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Impact of Anemia on Quality of Life Among Patients Undergoing Dialysis with End-Stage Renal Failure

Rosnah Omar[1], Annamma Kunjukunju[1]*, Nurul Fariza[1]

[1]School of Nursing, KPJ Healthcare University, Nilai, Negeri Sembilan, Malaysia

*Corresponding author: ann@kpjuc.edu.my

Abstract

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Background: Reductions in quality of life among patients with End-Stage Renal Failure (ESRF) can be further compromised by anemia, which is a common complication of ESRF. This study evaluated the impact of anemia on the quality of life among dialysis patients with ESRF in a private dialysis center in Kuantan. Methods: The study used a cross-sectional design conducted on 113 ESRF patients at multiple dialysis centers in Kuantan. Demographic, socioeconomic, and disease status data were collected, and the Kidney Disease Quality of Life (KDQOL) short-version questionnaire was used to assess the patient's quality of life. Statistical analysis was performed using SPSS 26 to identify correlations among patient factors. Results: The study findings revealed that 46.4% have mild anemia, 38.4% have moderate anemia, and 16.2% have severe anemia.76% of respondents rated the quality of life as "Bad" and 6% as "Very Bad". Only 19% of respondents have rated the quality of life as "Normal." Conclusion: The findings suggest that anemia significantly affects the quality of life of patients with ESRF. These findings can help healthcare providers develop interventions to manage anemia and improve the quality of life of these patients. The study also emphasizes the importance of regular monitoring and management of anemia among patients with ESRF to ensure optimal health outcomes.

Keywords: Anemia, quality of life, end-stage renal failure, kidney failure, chronic kidney disease

Introduction

End-stage renal Failure (ESRF) is the final stage of chronic kidney disease in which the kidneys cannot function independently (Gusev, Solomatina, Zhuravleva, & Sarapultsev, 2021).End-stage renal failure is a GFR of less than 15 mL/min (Scott, Scuffham, Gupta, Harch, Borchi, 2020). In the last three decades, health systems have paid increasing attention to the quality of life (QOL). Health-related quality of life means measuring a dialysis patient's functioning, well-being, and general health perception in physical, psychological, and social domains. In evaluating outcomes in end-stage renal Failure (ESRF), quality of life has become as important as morbidity and mortality indicators (Pei et al., 2019). The quality of life in patients with End-Stage Renal Failure (ESRF) can be significantly affected due to the chronic nature of the illness and the need for regular treatment (Hussien, Apetrii, & Covic, 2021).

Up to 90% of individuals with ESRF experience anemia at some time throughout the disease (Vestergaard et al., 2020). The disease influences the quality of life of patients with end-stage renal disease, and anemia is a major consequence that frequently affects patients with ESRF and can significantly lower their quality of life (QOL) (Adamczuk & Roszkowska-Blaim, 2017). Anemia in ESRD is associated with further lowering the quality of life; even a minor reduction in hemoglobin can be associated with low quality of life. Diagnosis of anemia is made in adults and children over 15 years with chronic kidney disease (CKD) when hemoglobin (Hb) is below 13.0 g/dL (130 g/L) in males and below 12.0 g/dL (120 g/L) in females (McMurray et al., 2012). Iron deficiency, decreased erythropoietin synthesis, and decreased red blood cell lifespan all play a role in the complex pathophysiology of anemia in ESRF (Portolés, Martín, Broseta, & Cases, 2021). Anemia can cause various symptoms, such as fatigue, weakness, shortness of breath, and a decreased ability to tolerate physical activity, all of which can significantly affect dialysis patients; quality of life (QOL) (Hussien, Apetrii, & Covic, 2021). Studies have demonstrated a significant improvement in quality of life after initiating replacement supplement medication treatment to treat anemia in dialysis patients and those with early renal failure (McMurray et al., 2012).

