THE CORRELATION BETWEEN SOCIODEMOGRAPHIC FACTORS TOWARDS THE QUALITY OF LIFE OF PATIENTS WITH CHRONIC KIDNEY DISEASE UNDERGOING HEMODIALYSIS: A BASIS FOR PATIENT SUPPORT

Clint T. Abelo, Hans Angelo L. Atillo, Ericka Elise E. Ba-a, Kent F. Besabella, Angel Faith C. Caputolan, Aureill Flores, Eljee Rajmah Gabronino, Francine Marie Dane N. Gaviola, Earvin I. Gendraule, and Star D. Isagan

College of Nursing, Cebu Doctors' University

Article History
Date Submitted: May 5, 2025
Date Accepted: TBA
Date Published: TBA
Corresponding Authors: Clint T. Abelo, Hans Angelo L. Atillo, Ericka Elise E. Ba-a, Kent F. Besabella, Angel Faith C. Caputolan, Aureill Flores, Eljee Rajmah Gabronino, Francine Marie Dane N. Gaviola, Earvin I. Gendraule, and Star D. Isagan, College of Nursing, Cebu Doctors' University, Mandaue City, Cebu, Philippines

Abstract: This study was conducted to determine the correlation between selected sociodemographic factors and the quality of life of patients with Chronic Kidney Disease (CKD) undergoing hemodialysis as a basis for enhancing supportive care interventions. Using a descriptive correlational approach, the study assessed the quality of life of 126 CKD patients receiving hemodialysis treatment at Cebu Doctors' University Hospital. The original version of the World Health Organization Quality of Life Brief Version (WHOQOL-BREF) was utilized to evaluate quality of life across four domains: physical, psychological, social, and environmental. Sociodemographic variables examined included age, sex, educational attainment, marital status, household income, occupational status, and comorbidities. Data were analyzed using SPSS version 23.0. Means, standard deviations, frequencies, and percentages were used for descriptive statistics. Relationships were tested using chi-square, point biserial correlation, Phi coefficient, and Cramer's V, with a 0.05 significance level. Findings revealed that both educational attainment and occupational status consistently exhibited moderate correlations in the physical, psychological, and social domains while other factors, such as age, sex, income, marital status, and comorbidities, showed weaker correlations to the various domains.

Keywords: Sociodemographic factors, quality of life, Chronic Kidney Disease, hemodialysis, WHOQOL-BREF

I. INTRODUCTION

Chronic Kidney Disease (CKD) is a worldwide health problem that impacts more than 10% of the population, and most patients need hemodialysis therapy throughout their lives. CKD has a significant impact on patients' quality of life (QoL), which, according to the World Health Organization (1997), encompasses physical, psychological, social, and environmental well-being. Hemodialysis has the potential to interfere with these aspects by physically restricting them, causing emotional distress, and limiting their lifestyle.

International research shows that sociodemographic factors such as age, sex, education, marital status, income,

employment or occupational status, and comorbidities significantly influence QoL among CKD patients. Muthuvenkatachalam et al. (2020) found that lower levels of education and income were associated with poorer QoL outcomes among Indian hemodialysis patients. Fernandez et al. (2019) also reported that Latin American patients who were older and female experienced greater treatment burdens.

In Southeast Asia, the patients also face the same issues. Fatima (2021) stated that the social withdrawal and emotional distress of Pakistani CKD patients, particularly those belonging to lower-income groups. In Indonesia and Malaysia, educational inequalities and healthcare access also correlate with poor treatment adherence and lower QoL (Ahmad et al., 2018). El-Agroudy et al (2020) placed greater emphasis on marital status and concluded that married patients are most likely to have a more positive QoL than those who are not.

In the Philippines, CKD continues to be a leading cause of death, and hemodialysis is also economically unfeasible despite the partial subsidy. Pagatpatan (2018) noted that unemployment and low income constrain patients' capacity for continuous treatment and self-management. Ordonez et al. (2020) and Gutierrez and Tumangday (2021) observed that increased education and employment supported better psychological resilience and QoL outcomes for Filipino CKD patients. In the context of CKD itself, individuals having hypertension, diabetes, and other cardiovascular diseases most likely have or are yet to develop kidney complications. Drawing on international and local studies, this study investigates how sociodemographic determinants affect the QoL of patients with CKD on hemodialysis in the Philippines. By identifying principal correlations, the study seeks to guide the development of an intervention that is evidence-based and that improves the lives of patients in the local health environment.

II. Methodology

This study employed a **quantitative descriptive-correlational research design** to examine the relationship between sociodemographic characteristics and the quality of life (QoL) of patients undergoing hemodialysis. The design enabled the researchers to measure variables and statistically assess their interrelationships without manipulating any elements of the study environment.

The research was conducted at the RICU at Cebu Doctors University Hospital (CDUH), located on Osmeña Boulevard, Cebu City. This facility provides services to a large population of patients with end-stage renal disease (ESRD), making it an appropriate setting for gathering reliable and relevant data.

The study assessed the quality of life (QoL) of CKD patients undergoing hemodialysis at CDUH, using complete enumeration based on a November 2024 census of 153 patients. By the data collection period in March 2025, the total number had adjusted to 151 due to transfers, deaths, and limited new

admissions. Although the researchers aimed to include all patients, only 126 participated, as 25 were excluded based on ethical and medical criteria. Specifically, four were under isolation for infectious diseases, two were underage, one failed a cognitive screening due to speech impairment, and eighteen declined participation. All exclusions adhered to established ethical standards.

Inclusion criteria included adult patients aged 18 years and above, of either sex, who had been undergoing hemodialysis for at least six months, were fully conscious and oriented, and voluntarily agreed to participate by signing the informed consent form. Patients were excluded if they had acute kidney injury, any form of diagnosed mental disorder, or were unable to complete the questionnaire independently due to physical or cognitive impairment.

The demographic profile of respondents consisted of both male and female participants, with ages ranging from 18 to 75 years. Most respondents came from middle to low-income households and were of Filipino ethnicity. Other sociodemographic characteristics such as civil status, educational attainment, occupation, and monthly income were also collected as part of the independent variables examined in the study.

Data collection was facilitated using a structured, researcher-developed questionnaire composed of two main sections. The first part gathered the sociodemographic profile of the respondents. The second part consisted of the WHOQOL-BREF instrument developed by the World Health Organization. This standardized 26-item scale measures quality of life across four domains: physical health, psychological well-being, social relationships, and environment. The instrument has been widely validated and used in global and local studies involving chronic illness populations.

