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# KVALITET ŽIVOTA BOLESNIKA NA HRONIČNOM PROGRAMU HEMODIJALIZE U KLINIČKOM CENTRU CRNE GORE

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**SAŽETAK**

**Uvod/Cilj:** Kvalitet života povezan sa zdravljem (engl. *Health Related Quality of Life*, HRQoL) predstavlja jedan od niza važnih prediktora smrtnog ishoda i hospitalizacije osoba na hemodijalizi (HD) usled terminalne bubrežne insuficijencije. Cilj ovog istraživanja je da se proceni HRQoL obolelih u terminalnoj fazi hronične bubrežne insuficijencije koji se leče HD u Centru za hemodijalizu Kliničkog centra Crna Gora (KCCG).
**Metode:** Studijom preseka obuhvaćeno je 43 ispitanika sa terminalnom fazom hronične bubrežne insuficijencije koji su bili na HD tokom januara 2025. godine u Centru za hemodijalizu KCCG. Podaci od ispitanika su prikupljeni opštim i standardizovanim anonimnim upitnikom *Kidney Disease Quality of Life Short Form* (KDQOL-SF™) (srpska verzija). U cilju analize podataka korišćen je Pearsonon koeficijent korelacije.
**Rezultati:** Postoji značajna negativna korelacija između doživljaja uspešnosti i zadovoljstva sa zaokupljenošću bubrežnom bolešću prilikom obavljanja svakodnevnih aktivnosti ($r = -0,45$; $p < 0,001$). Zadovoljstvo lečenjem lica na HD je manje što je veći uticaj bubrežne bolesti na život bolesnika ($r = -0,47$; $p < 0,001$). Više je problema u seksualnom funkcionisanju što je veći uticaj bolesti na psihičko stanje ($r = 0,54$; $p < 0,001$), kao i kada je veća zaokupljenost osobe bolešću tokom obavljanja svakodnevnih životnih aktivnosti ($r= 0,67$; $p <0,001$) i kada je veći uticaj bubrežne bolesti na život ($r = 0,46$; $p < 0,001$).
**Zaključak:** Neophodna su dalja istraživanja u ovoj oblasti u cilju sagledavanja kvaliteta života osoba sa hroničnim bubrežnim oboljenjima koji su na HD u odnosu na demografske i kliničke parametre, kao i u cilju identifikacije nezavisnih prediktora kvaliteta života.

**Ključne reči:** terminalna bubrežna insuficijencija, hronična bubrežna bolest, kvalitet života, hemodijaliza

## Uvod

U svetu, poslednjih decenija životni vek ljudi je sve duži, pa je stim u vezi došlo i do povećanja globalnog broja starijih osoba sa hroničnim nezaraznim bolestima, kao što su hipertenzija, dijabetes melitus i druge autoimune bolesti koje doprinose razvoju hronične bolest bubrega (1,2). Završni stadijum hronične bubrežne bolesti dovodi do terminalne bubrežne insuficijencije koja zahteva hitnu medicinsku intervenciju u vidu hemodijalize, peritoneumske dijalize i transplantacije bubrega. Svaka od navedenih terapija utiče na kvalitet života povezan sa zdravljem (engl. *Health Related Quality of Life*, HRQoL)(3).

Svetska zdravstvena organizacija (SZO) naglašava da HRQoL predstavlja „individualnu procenu bolesnika o tome koliko bolest i primenjena terapija utiču na njegov psihofizički, socijalni i emocionalni osećaj „dobrog“ (6). Istraživanja sugerišu da bolesnici na HD često prijavljuju niži nivo kvaliteta života u odnosu na one koji su na peritoneumskoj dijalizi ili su podvrgnuti transplantaciji. Takođe, HRQoL je pouzdan prediktor smrtnog ishoda i hospitalizacije bolesnika na HD (4,5). Cilj svakog lečenja osoba u terminalnoj fazi hronične bubrežne insuficijencije je da doprinese povećanju HRQoL (6,7). Osobe na HD, u odnosu na opštu populaci-

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# QUALITY OF LIFE OF PATIENTS ON CHRONIC HEMODIALYSIS PROGRAM IN THE CLINICAL CENTER OF MONTENEGRO

