In some acute cases, patients also suffer from abdominal pain, back pain, diarrhoea, fever, nosebleeds and rash (12). In addition, ESRD patient also often suffer from complication such as body fluid retention (oedema), imbalance of electrolyte and acid-base, skeletal de mineralization, anaemia, hypertension, cardiovascular disease those adversely affect to clinical outcome and require renal replacement therapy (13).

Renal replacement therapy is a therapy to replace the function of kidney in filtering blood in preserving expected clinical outcome and improve quality of life. Haemodialysis was recognized as the most renal replacement therapy chose by patients to overcome body fluid retention and remove waste metabolism. It can be defined as a purifying process of the blood from

adverse toxin, excessive salt and retention of body fluid by using a dialysis machine (14). Accordingly, National Kidney Foundation has recommend nurses have to take care possibility complication related haemodialysis such as sudden drop blood pressure caused by rapid fluid removal, headache, nausea, vomit and fatigue (15). In Indonesia, dialysis therapy was first introduced in 1987 and currently this country has 358 haemodialysis unit with 2437 machine of haemodialysis across the nationwide. Accordingly, Indonesian Ministry of Health has reported that the number of renal failure patients who demand to haemodialysis was increase particularly on age group 45 to 64 years old (6). In addition, Indonesian Society of Nephrology has projected that there are 200,000 patients with end stage renal failure those need haemodialysis every year. This renal society also has reported that 82.4% CRF patients in the nationwide were prefer haemodialysis therapy and another 12.8% patients prefer continues ambulatory peritoneal dialysis therapy (16).

Arifin Ahmad hospital is a public hospital in Pekanbaru Riau where about 412 patients with end stage renal failure received haemodialysis therapy (17). Based on pre-research study in this hospital indicate that patients who undergoing haemodialysis were suffered from physical issues, psychological symptoms, some disease complications and disease co morbidities. In addition, the patients have to take long life haemodialysis, spent hundred thousand rupiahs for every haemodialysis therapy and other treatment expenditures, comply to self-lower protein diet, low sodium diet, restriction of fluid and change life style those increase burden individuals patient and their family. Patient who undergoing haemodialysis also often feel loss of freedom in their life, feel their life depend on machine, dependent to the health care provider and increase economic burden, loss of occupation, broken home, reduce productivity as well as social life those negatively impact to patients quality of life .

Quality of life was defined by WHO as a perception of individuals to their life position in relation with their life goal and expectation within their own social cultural context and values system (18). There is a body of literature growth to recognize quality of life as the most important outcome of care for populations with chronic renal failure. Another research justified that measurement outcome of care has to include general wellbeing, life functioning, life satisfaction and happiness those compressed within concepts of Quality of life (Qol) (19). There isa literature debate about dichotomous measurement of quality of life which disputed on objective and subjective Qol, quantitative and qualitative approach of Qol measurement. However, since psychometric was found, majority of researchers were quantified Qol measurement in their research. Accordingly, WHO has produced some quantitative Qol instrument such as WHO-Qol 100 items, WHO-

Qol Bref 26 items, followed by its generic instrument such as SF-36, SF-12, and EQol 5 items. This research was aimed to measure Qol and its sociodemographic factors among patients with chronic renal failure who undergoing hemodialysis therapy in Pekanbaru Riau Indonesia.

MATERIALS AND METHODS

A cross-sectional study design was used to carry out this research in which data collection done in one short point time (one week), measure current condition with baseline treatment provided by the hospital and without any interventions from researcher. Population in this research based on one month estimation is 109 chronic renal failure patients who undergoing hemodialysis therapy in Arifin Achmad Hospital Pekanbaru Riau. Inclusion criteria used to select research population included patients who undergoing regular hemodialysis two times a week, fully conscious and without mental illness. Furthermore, minimum sample size was used because of time visit constrain in which 30 participants were selected by using a simple random sampling technique. In order to measure Qol in this research, a validated WHO-Qol Bref 26 items was used. It is an abbreviation of the WHO-Qol 100 item with four domains included physical health, psychological health, social relationship and environment aspects of life. Scoring was done according to original guideline in which the original score was transform to 0 – 100. The outcome of this measure were categorized when the total score \geq median categorized as a good quality of life. Meanwhile, sociodemographic data was collected by using subsume questionnaire containing questions about participant age group, gender and occupation.