To ensure instrument validity and reliability, the WHOQOL-BREF was assessed for internal consistency, yielding a Cronbach's alpha of 0.88 in this study, indicating a high level of reliability. Additionally, the instrument has demonstrated acceptable convergent validity when compared with other quality-of-life tools used in similar studies on hemodialysis patients in the Philippines.

Data gathering involved coordination with the management and staff of the dialysis center. After identifying eligible participants, the researchers explained the study purpose and obtained written informed consent. Questionnaires were administered during dialysis sessions, with research assistants available to support patients who had difficulty writing, ensuring their answers remained unbiased and confidential.

The collected data were encoded and analyzed using the Statistical Package for the Social Sciences (SPSS) version 25. Descriptive statistics such as frequency and percentage were used to summarize the demographic profile. Mean and standard deviation were calculated for the quality-of-life scores. Pearson's correlation coefficient (Pearson's r) was employed to determine the statistical relationship between sociodemographic variables and QoL scores.

Ethical approval for the conduct of the study was obtained from the Institutional

Research Ethics Committee of the university. Participation in the study was voluntary, and all respondents signed an informed consent form. The study observed ethical principles including autonomy, beneficence, non-maleficence, and justice. The confidentiality and anonymity of participant information were strictly maintained throughout the research process.

Table 1. Profile of the Respondents (*N* = 126)

		Profile of the Respondents	
		Frequency (*f*)	Percentage (%)
Age	Younger Group (<50 years old)	40	31.7
	Middle-Older Group (50-64 years old)	49	38.9
	Older Group (≥65 years old)	37	29.4
Sex	Male	53	42.1
	Female	73	57.9
Educational Attainment	None at all	0	0.00
	Elementary	7	5.6
	Junior High School	24	19.0
	Senior High School	2	1.6
	College	88	69.8
	Postgraduate	5	4.0
Marital Status	Single	25	19.8
	Married	85	67.5
	Separated	4	3.2
	Widowed	12	9.5
	<P10,957	24	19.0
	P10,957 - P21,193	43	34.1
	P21,194 - P43,827	28	22.2

Household Income	P43,828 - P76,668	13	10.3
	P76,669 - P131,483	9	7.1
	P131,484 - P219,139	5	4.0
	>P219,140	4	3.2
Occupational Status	Unemployed	102	81.0
	Employed	24	19.0

Age

Table 1 presented the demographic and clinical characteristics of 126 patients with chronic kidney disease (CKD) undergoing hemodialysis. The age distribution showed that most patients (49, 38.9%) were aged 50–64 years, followed by those under 50 years (40, 31.7%) and those aged 65 and above (37, 29.37%). This indicated that CKD requiring hemodialysis was prevalent among middle-aged and older adults.

This complements the findings of Sisook, Eunhye, and Eunjung (2019) by reinforcing the notion that age is a significant factor influencing self-care management in hemodialysis patients. It highlights the need for age-specific interventions to improve self-care behaviors, especially among older adults who may face more challenges due to physical decline and comorbid conditions.

Sex

Regarding sex, Table 1 showed that the majority of respondents were female (73, 57.9%), while males comprised 42.1% (53 respondents). According to the National Kidney Foundation (2024), CKD is more prevalent in women, partly due to factors such as urinary tract infections and pregnancy-related complications like eclampsia. However, CKD progression tends to be faster in men, linked to unhealthy lifestyle habits.

The study's finding of higher female prevalence (57.9%) supported the National Kidney Foundation's data, affirming that women are more susceptible to CKD than men.

Educational Attainment

Table 1 also summarized the educational attainment of the 126 patients. Most had completed college (88, 69.8%), followed by junior high school (24, 19.0%), elementary (7, 5.6%), postgraduate studies (5, 4.0%), senior high school (2, 1.6%), and none (0, 0.0%). This distribution suggested high access to education, potentially enhancing patients' health literacy and disease management skills.

This aligned with Tordova and Hristova (2022), who found that education improves quality of life (QoL) by equipping hemodialysis patients with knowledge for effective management. Similarly, Cheung and LaMantia (2019) noted that higher education protects against cognitive decline, indirectly supporting better treatment adherence.

Conversely, Svendsen et al. (2020) also found low health literacy associated with suboptimal health behaviors. Nevertheless, some low-education individuals still adopted health-promoting behaviors.

The small number of postgraduate respondents reflected national trends, where postgraduate education remains uncommon (CEIC, 2018). The low senior high school percentage could be attributed

to the study's predominantly middle-aged sample, as the senior high school program was implemented only recently under the K to 12 curriculum. Lastly, no respondents reported having no formal education, suggesting a baseline level of educational access in this urban, hospital-affiliated setting.

Yolgosteren (2020) further emphasized the link between education and vascular access outcomes in hemodialysis, indicating that education-specific interventions can improve treatment responses and QoL.

Marital Status

Table 1 showed that most respondents were married (66.67%), followed by single (19.84%), widowed (9.52%), separated (3.17%), and others (0.79%). The high proportion of married individuals aligned with findings that marital status significantly impacts QoL in hemodialysis patients. Marriage, common in the national demographic, is associated with emotional, social, and economic support, which positively influences QoL (Molsted et al., 2021; Iqbal et al., 2021).

In contrast, single individuals (19.84%) may face challenges due to lacking spousal support. Wang et al. (2021) noted that single patients might delay care-seeking and struggle with adhering to treatment without partner support.

Widowed patients (9.52%) also face unique challenges. H. Wang et al. reported that widowhood increases psychological distress, negatively affecting adherence and outcomes. Many widowed patients belonged to older age groups, adding to their vulnerability.

Separated individuals (3.17%) faced health risks linked to emotional distress and financial instability post-separation. Wang et al. (2021) found that separation increases stress and risky behaviors (e.g., smoking, alcohol use), which could accelerate kidney damage in CKD patients.

Household Income

Table 1 further described household income based on PIDS categories. The largest group earned ₱10,957–₱21,193 (low income but not poor; 43, 34.1%), followed by ₱21,194–₱43,827 (lower middle class; 28, 22.2%) and below ₱10,957 (poor; 24, 19.0%). These three groups comprised over 75% of the sample, indicating a concentration in lower socioeconomic strata.