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**SUMMARY**

**Introduction/Aims:** Health-related quality of life (HRQoL) is one of the key predictors of mortality and hospitalization in patients undergoing hemodialysis (HD) due to terminal kidney failure. The aim of our study was to examine the HRQoL of individuals with terminal chronic kidney disease who are undergoing HD at the Hemodialysis Center of the Clinical Center of Montenegro (CCM).
**Methods:** A cross-sectional study included 43 participants with terminal chronic kidney disease who were on HD during January 2025 at the Hemodialysis Center of CCM. Data were collected from participants using a general and standardized anonymous questionnaire, the Kidney Disease Quality of Life Short Form (KDQOL-SF™) (Serbian version). Pearson's correlation coefficient was used for data analysis.
**Results:** There is a significant negative correlation between the perception of success and satisfaction with the impact of kidney disease on daily activities ($r = -0.45$; $p < 0.001$). Satisfaction with treatment in HD patients is lower when the impact of kidney disease on their lives is greater ($r = -0.47$; $p < 0.001$). Sexual functioning issues are more pronounced when the impact of the disease on mental health is greater ($r = 0.54$; $p < 0.001$), as well as when there is more preoccupation with the disease during daily activities ($r = 0.67$; $p < 0.001$) and when the impact of kidney disease on life is greater ($r = 0.46$; $p < 0.001$).
**Conclusion:** Further research is needed in this area to assess the quality of life of individuals with chronic kidney disease undergoing HD in relation to demographic and clinical parameters, as well as to identify independent predictors of quality of life.

**Keywords:** terminal kidney failure, chronic kidney disease, quality of life, hemodialysis

## Introduction

Global life expectancy has increased around the world in recent decades, with the resulting increase in the global number of elderly persons with chronic non-infectious diseases, such as hypertension, diabetes mellitus and other autoimmune diseases, which contribute to the development of chronic kidney disease (1,2). The end-stage chronic kidney disease leads to end-stage kidney failure which requires urgent medical intervention, including hemodialysis, peritoneal dialysis and kidney transplant. Each of the mentioned treatments affects the Health Related Quality of Life (HRQoL) (3).

The World Health Organization (WHO) emphasizes that HRQoL represents "the individual assessment of how disease and treatment affect the patient's sense of psychological, physical, social and emotional well-being" (6). Studies have suggested that patients receiving HD often report a lower level of quality of life in comparison to those patients receiving peritoneal dialysis (PD) or kidney recipients. Also, HRQoL is a reliable predictor of mortality and hospitalization in HD patients (4,5). The goal of any treatment for patients with end-stage kidney failure is to contribute to an increase in HRQoL (6,7). Patients receiving HD, compared

ju, imaju značajno niži HRQOL (7,8). Stoga, adekvatna terapija i individualni pristupi u zbrinjavanju pacijenata sa terminalnom hroničnom bubrežnom insuficijencijom su od suštinskog značaja za poboljšanje njihovog HRQoL (7,8). HD je sama po sebi povezana s dužom hospitalizacijama i postojanjem brojnih simptoma: nesanica, umor, slab apetit, depresivno ili anksiozno ponašanje, podhranjenost, seksualna disfunkcija i poremećaj libida (9). Cilj ovog istraživanja je bio da se proceni HRQoL obolelih u terminalnoj fazi hronične bubrežne insuficijencije koji se leče HD u Centru za hemodijalizu, Kliničkog Centra Crne Gore (KCCG).

## Metode

Studijom preseka je obuhvaćeno 43 ispitanika u terminalnoj fazi hronične bubrežne insuficijencije koji su bili na HD tokom januara 2025. godine u Centru za hemodijalizu, KCCG. Osobe na HD su popunile opšti (pol, uzrast, obrazovanje, dužina trajanja HD, komorbiditeti, hospitalizacija tokom poslednjih 12 meseci) i standardizovani anonimni upitnik *Kidney Disease Quality of Life Short Form* (KDQOL-SF™)" (srpska verzija) (10). KDKOL-SF je alat za samoprocenu kvaliteta života osoba sa oboljenjem bubrega i za one na dijalizi. Ova kraća verzija alata uključuje 43 stavke usmerene na bubrežne bolesti, kao što su efekti bolesti na aktivnosti svakodnevnog života, radni status i društvene interakcije, kao i 36 stavki koje obezbeđuju meru fizičkog i mentalnog zdravlja, i jedna stavka ukupne zdravstvene ocene u rasponu od 0 („najgore moguće zdravlje") do 10 („najbolje moguće zdravlje."). Za popunjavanje upitnika od 80 stavki neophodno je oko 16 minuta. Svi ispitanici su pre popunjavanja upitnika potpisali informativni pristanak za učešće u studiji. Istraživanje je odobreno od strane Klinike za nefrologiju, KCCG 16.01.2024. godine (broj: 03/01-820). U cilju analize podataka korišćena je proporcija, Pirsonov koeficijent korelacije i univarijantna regresiona analiza.