Ethical Clearance:

The study protocol was approved by the Ethics Committee of University of Riau Fakultas Keperawatan Faculty Of Nursing (ETHICAL Approval nomor: 129/UN.19.5.1.8/KEPK.FKp/2020) dated 15th August 2020.

RESULTS

Result of this research is presented in sequent variables included gender of participant, age group, occupation and quality of life those reported in the following table:

Table I: Gender of the participant

Gender	Frequency	Percent (%)
Male	10	33%
Female	20	67%
Total	30	100%

Frequency distribution table above has shown that 33% research participants were male and another 67% were female. It can be interpreted that participant in this research was dominated by female chronic renal failure patients.

Table II: Age Group of the participant

Age Group	Frequency	Percent (%)
20 – 30 years old	1	3
31 – 40 years old	1	3
41 – 50 years old	11	37
51 – 60 years old	13	43
61 – 70 years old	4	14
Total participant	30	100

Frequency table above has shown that 3% of research participants come from age group 20 to 20 years old, 3% age group 31 to 40 years old, 37% participant with age 41 to 50 years old, 43% was age 51 to 60 years old and 14% with age 61 to 70 years old. Based on those data, can be interpreted that majority of participant was dominated by hemodialysis patients with age group 61 to 70 years old.

Table III: Occupation of the participant

Occupation	Frequency	Percent (%)
Government Servant	1	3.3
House Wife	6	20
Private worker	5	16.7
Unemployed	18	60
Total	30	100

Table above shown that 3.3 % research participants were government servant, 20% house wife, 16.7% private workers and 60% unemployed patients. Based on those findings can be interpreted that majority of participant was unemployed patients.

Table IV: Quality of Life

Quality of Life	Frequency	Percent (%)
Good	16	53.3
Poor	14	46.7
Total	30	100

Based on the table finding above can be described that 53.3% patients with chronic renal failure who undergoing hemodialysis lives with a good level quality of life and another 46.7% was life with poor quality of life.

Bivariate analysis findings above can be interpreted by using coefficient correlation or and its p values. The significance of correlation among variables tested can be obtained when coefficient correlation values is higher or and p values lower than their critical value.

Accordingly, coefficient correlation between gender and quality of life is $0.369 > 0.361$ and p value is $0.01 < 0.05$ those indicate there is a significant relationship between gender and quality of life. Coefficient correlation between age group and Qol is $0.390 > 0.361$ and it p value is $0.03 < 0.05$ those indicate there is a significant relationship between age group and Qol. Coefficient correlation between occupation status and Qol is $0.350 < 0.361$ and it p value is $0.07 > 0.05$ those indicate that there is no significant relationship between occupation status and Qol.

Table V: Demographic Determinant of Qol

Determinant Factors	Indicators	Qol	Critical Value
Gender	r result	0.369	0.361 (r table)
	P value	0.01	0.05 (α value)
Age Group	r result	0.390	0.361 (r table)
	P value	0.03	0.05 (α value)
Occupation	r result	0.350	0.361 (r table)
	P value	0.07	0.05 (α value)

DISCUSSION

This research has found that majority of research participants were dominated by female chronic renal failure patients. This was a gender bias in prevalence of chronic renal failure in which the nature of disease prevalence was higher on male than female caused by faster decline of renal functions on male than female (20). A previous study in 2019 found that prevalence of end stage renal failure dominated by man (62%) and another 38% is women (21). Inversely, in 2017 Indonesian Renal Registry has reported that new case chronic renal failure in Indonesia was higher among male patient (56%) than female (44%) (20). Previous study has explained that women look like protected from developing renal failure during the reproductive ages and the risk of disease begins to rise 10 years later in women than in men (22). Decision to get hemodialysis therapy influenced by health status of chronic renal failure patients (20). Existing publish research shown that male patients tend to get dialysis therapy earlier and male patients have poorer survival rate compared than female (23). Evidence in another study shown that there is no gender difference mortality rate among patients who underwent hemodialysis but mortality rate patients without hemodialysis were higher on men than women (20). However, a finding of existing study has proclaimed that prevalence of chronic renal failure in lower and middle income countries in Southeast Asia such as Indonesia commonly higher among female than male (24). This evidence supported by previous study finding that number of pre-dialysis patients was higher among female than male (20).