Only a small portion belonged to higher income brackets: middle class (₱43,828–₱76,668; 13, 10.3%), upper middle income (₱76,669–₱131,484; 9, 7.1%), high income but not rich (₱131,485–₱219,140; 5, 4.0%), and rich (over ₱219,140; 4, 3.2%).

The prevalence of CKD patients in lower-income brackets is largely due to limited access to early diagnosis and care, resulting in faster disease progression (Li et al., 2025).

The lower middle class, often comprising urban-based workers, is especially vulnerable due to lifestyle and occupational factors, such as sedentary routines and stress (Tannor et al., 2022).

Expanded government subsidies, such as the PhilHealth dialysis package, provide some support but do not cover all medical expenses (SunStar Cebu, 2024).

The higher income groups, though they make up a small portion of the sample, have better access to early diagnostics, nephrology care, and alternative treatments like peritoneal dialysis (Tannor et al., 2022).

In summary, the higher frequency of hemodialysis patients in lower-income households indicates delays in CKD diagnosis and treatment due to financial constraints, whereas wealthier groups have

more access to early care, slowing disease progression. Closing these income-based healthcare gaps is essential to improving outcomes for all CKD patients.

Occupational status

Table 1.0 shows that 102 (80.95%) of 126 hemodialysis patients were unemployed, while 24 (19.05%) were employed. Employment status plays a significant role in the quality of life (QoL) for these patients. Employed individuals tend to feel more secure and social, but may suffer from increased pain and symptoms due to work demands. Unemployed patients, however, may experience fewer symptoms and have more time to interact with family, improving their well-being (Anees et al., 2018).

The high unemployment rate can be attributed to two main factors: age and financial constraints. Younger patients may struggle with balancing work and treatment, while older patients face challenges from disease progression. Financially, the cost of treatment and the need for frequent dialysis make it hard for patients to maintain employment (Alma et al., 2022). PhilHealth provides some financial support, but additional out-of-pocket costs still strain patients, especially those from low-income backgrounds (Hanspal et al., 2021; Bay et al., 2024).

In conclusion, the high unemployment rate among hemodialysis patients reflects both health-related challenges and the financial burden of treatment, emphasizing the need for supportive policies and resources.

Table 1.1. **Comorbidities Among Patients**

Comorbidities	**Frequency (*f*)**	**Percentage (%)**
Hypertension	74	67.9%
Diabetes	60	55.0%
Chronic Glomerulonephritis	29	26.6%
Hypertensive Nephrosclerosis	1	0.9%
Cancer	1	0.9%
Fatty Liver Disease	1	0.9%
Hyperlipidemia	1	0.9%
Heart Failure	3	2.8%
Hypotension	1	0.9%
Stroke	1	0.9%
Cataract	2	1.8%
Asthma	1	0.9%

Autosomal Dominant Polycystic Kidney Disease	1	0.9%
Closed Angle Glaucoma	1	0.9%
Hypothyroidism	1	0.9%
Cardiac Arrhythmia	1	0.9%
SLE	3	2.8%
Brain Injuries	2	1.8%
Paralysis	1	0.9%
Hyperthyroidism	1	0.9%
TOTAL	**186**	**170.6%**

Note: *This table is a multiple response item. The percentage do not equal to 100%*

This study identified that patients with chronic kidney disease (CKD) may present with single or multiple comorbidities. The most prevalent was hypertension, affecting 67.9% of respondents, followed by diabetes mellitus (55%) and chronic glomerulonephritis (CGN) (26.6%). These findings align with established literature indicating that hypertension and diabetes are the leading contributors to CKD progression (Ku et al., 2019; Hahr & Molitch, 2021).

Hypertension's dominance among comorbidities reflects the compromised hemostasis in CKD patients, particularly those undergoing hemodialysis. Persistent high blood pressure exacerbates renal impairment and is associated with a poorer prognosis (Ku et al., 2019). Similarly, diabetes-related cardiovascular effects exert prolonged stress on nephrons, accelerating kidney damage. Conversely, impaired renal function may disrupt glucose metabolism, contributing to or worsening diabetes (Hahr & Molitch, 2021).

CGN, though less prevalent, remains a significant etiological factor in CKD. It accounts for 8%–16% of CKD cases globally and is associated with poor outcomes due to its inflammatory impact on nephron integrity (Sui et al., 2020). Other comorbidities, such as heart failure and systemic lupus erythematosus (SLE), were infrequent in this cohort, each reported in only three cases, likely influenced by genetic or autoimmune factors.

Overall, the presence of hypertension, diabetes, and CGN substantially contributes to CKD progression and underscores the interconnected nature of these chronic conditions. Less common comorbidities appear to be more case-specific and may not significantly impact broader epidemiological patterns.

Table 2. Quality-of-life Scores of the respondents

Domains	Poor (0-49)	Neutral (50)	Good (51-100)
Physical	53 (42.06%)	13 (10.32%)	60 (47.62%)
Psychological	60 (47.62%)	10 (7.94%)	56 (44.44%)

Social	17 (13.49%)	22 (17.46%)	87 (69.05%)
Environmental	13 (10.32%)	20 (15.87%)	93 (73.81%)

Table 2 presented the QoL of patients undergoing hemodialysis, emphasizing the domains of physical, psychological, social, and environmental health.

Physical Domain

The findings showed a nearly equal division between patients rating their physical health as “Good” (47.62%) and “Poor” (42.06%), reflecting the heterogeneous physical experiences of patients undergoing dialysis. Those reporting good physical health may have benefited from early-stage treatment, fewer dialysis sessions, and the use of arteriovenous fistulas (AVFs), which have been associated with fewer complications and better outcomes (Sikora et al., 2024).

Conversely, the high proportion reporting poor physical health is consistent with previous research indicating that long-term dialysis contributes to chronic fatigue, pain, and physical limitations (Rao et al., 2022). These effects are often exacerbated in elderly patients, where diminished physiological reserves intensify the burden of treatment (Tsirigotis et al., 2022). Sleep disturbances, commonly due to conditions like restless legs syndrome, were also cited as major contributors to physical deterioration (Alshammari et al., 2023).

Psychological Domain

Nearly half (47.62%) of the respondents reported poor psychological QoL, which supports findings on the mental health burden among CKD patients undergoing hemodialysis. Depression and anxiety are highly prevalent in this group, often triggered by the chronic, incurable nature of the disease, uncertainty about the future, and physical deterioration (Maharjan, 2022).