## Rezultati

Studijom preseka je obuhvaćeno 43 ispitanika (22 muškarca i 21 žena) koja su na hroničnom programu HD u Centru za dijalizu KCCG u Podgorici. Najveći broj ispitanika je bilo uzrasta 51-60 godina (39,5%) i 61 i više godina (39,5%), a najmanje u uzrastu 50 i manje godina (21,0%). Visoko i više obrazovanje je imalo 9,3% ispitanika, srednje 65,1%, a osnovno 16,3%. Kada je u pitanju dužina lečenja HD, 28 (65,1%) ispitanika se lečila između jedne i pet godina, 12 (27,9%) između šest i deset godina, a troje (7,0%) duže od deset godina. Najčešće ispitanici su imali od komorbiditeta hipertenziju (32,6%) i policističnu bolest bubrega (20,9%), a zatim hronični glomerulonefritis (14%) i ostale bolesti (14,0%) (dijabetes, hronični pijelonefritis, nepoznato). Svi ispitanici su bili bar jednom hospitalizovani tokom poslednjih 12 meseci.

Analiza kvaliteta života u vezi sa sveukupnim zdravljem pokazuje da sveukupno zdravlja značajno negativno korelira sa strahom za zdravlje ($r = -0,60$; $p < 0,001$), ograničenošću u obavljanju svakodnevnih aktivnosti ($r = -0,56$; $p < 0,001$) i društvenog funkcionisanja ($r = -0,54$; $p < 0,001$) (Tabela 1). Takođe, osobe koje više strahuju za svoje zdravlje imaju manje kvalitetan san ($r=-0,36$; $p = 0,02$), a više se žale na otežano socijalno funkcionisanje ($r = 0,59$; $p < 0,001$), otežano obavljanje svakodnevnih aktivnosti ($r = 0,64$; $p < 0,001$) i otežano obavljanje posla usled prisustva telesnog bola ($r = 0,38$; $p = 0,01$). Visoka je i značajna pozitivna korelacija između teškoća u obavljanju svakodnevnih aktivnosti i teškoća u učestvovanju u socijalnim/društvenim aktivnostima ($r = 0,70$; $p < 0,001$), a obe ove varijable značajno pozitivno koreliraju sa smetnjama u obavljanju radnih zadataka usled telesnog bola ($r = 0,47$; $p < 0,001$ i $r = 0,54$; $p<0,001$), dok značajno negativno koreliraju sa kvalitetom sna ($r = -0,51$; $p < 0,001$ i $r = -0,39$; $p = 0,01$). Pokazalo se da prisustvo telesnog bola značajno pozitivno korelira sa otežanim obavljanjem svakodnevnih aktivnosti ($r = 0,33$; $p = 0,04$) i obavljanje poslova ($r = 0,82$; $p < 0,001$). Zadovoljstvo vremenom koje ispitanici provode sa porodicom i prijateljima značajno pozitivno korelira sa zadovoljstvom vezanim za porodičnu podršku ($r = 0,74$; $p < 0,001$), a obrnuto sa otežanim društvenim funkcionisanjem ($r=-0,45$; $p < 0,001$). Zadovoljstvo porodičnom podrškom značajno negativno korelira sa otežanim obavljanjem svakodnevnih aktivnosti ($r = -0,33$; $p = 0,04$).

Analiza kvaliteta života u odnosu na bubrežnu bolest pokazuje da postoji značajna negativna korelacija između doživljaja uspešnosti i zadovoljstva i zaokupljenošću bubrežnom bolešću prilikom obavljanja svakodnevnih aktivnosti ($r = -0,45$; $p < 0,001$) (Tabela 2). Što je veći uticaj bubrežne bolesti na život pacijenta, to je značajno veći uticaj na njihovo psihičko stanje ($r = 0,46$; $p<0,001$), značajno veća je njegova zaokupljenost bolešću prilikom obavljanja svakodnevnih aktivnosti ($r = 0,64$; $p <$

to the general population, have significantly lower HRQoL (7,8). Therefore, adequate treatment and individual approach in the healthcare of patients with end-stage kidney failure can contribute to the increase in their HRQoL (7,8). HD itself is associated with longer hospitalization and the existence of numerous symptoms: insomnia, fatigue, poor appetite, depressive or anxious behavior, malnutrition, sexual dysfunction and libido disorder (9). The aim of this study was to assess the HRQoL of patients with end-stage chronic renal disease treated at the Hemodialysis Center of the Clinical Center of Montenegro.