Statistical evidence has shown that participant in this study was dominated by age group 51 to 60 years old. This phenomenon indicates that prevalence of chronic renal failure in Indonesia clearly influenced by aging process. Accordingly, Centers for Disease Control and Prevention has highlighted that age is one of the important risk factor influence prevalence of chronic renal failure in which the filtration function of nephron in kidney gradually decreased 1% every year since age 40 years old and above (25). Previous study also found that prevalence of chronic renal failure was higher among older age group of the population(24) because of renal function deteriorates by aging that lead to GFR decline(22). Another study was justify that prevalence of chronic renal failure was influenced by aging in which the older people have higher risk to get the disease. The study has highlighted that prevalence of ESRD was also influenced by aging process in which the highest prevalence of stages 3 to 5 of chronic renal failure was population with eldest age group(1). Finally, the proportion of patients with chronic renal failure on conservative care was increases sharply at age between 50 to 60 years old(20).

This research has shown that patients with chronic renal failure have various types of occupation included as government servant 3.3%, house wife 20%, and private worker 16.7%, unemployed 60%. In conjunction with risk of chronic renal failure, there are some occupation were related to risk of chronic renal failure particularly for people who in a construction works, agriculture, hospitals and servants or household cleaners those believed got exposure of nephrotoxin particles (26). Existing empirical evidence shown that prevalence of chronic renal disease was strongly associated with nephrotoxic agent exposure from working environment such as agricultural works, production of crop and dusty work environment(27). A study found that there were no significant associations between chronic renal failure and pesticide exposure, heat stress, intake of non-steroidal anti-inflammatory drugs and consumption of alcohol(28). However, another study has shown that prevalence of chronic renal failure was increased among agricultural communities in tropical or subtropical countries such Central America, Sri Lanka and Indonesia(29).

Finding of this research has proved that generally patients with chronic renal failure who undergoing hemodialysis in Arifin Ahmad Hospital was live with good quality of life level. Previous study as asserted that quality of life is one of the most patient outcomes to evaluate effectiveness of hemodialysis therapy among chronic renal disease patients(30). A study has found that there is a difference quality of life between men and women who underwent dialysis in which men has higher quality of life scores than women across all domains when assessed in one year after initiation of hemodialysis(20). On the other hand, a study in Malaysia shown that the score of work

status, general health, physical functioning, function of cognitive, social life, sleep quality, patient satisfaction and role of emotion were lower than people without chronic renal failure disease(30). Furthermore, another study has found that low quality of life specifically associated to self-efficacy impairment, a high number of co morbidities among elderly patients who have lower education level (31).

This research also found that there is relationship between gender and age group with Qol but there is no significant relationship between occupation status and Qol among chronic renal failure who undergoing hemodialysis. Previous study found similar evident that variables age, gender, employment status and the length of hemodialysis were associated with one or more domains of quality of life such as physical, psychological, domain social and environmental domains (32). On the other hand, another study has shown that occupation status on dialysis patient was not associated to quality of life (33). Quality of life on dialysis patients not only influence by medical characteristic but also affected by social demographic factors particularly age group and gender (34). Existing evidence has highlighted that there is a significant difference quality of life among hemodialysis patients based on their age groups in which younger patient have better quality of life (32) and there is no difference quality of life on chronic renal failure patients without dialysis therapy but quality of life was better among male than female patients who was underwent hemodialysis(35). Furthermore, in order to improve quality of life among chronic renal failure who undergoing hemodialysis, administration of psychological care was greatly important to ameliorate psychological functioning and resolve emotional issues (36).

CONCLUSION

Patients with chronic renal failure which majority among them was female with various age group, employment status and majority among them was female patients who undergoing hemodialysis therapy routinely in Arifin Ahmad Public Hospital Pekanbaru Indonesia have a good quality of life. Recommended for nurses to consider age group and gender as a preference in dialysis care and take care domain of physical function, deliver psychosocial and environmental supports.

ACKNOWLEDGMENTS

The best appreciation to Director of Arifin Ahmad Hospital and their dialysis center officers for their invaluable contribution in facilitating research process.