Omar et al. AJPHN 2024; 1 (X): - http://doi.org/10.62377/sz9xt160

Additionally, it has been discovered that anemia negatively affects QOL in individuals with chronic kidney disease who are not yet receiving dialysis (Mathias et al., 2020). Anemia was linked to lower QOL ratings in patients with chronic renal disease who had not yet started hemodialysis (Portolés et al., 2021). Anemia is linked to worse QOL across various dimensions, including physical functioning, role functioning, and emotional well-being in hemodialysis patients with chronic kidney disease (Najafi, Keihani, Bagheri, Jolfaei, & Meybodi, 2016). This study aimed to determine the impact of anemia on the quality of life among dialysis patients with end-stage renal failure in a private dialysis center in Kuantan, Malaysia.

Method

A cross-sectional study design was adopted and carried out in the hemodialysis unit of the Private Dialysis Centre in Kuantan from January to February 2023. The study included adult patients over the age of 18 who had been diagnosed with ESRF and had been on regular hemodialysis for at least six months. Patients who were younger than 18 years of age, had been on hemodialysis for less than six months, were unable to understand the study due to conditions such as dementia or mental retardation, or those who refused to participate were excluded from the study. Patients with CKD not on dialysis also were excluded from the study.

The data was collected using a questionnaire divided into three sub-sections. Section A was on demographic background, Section B was on the quality of life, and Section C was on the prevalence of anemia. The quality of life questionnaire with 15 items was adapted and modified from 2 sources (Kraus et al., 2016; Van Haalen, Jackson, Spinowitz, Milligan, & Moon, 2020). Section A was on demographics and the information on age, sex and race was included. Section C was on prevalence and data was collected from the patient's case notes using data collection form as a retrospective observational method. Section B was administered face-to-face to targeted respondents. Informed consent was obtained from all participants before the administration of the questionnaire.

Anemia was defined as per Kidney Disease: Improving Global Outcomes (KDIGO) guidelines as Hemoglobin (Hb) <13.0g/dl in males and <12g/dl in females (McMurray et al., 2012). This study defined mild anemia as Hb10-10.9 g/dL, whereas moderate and severe anemia was defined as HB 7-10g /dL and <7 gm /dL, respectively. The IBM SPSS v.25 was used to perform all calculations and record the data from the samples used in this study. Categorical variables were analyzed as frequency and percentages. Comparison of continuous variables was analyzed using correlation and regression analysis.

Ethical approval

The permission to collect data was obtained from the institution review board (KPJUC/RMC/EC/2022/432) and the dialysis center's management.

Results

Demographic profile of the respondents

A total of 113 cases were included in the study. The highest number of respondents were females (51%) aged 50 and above (59.8%) from the Malay ethnic group (74%). The patient's demographic data is shown in Table 1.

Table 1. Demographic profile of study respondents

Variables		Frequency	Percent
Gender	Female	57	51
	Male	56	49
Age	32-40	2	1.8
	40-49	43	38.4
	50 and above	68	59.8
Race	Malay	83	74
	Chinese	25	21.5
	Indian	5	4.5

Omar et al. AJPHN 2024; 1 (X): - http://doi.org/10.62377/sz9xt160

Concerning the prevalence of anemia among patients with ESRF on dialysis, it was found that 46.4% had mild anemia, 38.4% had moderate anemia, and 16.2% had severe anemia, with the highest percentage in mild anemia. Detail on the prevalence of anemia is provided in Table 2. Quality of life was rated by 76% as "Bad," 6% as "Very Bad," and 19% rated as normal. The highest percentage reported that the quality of life was bad.