## Methods

The cross-sectional study included 43 respondents with end-stage chronic kidney disease who received hemodialysis during January 2025 at the Hemodialysis Center of the Clinical Center of Montenegro (CCM). Patients on HD filled out a general questionnaire (gender, age, education, duration of HD, comorbidities, hospitalization during the last 12 months) and a standardized anonymous questionnaire Kidney Disease Quality of Life Short Form (KDQoL-SFTM) (Serbian version) (10). KDQoL-SF is a tool for the self-assessment of the quality of life of patients with kidney disease and those on dialysis. This shorter version of the tool includes 43 items focused on kidney diseases, such as the impact of disease on daily activities, work status and social interactions, as well as 36 items that provide a measure of physical and mental health, and one item related to overall health score ranging from 0 ("worst possible health") and 10 ("best possible health"). It takes about 16 minutes to complete the questionnaire consisting of 80 items. All participants signed informed consent for participation in the study before they filled out the questionnaire. The study was approved by the Clinic for Nephrology, CCM on January 16th, 2024 (number: 03/01-820). Proportion, Pearson's correlation coefficient and the analysis of variance were used for the analysis of data.

## Results

The cross-sectional study included 43 respondents (22 men and 21 women) who were on the chronic HD program at the Hemodialysis Center of CCM in Podgorica. The largest number of respondents were aged 51-60 years (39.5%) and 61 and over (39.5%), while the least of them were in the age group 50 and younger (21.0%). 9.3% of respondents had a higher education, 65.1% had high school education and 16.3% had primary education. When it comes to the duration of HD treatment, 28 (65.1%) of respondents were treated between one and five years, 12 (27.9%) between six and ten years, and three (7.0%) longer than ten years. The respondents most frequently had the following comorbidities: hypertension (32.6%), polycystic kidney disease (20.9%), followed by glomerulonephritis (14%) and other diseases (14%) (diabetes, chronic pyelonephritis, unknown). All respondents were hospitalized at least once during the last 12 months.

The analysis of the quality of life in relation to overall health shows that there is a significant negative correlation between overall health and fear for their health ($r = -0.60$; $p < 0.001$), limitations in performing daily activities ($r = -0.56$; $p < 0.001$) and social functioning ($r = -0.54$; $p < 0.001$) (Table 1). Also, persons who fear more for their health have poor sleep ($r = -0.36$; $p = 0.02$), and they complain more about poorer social functioning ($r = 0.59$; $p < 0.001$), difficulties regarding performing daily activities ($r = 0.64$; $p < 0.001$), and difficulties regarding functioning in work due to the presence of physical pain ($r = 0.38$; $p = 0.01$). There is a high and significant positive correlation between difficulties related to performing daily activities and difficulties related to participating in social activities ($r = 0.70$; $p < 0.001$), and both of these variables have a significant positive correlation with difficulties related to performing work tasks due to physical pain ($r = 0.47$; $p < 0.001$ and $r = 0.54$; $p < 0.001$), while they have a significant negative correlation with the quality of sleep ($r = -0.51$; $p < 0.001$ and $r = -0.39$; $p = 0.001$). It has been shown that there is a significant positive correlation between the presence of physical pain and difficulties related to performing daily activities ($r = 0.33$; $p = 0.04$) and performing work tasks ($r = 0.82$; $p < 0.001$). Satisfaction with the time respondents spend with family and friends is positively correlated with satisfaction related to family support ($r = 0.74$; $p < 0.001$), and inversely with difficult social functioning ($r = -0.45$; $p < 0.001$). There is a significant negative correlation between satisfaction with family support and limitations in daily activities ($r = -0.33$; $p = 0.04$).

