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# Subjective Wellbeing Assessment in People with Chronic Kidney Disease Undergoing Hemodialysis

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## Abstract

The aim of this study was to analyze the relationship between satisfaction with life in general and the sociodemographic and emotional factors and components of quality of life in people with chronic kidney disease undergoing hemodialysis. A cross-sectional and correlational study was performed on a sample of 171 people with chronic kidney disease in two hemodialysis units at a Clinic in Lisbon between May and June 2015. Subjective wellbeing (personal wellbeing index) is positively related with subjective happiness, positive affect, and quality of life and is negatively associated with negative affect. Subjective happiness, negative affect, and the physical component of quality of life influence subjective wellbeing. These conclusions can assist us in understanding that people with chronic kidney disease (CKD) encounter greater feelings of wellbeing, mainly related to pleasant affect (subjective happiness and positive affect).

**Keywords:** subjective wellbeing, emotion, quality of life, chronic renal insufficiency, renal dialysis

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## 1. Introduction

Due to its prevalence, chronic kidney disease (CKD) has been recognized as an important public health problem [1].

It has high economic implications in health systems and is also an independent risk factor for cardiovascular disease (CVD) [2]. All six stages of CKD [3] are associated with the increased risk of cardiovascular morbidity, premature mortality, and/or decreased quality of life (QoL) [2, 3].

CKD has an estimated prevalence of 11–13%, mostly related with stage 3 [2]. In the United States in 2012, its prevalence in stages 3–4 was about 6.9% (5.5–8.3) [4]. The adjusted prevalence of CKD in stages 1–5 varied between 3.31% (95% confidence interval [95% CI], 3.30–3.33%) in Norway and 17.3% (IC 95%, 16.5–18.1%) in north eastern Germany [5].

Worldwide, there are about 1.9 million people with CKD undergoing renal replacement therapy [6], namely hemodialysis (HD) or peritoneal dialysis. The first is the most common treatment modality [7].

HD is a treatment method usually performed in hospitals or clinics during 3–4 hours, three times a week [8]. This complex treatment has a high impact on the life of people with CKD. It requires several radical lifestyle changes that affect social and psychological functioning [9] as well as cause pain [7]. Therefore, it is considered a long-term treatment with significant side effects on the physical and mental wellbeing [10].

Health is a state of complete physical, mental, and social wellbeing and not merely the absence of disease or infirmity [11].

People with CKD receiving HD treatment can experience emotional instability and psychological distress, financial burdens, inadequate disease knowledge, and less social support, which influences their QoL [12]. CKD directly interferes in functional capacity, independence, and quality of life [13].

QoL and wellbeing as perceived by people with CKD are important measures of patients' health outcomes [12, 14].

As stated by the World Health Organization, subjective wellbeing (SWB) is considered within the research community as an indicator for the evaluation of QoL [14]. It consists of a range of phenomena that include emotional responses, satisfaction domains, and the judgment about global satisfaction with life. The components of SWB are pleasant affect (e.g., joy, contentment, pride, affection, and happiness), unpleasant affect (e.g., guilt and shame, anxiety and worry, anger, stress, and depression), life satisfaction (e.g., desire to change, satisfaction with current life, past, and future), and a satisfaction domain (e.g., work, family, leisure, health, finances, and self) [15].

A study developed in Indonesia using people with CKD undergoing HD showed that subjective wellbeing is directly related with the positive interpretation of the dialysis process. It also showed that people with CKD have happy feelings and are still able to manage negative emotions that arise. The negative feelings experienced by these people with CKD were anger, sadness, hopelessness, boredom, annoyance, and concern. The positive affects experienced were happiness, pleasure, gratefulness, and optimism [16].

Despite being considered as an important indicator for the QoL in people with CKD undergoing HD, SWB is still underexplored by researchers [17]. Therefore, we found it relevant to explore the sociodemographic and emotional factors that influence the cognitive dimension of the subjective wellbeing, that is to say, the satisfaction with life in general. Therefore, our main goal is to analyze the relationship between satisfaction with life in general and the sociodemographic and emotional factors and components of quality of life.