REFERENCES

1. Hill NR, Fatoba ST, Oke JL, Hirst JA, O'Callaghan CA, Lasserson DS, et al. Global Prevalence of Chronic Kidney Disease – A Systematic Review and Meta-Analysis. *PLoS One*. 2016 Jul; 11(7):e0158765.
2. Luyckx VA, Tonelli M, Stanifer JW. The global burden of kidney disease and the sustainable development goals. *Bulletin of the World Health Organization*. 2018 Jun 1;96(6):414..
3. David H. ISN Global Kidney Health Atlas. International Society of Nephrology; 2019. [Cited on 2 July 2020]. Available from: www.theisn.org/global-atlas
4. Kerr PG, Tran HTB, Ha Phan HA, Liew A, Hooi LS, Johnson DW, Levin A; OSEA Regional Board. Nephrology in the Oceania-South East Asia region: perspectives and challenges. *Kidney Int*. 2018 Sep;94(3):465-470.
5. Indonesia Basic Health Research. Global Health Data Exchanges. Institute for Health Metrics and Evaluation. University of Washington 2013
6. Jha V. Current status of chronic kidney disease care in southeast Asia. *In Seminars in nephrology* 2009 Sep 1 (Vol. 29, No. 5, pp. 487-496). WB Saunders. DOI: 10.1016/j.semnephrol.2009.06.005
7. Indonesian Ministry of Health. Cegah Dan Kendalikan Penyakit Ginjal Dengan Cerdik Dan Patuh. 2018. <http://www.depkes.go.id/>
8. Brunner LS. Brunner & Suddarth's textbook of medical-surgical nursing. Lippincott Williams & Wilkins; 2010.
9. Surena, H. & Gagliardi R.. Brunner & Sudarth's Textbook of Medical Surgical Nursing. 12th Ed. China: Lippincott Wilkins; 2010
10. National Health Service (NHS). Diagnosis Chronic kidney disease; 2019. [cited on 1 July 2020]. Available from: <https://www.nhs.uk/conditions/kidney-disease/diagnosis/>
11. Indonesian Renal Registry (IRR). 10th Annual Report of Indonesian Renal Registry; 2017. Available from: <https://www.indonesianrenalregistry.org/data/IRR%202017%20.pdf>
12. American Kidney Fund. Chronic Kidney Disease (CKD); 2019. [Cited on 2 July 2020]. Available from: <https://www.kidneyfund.org/kidney-disease/chronic-kidney-disease-ckd/>
13. Bello AK, Alrukhaimi M, Ashuntantang GE, Basnet S, Rotter RC, Douthat WG, Kazancioglu R, Kuttgen A, Nangaku M, Powe NR, White SL. Complications of chronic kidney disease: current state, knowledge gaps, and strategy for action. *Kidney international supplements*. 2017 Oct 1;7(2):122-9.
14. Zampieri FG, Araujo F, Santos RH, Cavalcanti AB. Existing capacity for renal replacement therapy and site-specific practices for managing acute kidney injury at centers participating in the BaSICS trial. *Revista Brasileira de terapia intensiva*. 2018 Jul;30:264-85..
15. National Kidney Foundation (NKF). Clinical Practice Guideline For Hemodialysis. 2015 Cited on