The analysis of the quality of life related to kidney disease shows that there is a significant

**Tabela 1.** Pirsonov koeficijenti korelacija i p - vrednost za različite pokazatelje kvaliteta života u vezi sa celokupnim zdravljem lica na hemodijalizi

| r/p | Procjena koliko je dobro vase sveukupno zdravlje | Koliko strahujete za svoje zdravlje | Koliko je zdravstveno i/ ili emocionalno stanje otežalo društveno funkcionisanje | Koliko ste bili ograničeni u obavljanju svakodnevnih aktivnosti | Prisustvo tjelesne boli | Koliko je bol ometala obavljanje poslova | Ukupni kvalitet spavanja | Zadovoljstvo količinom vremena provedenog sa porodicom i prijateljmima | Zadovoljstvo podrškom koju dobijate od porodice i prijatelja |
|---|---|---|---|---|---|---|---|---|---|
| Procjena koliko je dobro vase sveukupno zdravlje | | -0, 60** <0,001 | -0,56** <0,001 | -0,54** <0,001 | 0,10 0,55 | -0,26 0,10 | 0,26 0,10 | 0,23 0,15 | 0,17 0,23 |
| Koliko strahujete za svoje zdravlje | -0, 60** <0,001 | 1 | 0,59** <0,001 | 0,64** <0,001 | 0,25 0,11 | 0,38* 0,01 | -0,36* 0,02 | -0,24 0,13 | -0,21 0,19 |
| Koliko je zdravstveno i/ ili emocionalno stanje otežalo društveno funkcionisanje | -0,56** <0,001 | 0,59** <0,001 | 1 | 0,70** <0,001 | 0,25 0,11 | 0,54** <0,001 | -0,39* 0,01 | -0,45** <0,001 | -0,27 0,10 |
| Koliko ste bili ograničeni u obavljanju svakodnevnih aktivnosti | -0,54** <0,001 | 0,64** <0,001 | 0,70** <0,001 | 1 | 0,33* 0,04 | 0,47** <0,001 | -0,51** <0,001 | -0,30 0,07 | -0,33* 0,04 |
| Prisustvo tjelesne boli | 0,10 0,55 | 0,25 0,11 | 0,25 0,11 | 0,33* 0,04 | 1 | 0,82** <0,001 | -0,09 0,58 | -0,12 0,47 | -0,15 0,35 |
| Koliko je bol ometala obavljanje poslova | -0,26 0,10 | 0,38* 0,01 | 0,54** 0,00 | 0,47** 0,00 | 0,82** 0,00 | 1 | -0,10 0,52 | -0,08 0,64 | -0,06 0,69 |
| Ukupni kvalitet spavanja | -0,26 0,10 | -0,36* 0,02 | -0,39* 0,01 | -0,51** <0,001 | -0,09 0,58 | -0,10 0,52 | 1 | 0,23 0,16 | 0,03 0,84 |
| Zadovoljstvo količinom vremena provedenog sa porodicom i prijateljmima | 0,23 0,15 | -0,24 0,13 | -0,45** <0,001 | -0,30 0,07 | -0,12 0,47 | -0,08 0,64 | 0,23 0,16 | 1 | 0,74** < 0,001 |
| Zadovoljstvo podrškom koju dobijate od porodice i prijatelja | 0,17 0,23 | -0,21 0,19 | -0,27 0,10 | -0,33* 0,04 | -0,15 0,35 | -0,06 0,69 | 0,03 0,84 | 0,74** <0,001 | 1 |

**korelacija je značajna na nivou 0,01; *korelacija je značajna na nivou 0,05

0,001) i značajno više je problema u njegovom seksualnom funkcionisanju (r = 0,46; p < 0,001), a značajno manje je zadovoljstvo lečenjem na dijalizi (r = -0,47; p < 0,001). Što je veći uticaj bolesti na psihičko stanje to je više problema u seksualnom funkcionisanju (r = 0,54; p < 0,001) i veća je zaokupljenost bolešću tokom obavljanja svakodnenvih aktivnosti (r = 0,67; p < 0,001) i veći je uticaj bubrežne bolesti na život (r = 0,46; p < 0,001). Između problema u seksualnom funkcionisanju i zaokupljenosti bolešću takođe postoji značajna pozitivna korelacija (r = 0,47; p < 0,001), kao i problema u seksualnom funkcionisanju i većeg uticaja bubrežne bolesti na život (r = 0,46; p < 0,001) i psihičko stanje (r = 0,54; p < 0,001). Zadovoljstvo lečenjem na dijalizi je bilo značajno negativno u korelaciji sa uticajem bubrežne bolesti na život osobe (r = -0,47; p < 0,001).