However, 44.44% of participants rated their psychological QoL as “Good,” suggesting that many patients have found ways to adapt. Protective factors include strong social support, which reduces depressive symptoms and fosters resilience (Sulkowski et al., 2024), and self-acceptance, which has been linked with improved coping mechanisms and adherence to treatment (Indarti et al., 2023). The 7.94% reporting neutral QoL may represent a transitional population, susceptible to changes based on fluctuating emotional or treatment-related stressors.

Social Domain

Social QoL emerged as a strength, with 69.05% of respondents indicating a good experience in personal relationships, support systems, and sexual well-being. Strong social and familial support helps patients better cope with the psychological and physical demands of dialysis. Emotional support can buffer stress and enhance treatment compliance, promoting a sense of normalcy and inclusion.

On the other hand, 17.46% reported a neutral social QoL, possibly reflecting patients who maintain functional relationships but lack emotional satisfaction, which may stem from body image issues and diminished intimacy (Scholes-Robertson, 2023). Those reporting poor QoL (13.49%) likely suffer from social isolation, stigmatization, and inadequate support, conditions that have been

associated with lower treatment adherence and heightened psychological distress (Alshraifeen et al., 2020).

Environmental Domain

The environmental domain showed the highest proportion of respondents reporting a good QoL (73.81%), indicating general satisfaction with healthcare accessibility, affordability, and support services. Carandang et al. (2024) found that these factors significantly influence perceived environmental quality among dialysis patients.

However, 10.32% reported poor environmental QoL, often due to transportation difficulties and the reliance on others to reach treatment centers—an issue documented by Yazawa et al. (2019), who noted that limited autonomy in transport negatively affects physical and psychological well-being.
The 15.87% with neutral responses may reflect mixed experiences, balancing the availability of healthcare with logistical or systemic barriers that still hinder access and comfort.

Table 3.0 Relationship of Profile of the Respondents to the Physical Domain

	Physical Domain	
	Correlation Coefficient	Interpretation
Age	*V*=.177	Weak
Sex	*rpb*=.107	Weak
Educational Attainment	*V*=.324	Moderate
Marital Status	*V*=.166	Weak
Household Income	*V*=.099	Weak
Occupational Status	*rpb*=.337	Moderate
Comorbidities	*V*=.192	Weak

Table 3.0 presented the correlation between sociodemographic and health-related factors and the physical domain of well-being, using Cramer's V and point biserial correlation (rpb) as appropriate. Most variables showed weak associations, with only educational

attainment and occupational status demonstrating moderate correlations.

Age

The correlation between age and the physical domain was weak (V = .177), indicating that age had a minimal association with physical well-being. Aging was commonly linked to physiological decline and increased disease risk; however, this finding suggested that chronological age alone was not a primary determinant of physical health.

Luo et al. (2019) described aging as a process of cellular deterioration and functional loss, which heightened susceptibility to chronic conditions such as cancer and diabetes. Despite this, the weak correlation observed in the present study challenged the assumption that aging directly predicted poor physical health outcomes.

In support of this, Moreno-Agostino et al. (2020) found that physical inactivity, rather than age itself, significantly influenced health trajectories. Their findings emphasized that modifiable lifestyle behaviors—such as physical activity—played a crucial role in maintaining physical well-being despite advancing age.

Sex

Sex demonstrated a weak correlation with the physical domain (rpb = .107), indicating only a slight difference in physical well-being between males and females in the studied population.

Lerma et al. (2021) reported that female hemodialysis patients experienced lower quality of life compared to males, often attributed to hormonal and physiological differences. However, the weak correlation found in this study suggested that biological sex alone did not significantly influence physical health outcomes.

Supporting this, Kaufman et al. (2023) emphasized that social, behavioral, and structural determinants—such as gender roles and healthcare accessibility—played a more substantial role than biological sex in shaping physical well-being.

Educational Attainment

The correlation between educational level and the physical domain was moderate (V = .324), indicating that higher educational attainment was associated with better physical well-being among hemodialysis patients.

Yahya et al. (2021) and Li et al. (2022) demonstrated that individuals with higher health literacy—typically more prevalent among those with higher education—managed chronic kidney disease more effectively, resulting in lower hospitalization rates and improved treatment adherence.

Todorova and Hristova (2022) also highlighted that education enhanced patients' ability to follow treatment regimens, advocate for their health, and access necessary resources, thereby contributing to better physical functioning.

Marital Status

Marital status showed a weak correlation (V = .166) with the physical domain, suggesting that being single, married, or in another relationship had minimal influence on physical health.

El-Agroudy et al. (2020) found that married patients reported higher satisfaction with emotional support; however, this did not result in improved physical health. Ravindran et al. (2020) observed that some unmarried patients had higher quality of life, possibly due to fewer responsibilities and stressors.

Thus, emotional support from partners may be beneficial, marital status did not significantly impact physical outcomes in this study.

Household Income

The correlation between household income and the physical domain was weak (V = .099), indicating that income had a limited impact on physical well-being in this population. While income is typically linked to better access to healthcare, this result suggests that income alone did not significantly influence physical health.

Nuñez (2024) highlighted that economic constraints can limit treatment adherence. However, the expanded dialysis support from PhilHealth (2024), which provided nearly ₱1 million per year for CKD5 patients, likely alleviated the financial burden, thereby weakening the relationship between income and physical health outcomes.

Most respondents fell within the low-income or lower-middle-class categories but were likely able to sustain treatment due to the insurance support provided.

Occupational Status

Occupational status showed a moderate correlation (rpb = .337) with the physical domain, indicating that employment positively influenced physical well-being, likely due to financial security, routine, and access to health resources.

Rathi et al. (2021) found that employed hemodialysis patients had better physical functioning and missed fewer treatments. Sharma et al. (2022) emphasized that employment supported self-care and physical activity.

However, some studies noted that manual labor could exacerbate symptoms, leading to increased fatigue and pain (Anees et al., 2018; Okafor et al., 2024). Despite this, employment overall correlated with improved physical outcomes in this population.

Comorbidities

The correlation between comorbidities and the physical domain was weak (V = .192), indicating that multiple health conditions had minimal impact on physical well-being in this population. Comorbidities were typically expected to affect physical health, the weak correlation suggested individual variability in their impact or the effectiveness of health management.

Cha and Han (2020) found that comorbidities such as cardiovascular diseases, diabetes, and hypertension negatively impacted the quality of life of hemodialysis patients, with those having comorbidities showing a 34% lower physical health score. Additionally, patients with these conditions had higher rates of depression and anxiety (Swathi et al., 2023). Despite these findings, the weak correlation in this study suggested that effective treatment and support systems may have mitigated the impact of comorbidities on physical health.