## **2. Methods**

### **2.1. Study design**

A cross-sectional and correlational study [18], developed in two units of the Diaverum Dialysis Clinic in the Lisbon region, Portugal, with people with CKD undergoing HD between May and June 2015.

### **2.2. Subjects and setting**

The inclusion criteria defined for the population were people undergoing HD routinely for at least 6 months and aged 18 years or over. Exclusion criteria were people with cognitive impairment and active psychiatric illness. Information regarding these conditions was obtained through medical records, 253 people with CKD met the eligibility criteria (139 in clinic 1 and 114 in clinic 2).

A simple random sample of 171 people undergoing HD was selected from the dialysis clinics, 93 of clinic 1 and 78 of clinic 2.

### **2.3. Procedures**

Approval was received from the ethics committees of Diaverum (Approval No 1/2015). Both the purpose of the study and the guaranteed confidentiality of data with the right to withdraw without risk to oneself were explained to the people with CKD. Informed consent was therefore obtained from those who met the inclusion criteria and agreed to participate.

Interviews were performed by five trained nurses during the HD session.

One of the researchers met with these nurses to explain the objectives and how to collect the data, followed by a written roadmap to assist in completing the data collection instruments.

Data were collected through a sociodemographic and health information questionnaire (age, gender, nationality, education, occupation, marital status, dialysis sessions length, presence of hypertension, and diabetes), the subjective happiness scale (SHS) [19–21], the satisfaction with life in general (SWLG), the personal wellbeing index (PWI) [22, 23], the Portuguese version of positive and negative affect schedule (PANAS) [24–26], and the 12-item short form health survey (SF-12) [27, 28].

Retrospective license was obtained for the use of SF-12 (license No QM030904).

## 2.4. Outcomes measurement

The SHS [18] consists of four items; in items two and three, participants are asked to self-characterize themselves compared to their peers in absolute and relative terms. Items one and four correspond to descriptions of happiness and unhappiness. The last item score is reversed. On this scale, respondents are asked to self-characterize within a visual analogue scale with seven positions. The scale is based on two antagonistic statements, which express the level of happiness or lack of it [19, 20]. The Portuguese version in people with CKD shows a single factor with an internal reliability with a Cronbach's  $\alpha$  of 0.90 [21].

The PWI [22] consists of seven domains of the overall measure of life satisfaction (satisfaction with standard of living, health, personal development, personal relationships, sense of security, connection to the community, and security for the future). For each statement, the respondents are asked to classify their satisfaction within a scale from zero (extremely dissatisfied) to 10 (very satisfied) with a neutral intermediate position. The PWI is calculated on a rating ranging from zero to 100 (maximum percentage of the scale) [22, 23]. The Portuguese version in people with CKD revealed the existence of a single factor, with an internal reliability with a Cronbach's  $\alpha$  of 0.82 [23].

The PANAS [24] scale was adapted and translated for the Portuguese population and consists of two subscales: PA and NA, with 10 items each, in which constructs are assessed on a Likert scale of 1–5. The respondents are asked to classify their emotions (for each of the 20 items) at the present time. The PA dimension is much more present than the higher score, a maximum of 50 points [25]. The study of the Portuguese version of PANAS in people with CKD revealed the same as the original scale, the existence of two factors, internal consistency with Cronbach's  $\alpha$  of 0.86 (in the original,  $\alpha = 0.88$ ) for the positive affect and 0.88 (in the original,  $\alpha = 0.87$ ) for the negative affect scale [26].

SF-12 [27] is a health questionnaire developed in the United States of America, validated for several countries, from different continents. It measures the perception of health-related QoL through the use of 12 items with a resumed physical and mental component in which the constructs are evaluated on a Likert type scale from three to five points [27, 28]. The version translated and adapted to Portuguese showed reliability and satisfactory validity [27].