Analizom varijanse nije utvrđena značajna razlika u kvalitetu života osoba na HD u odnosu na pol, starost, obrazovanje, dužinu bolesti i komorbiditete.

## Diskusija

Prema rezultatima našeg istraživanja, celokupno zdravlje osoba sa hroničnom bubrežnom bolešću koje su na HD značajno negativno kore-

**Table 1.** Pearson's correlation coefficient and p value for different indicators of quality of life related to the overall health of persons on hemodialysis

| r/p | Assessment of how good your overall health is | How much fear do you feel for your health | To what extent the health and/or emotional state made social functioning difficult | How limited were you in doing your daily activities | Presence of physical pain | How pain made it hard for you to perform work tasks | Overall sleep quality | Satisfaction with the amount of time spent with family and friends | Satisfaction with support you receive from family and friends |
|---|---|---|---|---|---|---|---|---|---|
| Assessment of how good your overall health is | | -0. 60**<br><0.001 | -0.56**<br><0.001 | -0.54**<br><0.001 | 0.10<br>0.55 | -0.26<br>0.10 | 0.26<br>0.10 | 0.23<br>0.15 | 0.17<br>0.23 |
| How much fear do you feel for your health | -0. 60**<br><0.001 | 1 | 0.59**<br><0.001 | 0.64**<br><0.001 | 0.25<br>0.11 | 0.38*<br>0.01 | -0.36*<br>0.02 | -0.24<br>0.13 | -0.21<br>0.19 |
| To what extent the health and/or emotional state made social functioning difficult | -0.56**<br><0.001 | 0.59**<br><0.001 | 1 | 0.70**<br><0.001 | 0.25<br>0.11 | 0.54**<br><0.001 | -0.39*<br>0.01 | -0.45**<br><0.001 | -0.27<br>0.10 |
| How limited were you in doing your daily activities | -0.54**<br><0.001 | 0.64**<br><0.001 | 0.70**<br><0.001 | 1 | 0.33*<br>0.04 | 0.47**<br><0.001 | -0.51**<br><0.001 | -0.30<br>0.07 | -0.33*<br>0.04 |
| Presence of physical pain | 0.10<br>0.55 | 0.25<br>0.11 | 0.25<br>0.11 | 0.33*<br>0.04 | 1 | 0.82**<br><0.001 | -0.09<br>0.58 | -0.12<br>0.47 | -0.15<br>0.35 |
| How pain made it hard for you to perform work tasks | -0.26<br>0.10 | 0.38*<br>0.01 | 0.54**<br>0.00 | 0.47**<br>0.00 | 0.82**<br>0.00 | 1 | -0.10<br>0.52 | -0.08<br>0.64 | -0.06<br>0.69 |
| Overall sleep quality | -0.26<br>0.10 | -0.36*<br>0.02 | -0.39*<br>0.01 | -0.51**<br><0.001 | -0.09<br>0.58 | -0.10<br>0.52 | 1 | 0.23<br>0.16 | 0.03<br>0.84 |
| Satisfaction with the amount of time spent with family and friends | 0.23<br>0.15 | -0.24<br>0.13 | -0.45**<br><0.001 | -0.30<br>0.07 | -0.12<br>0.47 | -0.08<br>0.64 | 0.23<br>0.16 | 1 | 0.74**<br>< 0.001 |
| Satisfaction with support you receive from family and friends | 0.17<br>0.23 | -0.21<br>0.19 | -0.27<br>0.10 | -0.33*<br>0.04 | -0.15<br>0.35 | -0.06<br>0.69 | 0.03<br>0.84 | 0.74**<br><0.001 | 1 |

*correlation is significant at the 0.05 level; **correlation is significant at the 0.01 level

negative correlation between the experience of success and satisfaction and preoccupation with kidney disease when performing daily activities (r = -0.45; p < 0.001) (Table 2). The impact of kidney disease on the patient's life is greater when the impact on his mental state is greater (r=0.46; p < 0.001), as well as when the preoccupation with the disease when performing daily activities is greater (r = 0.64; p < 0.001), and problems related to sexual functioning are more pronounced (r = 0.46; p < 0.001), while satisfaction with dialysis treatment is significantly lower (r = -0.47; p < 0.001). The impact of the disease on the mental state is greater when problems related to sexual functioning are more pronounced (r = 0.54; p < 0.001), as well as when there is more preoccupation with the disease during daily activities (r = 0.67; p < 0.001), and when the impact of kidney disease on life is greater (r = 0.46; p < 0.001). There is also a significant positive correlation between problems related to sexual functioning and preoccupation with the disease (r = 0.47; p < 0.001), as well as between problems related to sexual functioning and greater impact of kidney disease on life (r =