3.1 Relationship of the Profile of the Respondents to the Psychological Domain

	Psychological Domain

	Correlation Coefficient	Interpretation
Age	*V*=.126	Weak
Sex	*rpb*=.089	Weak
Educational Attainment	*V*=.381	Moderate
Marital Status	*V*=.205	Weak
Household Income	*V*=.077	Weak
Occupational Status	*rpb*=.363	Moderate
Comorbidities	*V*=.271	Weak

Table 3.1 presents the relationship between respondents' sociodemographic profiles and the psychological domain of quality of life, which, according to the World Health Organization (WHO), includes factors such as self-image, negative thoughts, positive attitudes, self-esteem, learning ability, memory, concentration, and spirituality. The findings indicate that most variables—age (V = .126), sex (rpb = .089), marital status (V = .205), household income (V = .077), and comorbidities (V = .271)—have weak correlations with the psychological domain, suggesting that their impact on psychological well-being is limited or indirect.

In contrast, educational attainment (V = .381) and occupational status (rpb = .363) showed moderate correlations, implying that these factors have a more significant influence on psychological well-being among hemodialysis patients. This aligns with Abun et al. (2021), who noted that education and employment enhance self-efficacy, personal growth, and a sense of purpose.

Age

Regarding age, while Sisook, Eunhye, and Eunjung (2019) emphasized that age is a risk factor for illness perception and psychological outcomes, our findings align more with Butt et al. (2022) and Alshelleh et al. (2022), who argue that psychological health is shaped by complex factors beyond age, such as social support and comorbidities. These support the conclusion that age alone is not a reliable predictor of psychological distress.

Sex

Sex also showed a weak correlation. While Mosleh et al. (2020) and Lerma et al. (2021) found that females on hemodialysis are more prone to anxiety and report lower QoL, our findings are better supported by Shankar et al. (2024), who revealed that depressive symptoms, rather than sex itself, significantly influence psychological well-being.

Educational Attainment

Educational attainment demonstrated a moderate correlation, indicating its meaningful role in psychological health. This is supported by Huang et al. (2024), who found lower educational levels associated with poorer health literacy; Cheung and LaMantia (2019), who linked education to cognitive resilience; and Todorova and Hristova (2022), who highlighted education's role in promoting self-efficacy and emotional

stability. Raghupathi and Raghupathi (2020) further affirm that education supports better health behaviors. Though Bakker et al. (2024) noted the effect may not be strong, the consensus is that education positively contributes to psychological adaptation in chronic illness.

Marital Status

Marital status (V = .205) showed a weak correlation. While El-Agroudy et al. (2020) noted that spouses can offer emotional and practical support, Ravindran et al. (2020) observed higher QoL among unmarried patients due to fewer burdens. Nagy et al. (2023) found marital status impacted family and social support but not psychological well-being, affirming our result.

Household Income

Household income (V = .077) also had a weak correlation. Though Nuñez (2024) emphasized the burden of treatment costs, Arceo et al. (2020) and Kao et al. (2020) found that psychological resilience and support may buffer the effects of financial strain. This highlights the need for holistic, rather than solely financial, interventions.

Occupational Status

Occupational status (rpb = .363) had a moderate correlation, suggesting that employment plays a significant role in psychological well-being. Lee et al. (2022) reported that unemployment led to substantial QoL declines. Anees et al. (2018) and Cruz-Flores (2023) acknowledged the dual nature of work—offering purpose and financial support but also potential stress. These results affirm that employment status meaningfully influences mental health.

Comorbidities

Comorbidities, while physically impactful, showed a weak correlation with psychological well-being. Cha and Han (2020) emphasized that comorbidities worsen physical and emotional health, yet Gimeno Hernan et al. (2025) found no direct link between comorbidities and psychological well-being, suggesting that personal coping strategies and care quality may be more influential.

Overall, this study supports that education and employment, as social determinants, play a more substantial role in psychological health than other demographic variables. Sajjadi et al. (2024) demonstrated how individualized education improves understanding and psychological outcomes, while Herr et al. (2023) found that meaningful work significantly enhances mental well-being. These findings justify the need for tailored psychosocial interventions that prioritize education, employment support, and individualized care strategies to enhance the mental health of hemodialysis patients.

3.3 Relationship of the Profile of the Respondents to the Environmental Domain

	Environmental Domain	
	Correlation Coefficient	Interpretation
Age	*V*=.114	Weak

Sex	*rpb*=.071	Weak
Educational Attainment	*V*=.278	Weak
Marital Status	*V*=.362	Moderate
Household Income	*V*=.102	Weak
Occupational Status	*rpb*=.321	Moderate
Comorbidities	*V*=.111	Weak

Age

Age had a weak correlation (V=.114), suggesting that environmental factors, such as safety, financial resources, housing conditions, and access to information, were not strong enough to influence overall environmental QoL across all ages significantly. Elsherbiny et al. (2024) noted that the quality of the physical environment was more closely associated with socioeconomic factors and healthcare accessibility than with age. Francis et al. (2024) found that younger individuals are typically at the beginning of their careers, making it harder for them to afford high-quality housing in safe neighborhoods that would support a healthy lifestyle.

Sex

Sex demonstrated a weak correlation (rpb=.071). Riehl-Tonn et al. (2024) found a lower health-related QoL among female patients due to biological and sociocultural vulnerabilities. On the contrary, Almeida et al. (2023) and Romero-Sánchez (2024) noted that environmental QoL improved more through practical changes compared to through sex-based differences. Furthermore, although women may be more biologically sensitive to environmental pollutants, Sułkowski et al. (2024) found that male patients also experienced significant environmental stressors in urban areas. Therefore, environmental QoL seems to be influenced more by external conditions rather than by sex-specific factors.

Educational Attainment

Educational attainment showed a weak correlation (rpb=.278). Wong et al. (2024) state that it does not eliminate barriers such as poor transportation and housing. Additionally, Zhang et al. (2020) found that even individuals with higher education levels can suffer from poor environmental QoL when living in polluted or overcrowded areas. These findings suggest that while education contributes to individual coping skills, structural and socioeconomic barriers have a greater impact on environmental QoL.