## 2.5. Data analysis

Data were analyzed with descriptive and inferential statistics using the Statistical Package for Social Sciences (SPSS) 20.0 statistical software. Data obtained by SF12 were analyzed using the Quality Metric Health Outcomes™ Scoring Software 4.5. Descriptive statistics are reported as frequency, percentage, mean, and standard deviations, while inferential procedures included Spearman correlation coefficients and multiple linear regression. A 0.05 level of significance was adopted.

### 3. Results

The typical characteristics of participants were male (61%), an average age of 60.2 years old (SD = 14.34). About 80.1% had Portuguese nationality and the remaining were from an African country as follows: Cape Verde 14%; São Tomé 3.5%; Angola 1.8%, and Guinea 0.6%. On what concerns the educational level, 3.6% were illiterate, 42.3% had the 4th grade, 18.5% the 6th grade, 14.9% the 9th grade, 11.8% the 12th grade, and 8.9% have completed higher education. Regarding their marital status, 56.5% were married, 26.5% were single, 11.2% widowers, and 5.8% were divorced. About 76.7% were retired, only 23.3% had a regular professional activity. Concerning health data, the subjects were undergoing HD for about 72.17 months ( $\pm 54.2$ ), 62.1% had hypertension, and 27.1% had diabetes.

Portuguese people with CKD had the higher score for satisfaction with life in general ( $p = 0.015$ ), compared with the remaining population (Cape Verde, São Tomé, Angola, and Guinea).

**Table 1** shows both sociodemographic and clinical factors related with CKD, which are associated to satisfaction with life in general/personal wellbeing index.

Satisfaction with life in general/personal wellbeing index has a mean score of 64.7% ( $\pm 18.2\%$ ). Mean scores for the other variables are as follows: subjective happiness 19.9 ( $\pm 5.9$ ), positive affect 24.9 ( $\pm 8.5$ ), negative affect 14.2 ( $\pm 6.1$ ), physical component summary SF-12 41.1% ( $\pm 9.2\%$ ), and mental component summary SF-12 com 47.2 ( $\pm 10.7\%$ ) (**Table 2**).

**Table 3** shows that the personal wellbeing index is positively correlated with subjective happiness ( $\rho = 0.605$ ,  $p < 0.001$ ), positive affect ( $\rho = 0.328$ ,  $p < 0.001$ ), physical component summary SF-12 ( $\rho = 0.470$ ,  $p < 0.001$ ), and mental component summary SF-12 ( $\rho = 0.319$ ,  $p < 0.001$ ). However, it presents a low negative correlation with the negative affect ( $\rho = -0.161$ ,  $p < 0.05$ ). Higher scores on the personal wellbeing index are associated with higher levels of subjective happiness, positive affect, physical component summary SF-12, and mental component summary SF and lower levels of negative affect.

Subjective happiness shows a significant positive correlation with the positive affect ( $\rho = 0.415$ ,  $p < 0.001$ ), physical component summary SF-12 ( $\rho = 0.326$ ,  $p < 0.001$ ), and mental component summary SF-12 ( $\rho = 0.287$ ,  $p < 0.001$ ). Nevertheless, it shows a lower negative correlation with the negative affect ( $\rho = -0.126$ ,  $p < 0.01$ ). When subjective happiness values increase, positive affect, physical component summary SF-12, and mental component summary SF also increase. Simultaneously, negative affect values decrease.

Positive affect shows a significant positive correlation with the physical component summary SF-12 ( $\rho = 0.190$ ,  $p < 0.01$ ) and a mental component summary SF-12 ( $\rho = 0.166$ ,  $p < 0.01$ ).

Negative affect shows a significant negative correlation with the mental component summary SF-12 ( $\rho = -0.271$ ,  $p < 0.001$ ).