**Tabela 2.** Pirsonov koeficijent korelacije i p vrednost za različite pokazatelje kvaliteta života u vezi sa bubrežnom bolešću osoba na hemodijalizi

| r/p | Procjena uspješnosti i zadovoljstva | Uticaj bubrežne bolesti na život | Uticaj bubrežne bolesti na psihičko stanje | Zaokupljenost tjelesnim simptomima | Zaokupljenost bubrežnom bolešću u obavljanju svakodnevnih aktivnosti | Problemi u seksualnom funkcionisanju usled bubrežne bolesti | Problemi sa snom | Zadovoljstvo liječenjem na dijalizi |
|---|---|---|---|---|---|---|---|---|
| Procjena uspješnosti i zadovoljstva | 1 | -0,22<br>0,19 | -0,10<br>0,58 | -0,07<br>0,91 | -0,45**<br>0,00 | -0,16<br>0,36 | -0,15<br>0,38 | 0,32<br>0,05 |
| Uticaj bubrežne bolesti na život | -0,22<br>0,19 | 1 | 0,46**<br><0,001 | -0,22<br>0,72 | 0,64**<br><0,001 | 0,46**<br><0,001 | 0,09<br>0,58 | -0,47**<br><0,001 |
| Uticaj bubrežne bolesti na psihičko stanje | -0,10<br>0,58 | 0,46**<br><0,001 | 1 | -0,08<br>0,90 | 0,67**<br><0,001 | 0,54**<br><0,001 | 0,23<br>0,15 | -0,26<br>0,10 |
| Zaokupljenost tjelesnim simptomima | -0,07<br>0,91 | -0,22<br>0,72 | -0,08<br>0,90 | 1 | 0,07<br>0,91 | -0,43<br>0,47 | 0,58<br>0,31 | -0,67<br>0,22 |
| Zaokupljenost bubrežnom bolešću u obavljanju svakodnevnih aktivnosti | -0,45**<br>0,00 | 0,64**<br><0,001 | 0,67**<br><0,001 | 0,07<br>0,91 | 1 | 0,47**<br><0,001 | 0,19<br>0,23 | -0,24<br>0,13 |
| Problemi u seksualnom funkcionisanju usled bubrežne bolesti | -0,16<br>0,36 | 0,46**<br><0,001 | 0,54**<br><0,001 | -0,43<br>0,47 | 0,47**<br><0,001 | 1 | 0,16<br>0,33 | -0,23<br>0,16 |
| Problemi sa snom | -0,15<br>0,38 | 0,09<br>0,58 | 0,23<br>0,15 | 0,58<br>0,31 | 0,19<br>0,23 | 0,16<br>0,33 | 1 | -0,09<br>0,58 |
| Zadovoljstvo liječenjem na dijalizi | 0,32<br>0,05 | -0,47**<br><0,001 | -0,26<br>0,10 | -0,67<br>0,22 | -0,24<br>0,13 | -0,23<br>0,16 | | 1 |

**korelacija je značajna na nivou 0,01; *korelacija je značajna na nivou 0,05

lira sa strahom za svoje zdravlje, zdravstvenim/emocionalnim stanjem koje je otežalo društveno funkcionisanje i ograničenjima u obavljanju svakodnevnih aktivnosti. Prisustvo telesne boli visok značajno pozitivno korelira sa ometanjem u obavljanju poslova.