Marital Status

A moderate correlation (V=.362) was observed between marital status and environmental QoL. El-Agroudy et al. (2020) found that married individuals reported higher QoL, attributing this to family involvement and logistical assistance. The presence of a supportive spouse can improve treatment adherence and access to environmental resources. Similarly, Molsted et al. (2021) found that married patients often experience enhanced support in

managing treatment routines, accessing healthcare, and ensuring a safe living environment. However, Ravindran et al. (2020) highlighted that some married individuals reported lower QoL due to financial strain and caregiving burdens, whereas single patients experienced fewer familial stressors and more autonomy.

Household Income

Household income displayed a weak correlation (V=.102), suggesting that financial status alone does not determine environmental well-being. While Nuñez (2024) and Arceo et al. (2020) reported that low income impacts treatment adherence, it fails to significantly affect environmental QoL in the current study. The WHOQOL framework highlights that environmental QoL also encompasses non-monetary supports such as community resources and healthcare accessibility. Patients with limited income may offset economic barriers through public health programs and social networks. These findings emphasize that while income affects some aspects of care, it does not singularly dictate patients' perceptions of environmental quality.

Occupational Status

Occupational status showed a moderate correlation (rpb=.321), suggesting that employment status influences access to environmental resources. Anees et al. (2018) found that employed individuals typically benefit from financial stability, social interaction, and structured routines that support health management. A study by Lee et al. (2022) also noted that transitioning from employment to unemployment resulted in a decline in QoL as a result of disrupted financial and healthcare access. These findings underscore the importance of stable employment in facilitating a secure and supportive environment for hemodialysis patients.

Comorbidities

A weak correlation (V=.111) between comorbidities and the environmental domain of QoL. Cha and Han (2020) highlighted that although comorbidities increase the burden of a disease, they are less predictive of environmental QoL, which is influenced more by external infrastructure and support systems. Consequently, even patients with multiple chronic conditions may maintain relatively stable environmental QoL through familial assistance and consistent access to medical care. This highlights the necessity of a dual approach that addresses both clinical and environmental dimensions of care.

IV. CONCLUSION

Based on the results of the study, the occupational status of patients undergoing hemodialysis in the Renal Intensive Care Unit (RICU) of Cebu Doctors' University Hospital (CDUH) emerged as the only sociodemographic factor to have a moderate correlation across all four domains of quality of life (QoL)—physical, psychological, social, and environmental. The findings of this study showed that the occupational status of each patient was a meaningful determinant of their perceived well-being, reflecting the broader role of employment in providing structure, purpose, financial security, and access to resources.

Educational attainment also demonstrated a consistent moderate correlation, particularly in the physical, psychological, and social domains. This highlights the importance of health literacy and informed decision-making in navigating through their chronic illness, chronic kidney disease. Other sociodemographic factors such as age, income, marital status, and comorbidities were found to have weak to moderate correlations depending on the domain, suggesting that these variables still contribute to patient outcomes, albeit to a lesser extent.

These results reinforce the multifaceted nature of quality of life among individuals living with chronic kidney disease and undergoing hemodialysis. Patients face a complex interplay of physical limitations, emotional stressors, financial burdens, and varying degrees of social and environmental support. In response to these findings, the development of a website offering specific, evidence-based interventions tailored to the identified sociodemographic challenges aims to assist healthcare providers in better managing and supporting the quality of life of hemodialysis patients.

The findings of this study may serve as a foundation for strengthening patient support systems through accessible digital tools. By bridging clinical insight with sociodemographic understanding, the proposed website can aid in improving patient engagement, guiding personalized care strategies, and ultimately promoting better well-being among CKD patients undergoing hemodialysis.

References

Abun, D., Asuncion, S. B., Lazaro, J. R., Magallanes, T., & Nimfa, C. C. (2021). The effect of educational attainment, length of work experience on the self-efficacy of teachers and employees. International Journal of Business Ecosystem and Strategy (2687-2293), 3(2), 16–28. https://doi.org/10.36096/ijbes.v3i2.258

Alshammari, B., Alkubati, S. A., Awatif Alrasheeday, Eddieson Pasay-An, J. Silvia Edison, Madkhali, N., Al-Sadi, A. K., Maha Salem Altamimi, Sahar Obeid Alshammari, Alshammari, A. A., & Farhan Alshammari. (2024). Factors influencing fatigue among patients undergoing hemodialysis: a multi-center cross-sectional study. Libyan Journal of Medicine, 19(1). https://doi.org/10.1080/19932820.2023.2301142

Alshelleh, S., Alhouri, A., Taifour, A., Abu-Hussein, B., Alwreikat, F., Abdelghani, M., Badran, M., Al-Asa'd, Y., Alhawari, H., & Oweis, A. O. (2022). Prevalence of depression and anxiety with their effect on quality of life in chronic

kidney disease patients. Scientific Reports, 12(1). https://doi.org/10.1038/s41598-022-21873-2

Alma, M. A., Van Der Mei, S. F., Brouwer, S., Hilbrands, L. B., Van Der Boog, P. J. M., Uiterwijk, H., Waanders, F., Hengst, M., Gansevoort, R. T., & Visser, A. (2022). Sustained employment, work disability and work functioning in CKD patients: a cross-sectional survey study. Journal of Nephrology, 36(3), 731–743. https://doi.org/10.1007/s40620-022-01476-w

Anees, M., et al. (2018). Socio-economic factors affecting quality of life of Hemodialysis patients and its effects on mortality. Pak J Med Sci, 34(4), 811-816. https://doi.org/10.12669/pjms.344.15284

Arceo, E., et al. (2020). A review of the quality of life of hemodialysis, breast cancer, and type 2 diabetes mellitus patients. SN Comprehensive Clinical Medicine, 2(2), 149-157. https://doi.org/10.1007/s42399-020-00222-2

Bay, S. S., Kamaruzaman, L., Mohd, R., & Shah, S. A. (2024). Work disability and employment status among advanced chronic kidney disease patients. PLoS ONE, 19(3), e0297378. https://doi.org/10.1371/journal.pone.0297378

Bakker, W., et al. (2024). Educational level and gender are associated with emotional well-being in a cohort of Dutch dialysis patients. Nephrology Dialysis Transplantation, 39(Supplement_1). https://doi.org/10.1093/ndt/gfae069.811

Behlouli, H., Gantar, T., & Ahmed, S. B. (2024). Sex and gender differences in health-related quality of life in individuals treated with incremental and conventional hemodialysis. Clinical Kidney Journal, 17(10). https://doi.org/10.1093/ckj/sfae273