Table 2. Prevalence of anemia

		Frequency	Per cent
Prevalence of anemia	Mild (Hb:10-10.9 g/dL)	52	46.4
	Moderate (Hb: 7-9.9 g/dL)	44	38.4
	Severe (<7g/dL)	18	16.2
	Total	113	100.0

Discussion

The study found that the number of male and female patients with ESRF attending dialysis was equal. This may be due to the small sample size in the current study. However, in another study, males reported having a higher incidence of ESRF (Harris & Zhang, 2020). The majority (59.8%) were aged 50 years and above. Advancing age was reported to be one factor contributing to the increased incidence of ESRF (Harford, Clark, Norris, & Yan, 2016). The result shows that in the population being studied for anemia, 46.4% have mild anemia, 38.4% have moderate anemia, and 16.2% have severe anemia. Previous studies have shown that the prevalence of Anemia varied grossly in different countries. Cameroon reported the highest at 79%, followed by China at 51.5% and India at 39.36%. However, the USA reported the lowest prevalence of anemia, 14%, among patients with chronic kidney disease. The prevalence of anemia also highly varied based on the stages of chronic kidney disease, with 22.4%, 41.3%, and 53.9% in stages 3, 4 and 5, respectively. The study reported the highest prevalence among stage 5 patients, ESRF (Bishaw, Belay Woldemariam, Mekonen, Birhanu, & Abebe, 2023). Anemia is a common complication of Chronic kidney disease and is associated with many adverse outcomes like cognitive impairment, sleep disturbances, and cardiovascular and cerebrovascular complications (Bishaw et al., 2023). A Kidney Disease Outcomes Quality Initiative (KDOQI) study found that approximately 80% of hemodialysis patients had anemia (Bello et al., 2022). In this study, the prevalence of anemia is lower, with only 46.4% of the population with mild anemia. This difference in findings could be due to differences in the study population, sample size, and methodology.

Research objective two was to determine the quality of life among dialysis patients with end-stage renal failure in private dialysis centers. The dialysis patients with ESRF in private hospitals are commonly thought to have a low quality of life. With 76% of respondents rating the topic as "Bad" and 6% as "Very Bad," most respondents rated QOL as either a "Bad" or "Very Bad" grade. The findings suggest that ESRF and the need for regular dialysis treatment negatively influence the quality of life of a sizeable section of the population under study. These findings are consistent with previous research on the quality of life among dialysis patients. Dialysis patients had lower quality of life scores than the general population (Bishaw et al., 2023). Dialysis patients in Malaysia had lower quality of life scores than the general population, and certain factors, such as age and comorbidities, also contributed to lower quality of life scores (Soon, Lim, Rampal, & Su, 2019).

The results also highlighted the mean quality of life for individuals with mild anemia is 40.3, for moderate anemia is 36.3, which is bad or poor quality of life. The findings are in congruent with similar study findings(Hussein et al., 2021; Najafi et al., 2016; Pei et al., 2019; van Oevelen et al., 2023) However, for patients with severe anemia it was 41.9 with a mean± SD of 39.0±6.02 which is at the borderline of bad to normal. The findings is not a usual pattern in patients with ESRD (Salman et al., 2016; Van Haalen et al., 2020). However, the negative findings may be because of the small sample size in this study and therefore statistically not significant.

The relationship between Anemia and Quality of life is generally considered strong, with a Pearson correlation of 0.749. The correlation is highly significant, as evidenced by the significance p value of 0.001 for mild, moderate, and severe anemia. These findings are consistent with previous research on the relationship between anemia and quality of life among dialysis patients. Anemia significantly predicted decreased quality of life among dialysis patients (Van Haalen et al., 2020; Wouters et al., 2019).

The study was conducted in a few dialysis centers in Kuantan, Pahang, Malaysia, and most patients were of Malay ethnicity. Therefore, the findings may not be representative of the multi-ethnic Malaysian population. It is recommended that the study be conducted using a large sample size to include the general population. The study can also be conducted using different scales to measure QOL.

Conclusion

The study findings reveal that the prevalence of anemia among patients with ESRF is very common among patients undergoing dialysis and associated with low quality of life. Earlier identification and proper management of anemia may help improve the quality of life of patients with ESRF on dialysis. There are many therapeutic interventions in place to treat anemia among such patients. Adherence to the treatment regimen and patient education are important factors in improving the quality of life among patients with ESRD and having anemia.

Conflict of Interest: This study has no conflict of interest.

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