	Satisfaction with life in general/personal wellbeing index	p-Value
<b>Gender</b>		
Male	64.2 ± 18.0	p = 0.779
Female	64.8 ± 18.1	
<b>Age</b>		
Under 63 years	66.5 ± 17.1	p = 0.060
More than 63 years	62.6 ± 18.9	
<b>Nationality</b>		
Portuguese	70.5 ± 15.9	p = 0.015
Other	63.2 ± 18.3	
<b>Professional activity</b>		
Retired	64.4 ± 19.0	p = 0.364
Active	66.8 ± 15.4	
<b>Marital status</b>		
Single	67.4 ± 18.2	p = 0.134
Married	64.9 ± 17.5	
Other	59.5 ± 18.9	
<b>Arterial hypertension</b>		
No	67.6 ± 18.1	p = 0.177
Yes	62.9 ± 17.9	
<b>Diabetes</b>		
No	66.0 ± 18.4	p = 0.080
Yes	60.1 ± 16.5	
<b>Hemodialysis time</b>		
Less than 5 years	65.7 ± 17.3	p = 0.937
More than 5 years	63.4 ± 19.0	

**Table 1.** Sociodemographic and clinical factors associated to satisfaction with life in general. Lisbon, Portugal (2017).

The physical component summary SF-12 shows a lower positive correlation with the mental component summary SF-12 ( $\rho = 0.181$ ,  $p < 0.01$ ).

The adjusted  $R^2$  for the model was 46.6% with subjective happiness, negative affect, and physical component summary SF-12 that consistently contributed as best predictors of satisfaction with life in general/personal wellbeing index. The resulting  $R^2$  were statistically significant at the  $p < 0.00$  and  $p < 0.05$  levels.

	Range	Minimum	Maximum	Mean	Standard deviation
1. Satisfaction with life in general/personal wellbeing index	0–100	6.3	100	64.7	18.2
2. Subjective happiness	4–28	4	28	19.9	5.9
3. Positive affect	10–50	10	44	24.9	8.5
4. Negative affect	10–50	10	40	14.2	6.1
5. Physical component summary SF-12	0–100	17.3	63.2	40.1	9.2
6. Mental component summary SF-12	0–100	21.6	66.1	47.2	10.7

**Table 2.** Mean and standard deviation for the different variables. Lisbon, Portugal (2017).

	1	2	3	4	5	$\beta$	t
Constant							1.035
1. Satisfaction with life in general/personal wellbeing index							
2. Subjective happiness	0.605‡					0.426	6.422‡
3. Positive affect	0.328‡	0.415‡				0.086	1.378
4. Negative affect	-0.161*	-0.126†	0.084			-0.121	-2.006*
5. Physical component summary SF-12	0.470‡	0.326‡	0.190†	0.100		0.310	5.121‡
6. Mental component summary SF-12	0.319‡	0.287‡	0.166†	-0.271‡	0.181†	0.093	1.520

Sample size = 171, Adjusted R<sup>2</sup> = 0.466, F = 30.637‡

\*Significance  $p < 0.05$ ,  
 †Significance  $p < 0.01$ ,  
 ‡Significance  $p < 0.001$ .

**Table 3.** Regression for personal wellbeing index with other variables and correlations. Lisbon, Portugal (2017).

Both subjective happiness and physical component summary SF-12 have a positive effect on satisfaction with life in general (respectively,  $\beta = 0.426$ ,  $p < 0.001$ ;  $\beta = 0.310$ ,  $p < 0.001$ ). However, negative affect has a negative effect on satisfaction with life in general ( $\beta = -0.121$ ,  $p < 0.05$ ).

## 4. Discussion

This study is aimed at examining the relationship between satisfaction with life in general and the components of quality of life, sociodemographic characteristics, and emotional factors.



Our findings are in line with the literature on the effects of HD on the life of people with CKD and factors associated with reduced wellbeing.

On what concerns sociodemographic factors, differences were only found in people with CKD of a different nationality. This may be explained by cultural differences, as people with CKD from foreign countries may experience social integration difficulties.

The economic level of countries generally influences all indicators of health and quality of life; however, the SWB in higher income countries is affected by other factors such as income inequality, social welfare, individualism, democracy and freedom, social capital, and physical health [29]. These data are reinforced by the results of a study, which report that the economic level of people negatively affects the SWB in both low income and high income countries [30].