Butt, M., Ong, S., Butt, F., Sajjad, A., Rasool, M., Imran, I., Ahmad, T., Alqahtani, F., & Babar, Z. (2022). Assessment of health-related quality of life, medication adherence, and prevalence of depression in kidney failure patients. International Journal of Environmental Research and Public Health, 19(22), 15266. https://doi.org/10.3390/ijerph192215266

CEIC. (2018). Philippines PH: Educational Attainment: At Least Master's or Equivalent: Population 25+ Years: Male: % Cumulative. Ceicdata.com; CEICdata.com. https://www.ceicdata.com/en/philippines/education-statistics/ph-educational-attainment-at-least-masters-or-equivalent-population-25-years-male--cumulative

Cha, J., & Han, D. (2020). Health-Related Quality of Life Based on Comorbidities Among Patients with End-Stage Renal Disease. Osong Public Health and Research Perspectives, 11(4), 194–200. https://doi.org/10.24171/j.phrp.2020.11.4.08

Cheung, K. L., & LaMantia, M. A. (2019). Cognitive impairment and mortality in patients receiving hemodialysis: Implications and future research avenues. American Journal of Kidney Diseases, 74(4), 432-437.

https://doi.org/10.1053/j.ajkd.2019.06.002

Copeland, L. (2023, March 9). KFF report highlights state differences in access to Medicare's Low-Income programs. Medicare Rights Center. https://www.medicarerights.org/medicare-watch/2022/04/21/kff-report-highlights-state-differences-in-access-to-medicares-low-income-programs

Cruz-Flores, M. A. C. (2023). Employment status and coping strategies of renal patients on hemodialysis. MOJ Public Health, 12(2), 88–93. https://doi.org/10.15406/mojph.2023.12.00415

El-Agroudy, A., et al. (2020). Quality of life and its determinants among hemodialysis patients. Saudi Journal of Kidney Diseases and Transplantation, 31(2), 460. https://doi.org/10.4103/1319-2442.284022

Elsherbiny, M., Almuhanna, S., Alathel, R., Alzahrani, Y., Alshathri, F., Hussamuldin, A., Alherz, A., & Abdalla, S. (2024). Quality of life and complications among hemodialysis patients. Cureus. https://doi.org/10.7759/cureus.71086

Francis, A., Harhay, M. N., Ong, A. C. M., Tummalapalli, S. L., Ortiz, A., Fogo, A. B., Fliser, D., Roy-Chaudhury, P., Fontana, M., Nangaku, M., Wanner, C., Malik, C., Hradsky, A., Adu, D., Bavanandan, S., Cusumano, A., Sola, L., Ulasi, I., & Jha, V. (2024). Chronic kidney disease and the global public health agenda: an international consensus. Nature Reviews Nephrology, 20(7), 473–485. https://doi.org/10.1038/s41581-024-00820-6

Hernan, V. G., et al. (2025). Quality of life and perceived care of patients in advanced chronic kidney disease consultations. arXiv.org. https://arxiv.org/abs/2501.01198

Herr, R. M., et al. (2023). The longitudinal directional associations of meaningful work with mental well-being. BMC Psychology, 11(1). https://doi.org/10.1186/s40359-023-01308-x

Hao, J., et al. (2024). Analysis of influencing factors on quality of life in patients with chronic kidney disease undergoing maintenance haemodialysis. Heliyon, e25817. https://doi.org/10.1016/j.heliyon.2024.e25817

Hanspal, I., Fathima, F., & Kedlaya, P. (2021). Social impact of end-stage renal disease requiring hemodialysis among patients with type-2 diabetes and their caregivers in Bengaluru, Karnataka. Indian Journal of Community Medicine, 46(4), 626. https://doi.org/10.4103/ijcm.ijcm_995_20

Hahr, A. J., & Molitch, M. E. (2021). Management of diabetes mellitus in patients with chronic kidney disease. Clinical Diabetes and Endocrinology, 7(1), 3. https://doi.org/10.1186/s40842-021-00116-4

Indarti, E. T., & Ambarwati, T. (2023). The Correlation Self-Acceptance and Compliance Haemodialysis Therapy in Patients with Chronic Kidney Disease. *Journal for Research in Public Health*, *5*(1), 1-7. https://jrph.org//

Iqbal, M. S., Iqbal, Q., Iqbal, S., & Ashraf, S. (2021). Hemodialysis as long term treatment: Patients satisfaction and

its impact on quality of life. Pakistan Journal of Medical Sciences, 37(2). https://doi.org/10.12669/pjms.37.2.2747

Kao, Y., et al. (2020). Correlation of sociodemographic profiles with psychological problems among hospitalized patients receiving unplanned hemodialysis. Renal Failure, 42(1), 255–262. https://doi.org/10.1080/0886022x.2020.1736097

Kaufman, M. R., Eschliman, E. L., & Karver, T. S. (2023). Differentiating sex and gender in health research to achieve gender equity. Bulletin of the World Health Organization, 101(10), 666–671. https://doi.org/10.2471/blt.22.289310

Kim, S., Kim, E., & Ryu, E. (2019). Illness perceptions, Self-Care management, and clinical outcomes according to Age-Group in Korean hemodialysis patients. International Journal of Environmental Research and Public Health, 16(22), 4459. https://doi.org/10.3390/ijerph16224459 Sui, W., Huang, P., Zhang, Y., Han, L., Wang, M., & Dai, Y. (2020). Chronic glomerulonephritis and end-stage renal disease: The link and clinical implications. Renal Failure, 42(1), 76–83. https://doi.org/10.1080/0886022X.2019.1707873

Ku, E., Lee, B. J., Wei, J., & Weir, M. R. (2019). Hypertension in CKD: Core curriculum 2019. American Journal of Kidney Diseases, 74(1), 120–131. https://doi.org/10.1053/j.ajkd.2018.11.010

Lee, W.-T., et al. (2022). Analyzing decline in quality of life by examining employment status changes. Annals of Occupational and Environmental Medicine, 34(1). https://doi.org/10.35371/aoem.2022.34.e17

Maharjan, J. (2022). Psychological distress among patients receiving haemodialysis in a teaching hospital. Journal of Patan Academy of Health Sciences, 9(3), 89–96. https://doi.org/10.3126/jpahs.v9i3.52220