- 3 July 2020]. Available from: <https://www.kidney.org/professionals/guidelines/hemodialysis2015>
16. Hyodo T, Fukagawa M, Hirawa N, Hayashi M, Nitta K, Chan S, Souvannamethy P, Dorji M, Dorj C, Widiana I. Present status of renal replacement therapy in Asian countries as of 2016: Cambodia, Laos, Mongolia, Bhutan, and Indonesia. *Renal Replacement Therapy*. 2019 Dec;5(1):1-1.
 17. Medical Record Officer. Report on Chronic renal Disease and Hemodialysis Patients. Arifin Ahmad Hospital Pekanbaru Indonesia; 2015
 18. Barbosa JB, Moura EC, Lira CL, Marinho PŃ. Quality of life and duration of hemodialysis in patients with chronic kidney disease (CKD): a cross-sectional study. *Fisioterapia em Movimento*. 2017 Oct;30:781-8..
 19. Lloyd H, Jenkinson C, Hadi M, Gibbons E, Fitzpatrick R. Patient reports of the outcomes of treatment: a structured review of approaches. Health and quality of life outcomes. 2014 Dec;12(1):1-9.
 20. Carrero JJ, Hecking M, Chesnaye NC, Jager KJ. Sex and gender disparities in the epidemiology and outcomes of chronic kidney disease. *Nature Reviews Nephrology*. 2018 Mar;14(3):151-64.
 21. Saran R, Robinson B, Abbott KC, Agodoa LYC, Bragg-Gresham J, Balkrishnan R, Bhave N, et.al. US Renal Data System 2018 Annual Data Report: Epidemiology of Kidney Disease in the United States. *Am J Kidney Dis*. 2019 Mar;73(3 Suppl 1):A7-A8. doi: 10.1053/j.ajkd.2019.01.001.
 22. Iseki K. Gender differences in chronic kidney disease. *Kidney international*. 2008 Aug 2;74(4):415-7.. doi:10.1038/ki.2008.261
 23. Fanelli C, Dellk H, Cavaglieri RC, Dominguez WV, Noronha IL. Gender differences in the progression of experimental chronic kidney disease induced by chronic nitric oxide inhibition. *BioMed research international*. 2017 Oct 18;2017.
 24. Hasan M, Sutradhar I, Gupta RD, Sarker M. Prevalence of chronic kidney disease in South Asia: a systematic review. *BMC nephrology*. 2018 Dec;19(1):1-2.
 25. Centers for Disease Control and Prevention (2019). Chronic Kidney Disease Surveillance System. 2019. [Cited o 4 July 2020]. Available from: <http://www.cdc.gov/ckd>
 26. Rubinstein S, Wang C, Qu W. Occupational risk and chronic kidney disease: a population-based study in the United States adult population. *Int J Nephrol Renovasc Dis*. 2013 Mar 9;6:53-9. doi: 10.2147/IJNRD.S39522.
 27. Sponholtz TR, Sandler DP, Parks CG, Applebaum KM. Occupational exposures and chronic kidney disease: Possible associations with endotoxin and ultrafine particles. *American journal of industrial medicine*. 2016 Jan;59(1):1-1..
 28. Gonz6lez-Quiroz M, Pearce N, Caplin B, Nitsch D. What do epidemiological studies tell us about chronic kidney disease of undetermined cause in Meso-America? A systematic review and meta-analysis. *Clinical kidney journal*. 2018 Aug;11(4):496-506..
 29. O'Callaghan-Gordo C, Shivashankar R, Anand S, Ghosh S, Glaser J, Gupta R, Jakobsson K, Kondal D, Krishnan A, Mohan S, Mohan V. Prevalence of and risk factors for chronic kidney disease of unknown aetiology in India: secondary data analysis of three population-based cross-sectional studies. *BMJ open*. 2019 Mar 1;9(3):e023353. doi: 10.1136/bmjopen-2018-023353
 30. Ramatillah DL, Sulaiman SA, Khan AH, Meng OL. Quality of life among patients undergoing hemodialysis in Penang, Malaysia. *Journal of pharmacy & bioallied sciences*. 2017 Oct;9(4):229.
 31. Mousa I, Ataba R, Al-ali K, Alkaiyat A, Sa'ed HZ. Dialysis-related factors affecting self-efficacy and quality of life in patients on haemodialysis: a cross-sectional study from Palestine. *Renal Replacement Therapy*. 2018 Dec;4(1):1-2.
 32. Joshi U, Subedi R, Poudel P, Ghimire PR, Panta S, Sigdel MR. Assessment of quality of life in patients undergoing hemodialysis using WHOQOL-BREF questionnaire: a multicenter study. *Int J Nephrol Renovasc Dis*. 2017 Jul 19;10:195-203. doi: 10.2147/IJNRD.S136522..
 33. Thenmozhi P. Quality of life of patients undergoing hemodialysis. *Asian J Pharm Clin Res*. 2018;11(4):219-23.Doi: <https://doi.org/10.22159/ajpcr.2018.v11i4.24007>
 34. Kim K, Kang GW, Woo J. The quality of life of hemodialysis patients is affected not only by medical but also psychosocial factors: a canonical correlation study. *Journal of Korean medical science*. 2018 Apr 2;33(14).
 35. Al-Mendalawi M. Assessment of health-related quality of life of hemodialysis patients in Benha City, Qalyubia Governorate. *Menoufia Medical Journal*. 2021 Jan 1;34(1):401-.
 36. Dąbrowska-Bender M, Dykowska G, Źuk W, Milewska M, Staniszevska A. The impact on quality of life of dialysis patients with renal insufficiency. *Patient preference and adherence*. 2018 Jan 1;12:577-84.