As already mentioned, there is a scarcity of literature concerning wellbeing in people with CKD. Our study confirmed lower scores for GWLS in people with CKD ( $64.7 \pm 18.2$ ). Similarly, the Australian study with people with end-stage kidney disease got an average PWI of  $64.7 \pm 19.2$  and of  $74.8 \pm 15.7$  for the general population [17]. Lower SWB may cause adverse health behaviors in people with CKD. In a study involving people living with HIV, it was suggested that reduced SWB increased the risk of medication nonadherence [31]. Future studies should explore the relationship between wellbeing, adherence to medication, food, and physical activity levels. This association can allow the development of individualized interventions that promote wellbeing in the hemodialysed population and impact on other domains of the personal and social life of these people.

The mean scores for all domains of QoL for people with CKD were considerably below the general population norms. Similar results were found in an Irish study on the QoL of people with CKD undergoing HD treatment [32].

Our main finding is that happiness, pleasant affect, physical, and mental components of QoL are significantly higher in people undergoing HD who got higher scores for the personal wellbeing index/satisfaction with life in general. Subjective happiness and physical components of QoL are those that contribute the most for the overall life satisfaction. On the other hand, negative affect has a significant negative association and influences satisfaction with life in general.

The association between quality of life, morbidity, and mortality has already been explored in previous studies [17]. Chida and Steptoe [33] described SWB as a significant and independent variable predicting increased survival times in CKD. Our study shows the importance of evaluating the components of SWB in people with CKD undergoing HD treatment. It allows us to examine the influence of both emotional components (subjective happiness and negative affect) and physical components of QoL, in cognitive dimension of SWB (satisfaction with life in general/personal wellbeing index).

#### **4.1. Limitations**

There are some limitations in this study. Our results are based on a cross-sectional design that may limit the discussion of a cause-effect relationship between SWB and the variables.

Also, both clinics involved in the study are in the same region influencing sociodemographic characteristics and preventing the generalization of conclusions. Data collection environment (HD room) can lead to distraction in people with CKD. However, others studies [34, 35] were conducted in the same conditions, which do not seem to affect the results. Questionnaires were self-reported or by interview, so some might have given socially accepted answers that could lead to response bias. Finally, the small sample size might have limited the validity of the results. Therefore, a study with a larger sample might have more statistical meaning in examining associations between variables.

#### 4.2. Implications for practice

Nursing professionals have an important role in the promotion of wellbeing and quality of life. The SWB measured by the PWI is an important element in QoL [17]. This study results suggest that people with CKD with higher levels of subjective happiness and quality of life (mental and physical component) also have higher levels of SWB. Thus, these results may help future interventions related to the wellbeing of people with CKD, aimed at improving nurse training for the identification and monitoring of these dysfunctional behaviors. Nurses will be boosted to optimize patient health outcomes.

Depressive symptoms in people with CKD are associated with decreased quality of life [36] and decreased wellbeing [17]. Dialysis nurses should therefore be encouraged to increase people with CKD's happiness through the integration of laughter yoga [37], the Fordyce's happiness program [38], and the visualization of humor films [39], during dialysis sessions. This intervention will improve both people with CKD's wellbeing and health outcomes, such as quality of life, affect, and depressive symptoms.

### 5. Conclusion

Our results show that SWB (personal wellbeing index) is positively related with subjective happiness, positive affect, and quality of life and is negatively associated with negative affect. Subjective happiness, negative affect, and the physical component of quality of life influence SWB. These conclusions can assist us in understanding that people with CKD encounter greater feelings of wellbeing, mainly related to pleasant affect (subjective happiness and positive affect).

This study has confirmed that SWB is lower in people with CKD than in the general population, though this is partly explained by the negative affect. However, SWB increases when both subjective happiness perception and quality of life increase. These conclusions can assist us in understanding that people with CKD encounter higher feelings of wellbeing, not only related to pleasant affect (subjective happiness and positive affect) but also to many other aspects of QoL.

Future studies should be performed in people undergoing HD that demonstrate the effect of interventions on cognitive and emotional variables of the SWB, as is the case of the visualization of humor films.

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