Mosleh, H., Alenezi, M., Al Johani, S., Alsani, A., Fairaq, G., and Bedaiwi, R. (2020, January 15). Prevalence and Factors of Anxiety and Depression in Chronic Kidney Disease Patients Undergoing Hemodialysis: A Cross-sectional Single-Center Study in Saudi Arabia. Cureus; 12(1):e6668. doi: 10.7759/cureus.6668. PMID: 31976185; PMCID: PMC6968827

Molsted, S., Wendelboe, S., Flege, M. M., & Eidemak, I. (2021). The impact of marital and socioeconomic status on quality of life and physical activity in patients with chronic kidney disease. International Urology and Nephrology, 53(12), 2577–2582. https://doi.org/10.1007/s11255-021-02826-6

Nagy, E., et al. (2023). Anxiety and depression in maintenance hemodialysis patients. International Urology and Nephrology, 55(11), 2905–2914. https://doi.org/10.1007/s11255-023-03556-7

National Kidney Foundation. Retrieved September 24, 2024, from

https://www.kidney.org/kidney-topics/chronic-kidney-disease-ckd

Nfah-Abbenyi. (2024). Impact of socioeconomic status on access to healthcare services in underserved communities in Cameroon. ajpojournals.org. https://doi.org/10.47672/ajppa.1852

Nkunu, V., Wiebe, N., Bello, A., Campbell, S., Tannor, E., Varghese, C., Stanifer, J., & Tonelli, M. (2022). Update on existing care models for chronic kidney disease in low- and middle-income countries: A systematic review. Canadian Journal of Kidney Health and Disease, 9. https://doi.org/10.1177/20543581221077505

Nuñez, B. D. (2024). Sociodemographic and clinical profile, adherence to treatment, and perceived social support among hemodialysis patients. Malaysian Journal of Nursing, 15(04), 128-138. https://doi.org/10.31674/mjn.2024.v15i04.015

Raghupathi, V., & Raghupathi, W. (2020). The influence of education on health. Archives of Public Health, 78, 20. https://doi.org/10.1186/s13690-020-00402-5

Ravindran, A., et al. (2020). Assessment of quality of life among end-stage renal disease patients undergoing maintenance hemodialysis. Indian Journal of Palliative Care, 26(1), 47. https://doi.org/10.4103/ijpc.ijpc_141_19

Sajjadi, S. L., et al. (2024). The effect of individualized education on learning needs of patients undergoing hemodialysis. BMC Nephrology, 25(1). https://doi.org/10.1186/s12882-024-03886-3

Scholes-Robertson, N., Viecelli, A. K., Tong, A., Carter, S. A., Wyld, M., Sluiter, A., & Manera, K. E. (2023). Let's talk about sex … and CKD. Clinical Journal of the American Society of Nephrology, 18(8), 1092-1094. https://doi.org/10.2215/CJN.0000000000000140

Shankar, M., et al. (2024). Gender Disparity in Hemodialysis Practices and Mortality. Indian Journal of Nephrology, 0, 1–8. https://doi.org/10.25259/ijn_559_23

Svendsen, M. T., Bak, C. K., Sørensen, K., Pelikan, J., Riddersholm, S. J., Skals, R. K., Mortensen, R. N., Maindal, H. T., Bøggild, H., Nielsen, G., & Torp-Pedersen, C. (2020). Associations of health literacy with socioeconomic position, health risk behavior, and health status: A large national population-based survey among Danish adults. *BMC Public Health, 20*(1), 565. https://doi.org/10.1186/s12889-020-08498-8

Sułkowski, L., Matyja, A., & Matyja, M. (2024). Social Support and Quality of Life in Hemodialysis Patients: A Comparative Study with Healthy Controls. Medicina, 60(11), 1732–1732. https://doi.org/10.3390/medicina60111732

Tannor, E. K., Chika, O. U., & Okpechi, I. G. (2022). The impact of low socioeconomic status on progression of chronic kidney disease in low- and Lower Middle-Income countries. Seminars in Nephrology, 42(5), 151338.

https://doi.org/10.1016/j.semnephrol.2023.151338

Ravindran, A., Sunny, A., Kunnath, R. P., & Divakaran, B. (2020). Assessment of quality of life among end-stage renal disease patients undergoing maintenance hemodialysis. Indian Journal of Palliative Care, 26(1), 47. https://doi.org/10.4103/ijpc.ijpc_141_19

SunStar Cebu, & SunStar Cebu. (2024, October 15). PhilHealth dialysis coverage: Key changes you need to know. SunStar Publishing Inc. https://www.sunstar.com.ph/cebu/philhealth-dialysis-coverage-key-changes-you-need-to-know?utm_source

Tsirigotis, S., Polikandrioti, M., Alikari, V., Dousis, E., Koutelekos, I., Toulia, G., Pavlatou, N., Panoutsopoulos, G. I., Leftheriotis, D., & Gerogianni, G. (2022). Factors Associated With Fatigue in Patients Undergoing Hemodialysis. Cureus, 14(3). https://doi.org/10.7759/cureus.22994

Todorova, T., & Hristova, T. (2022). Statistical impact of educational attainment on changing the lifestyle of hemodialysis patients. *TEM Journal, 11*(2), 950–954. https://doi.org/10.18421/TEM112-58

Wang, Z., Cheng, Y., Zhang, N., Luo, R., Guo, K., Ge, S., & Xu, G. (2021). Effect of Marital Status on Depression and Mortality among Patients with Chronic Kidney Disease from National Health and Nutrition Examination Survey 2005–2014. Kidney Diseases, 7(5), 391–400. https://doi.org/10.1159/000515440

Yazawa, M., Omae, K., Shibagaki, Y., Inaba, M., Tsuruya, K., & Kurita, N. (2019). The effect of transportation modality to dialysis facilities on health-related quality of life among hemodialysis patients: results from the Japanese Dialysis Outcomes and Practice Pattern Study. *Clinical Kidney Journal*, *13*(4), 640–646. https://doi.org/10.1093/ckj/sfz110

Yolgösteren, A. (2020b). Relationship between hemodialysis patients' educational level and arteriovenous fistula patency. Vascular, 28(5), 604–608. https://doi.org/10.1177/1708538120918417

Zhang, F., Li, D., Ahrentzen, S. et al. Exploring the inner relationship among neighborhood environmental factors affecting quality of life of older adults based on SLR–ISM method. J Hous and the Built Environ 35, 215–242 (2020). https://doi.org/10.1007/s10901-019-09674