Procenjuje se da je najmanje 80% bolesnika sa hroničnom insuficijencijom bubrega na HD (11). HD je jedna od tri vrste terapija koje se sprovode kod osoba sa terminalnom hroničnom bubrežnom insuficijencijom. Veliki broj studija je pokazalo da HD utiče na HRQoL (12,13). U cilju procene kvaliteta života lica na HD mogu se koristiti različiti alati za merenje HRQoL, od opštih do specifičnih. Jedan od specifičnih i najčešće korišćenih alata je KD-QOL-SF upitnik (kratki upitnik za procenu kvaliteta života lica s bubrežnom bolešću) (14,15). Hronična bolest bubrega (HBB) značajno utiče na mnoge aspekte života, zdravlja i dobrobiti bolesnika, što se odražava na njihovu radnu sposobnost, porodicu, radno okruženje i zajednicu u celini (16). Na kvalitet života osoba sa HBB utiču i njihove individualne karakteristike: godine starosti, psihofizičke sposobnosti, dužina trajanja dijalize, prisustvo komorbiditeta i socijalni status (16). Sistematski pregled je pokazao da su neke karakteristike ličnosti (neuroticizam, majstorstvo/uspešnost, optimizam i osećaj koherentnosti) češće bile konzistentno povezane sa psihosocijalnim aspektima nego fizičkim aspektima HRQoL (16,17). Mnoge studije su ukazale da je vreme provedeno na dijalizi u pozitivnoj korelaciji s opterećenjem bolesnika simptomima bolesti (18-20). Umor je obično posledica anemije kod bubrežne insuficijencije, a javlja se kod 80% osoba na dijalizi (19). Često se javlja anoreksija, bol, mučnina, svrab, kratak dah, grčevi mišića, parestezija, osećaj depresije, seksualne poteškoće i poremećaj sna (19). Oni mogu doprineti smanjivanju kvaliteta života lica na dijalizi. U 574 studije, pacijenti na peritonealnoj dijalizi (PD) oce-

**Table 2.** Pearson's correlation coefficient and p value for different indicators of quality of life related to persons with kidney disease on hemodialysis

| r/p | Assessment of success and satisfaction | Impact of kidney disease on life | Impact of kidney disease on mental state | Preoccupation with physical symptoms | Preoccupation with kidney disease in performing daily activities | Sexual functioning issues related to kidney disease | Sleep problems | Satisfaction with dialysis treatment |
|---|---|---|---|---|---|---|---|---|
| Assessment of success and satisfaction | 1 | -0.22<br>0.19 | -0.10<br>0.58 | -0.07<br>0.91 | -0.45**<br>0.00 | -0.16<br>0.36 | -0.15<br>0.38 | 0.32<br>0.05 |
| Impact of kidney disease on life | -0.22<br>0.19 | 1 | 0.46**<br><0.001 | -0.22<br>0.72 | 0.64**<br><0.001 | 0.46**<br><0.001 | 0.09<br>0.58 | -0.47**<br><0.001 |
| Impact of kidney disease on mental state | -0.10<br>0.58 | 0.46**<br><0.001 | 1 | -0.08<br>0.90 | 0.67**<br><0.001 | 0.54**<br><0.001 | 0.23<br>0.15 | -0.26<br>0.10 |
| Preoccupation with physical symptoms | -0.07<br>0.91 | -0.22<br>0.72 | -0.08<br>0.90 | 1 | 0.07<br>0.91 | -0.43<br>0.47 | 0.58<br>0.31 | -0.67<br>0.22 |
| Preoccupation with kidney disease in performing daily activities | -0.45**<br>0.00 | 0.64**<br><0.001 | 0.67**<br><0.001 | 0.07<br>0.91 | 1 | 0.47**<br><0.001 | 0.19<br>0.23 | -0.24<br>0.13 |
| Sexual functioning issues related to kidney disease | -0.16<br>0.36 | 0.46**<br><0.001 | 0.54**<br><0.001 | -0.43<br>0.47 | 0.47**<br><0.001 | 1 | 0.16<br>0.33 | -0.23<br>0.16 |
| Sleep problems | -0.15<br>0.38 | 0.09<br>0.58 | 0.23<br>0.15 | 0.58<br>0.31 | 0.19<br>0.23 | 0.16<br>0.33 | 1 | -0.09<br>0.58 |
| Satisfaction with dialysis treatment | 0.32<br>0.05 | -0.47**<br><0.001 | -0.26<br>0.10 | -0.67<br>0.22 | -0.24<br>0.13 | -0.23<br>0.16 | | 1 |

*correlation is significant at the 0.05 level; **correlation is significant at the 0.01 level

0.46; $p < 0.001$) and mental state ($r = 0.54$; $p < 0.001$). There is a significant negative correlation between satisfaction with dialysis treatment and the impact of kidney disease on the quality of life ($r = -0.7$, $p < 0.001$).

The analysis of variance did not reveal a significant difference in the quality of life of patients on HD in relation to gender, age, education, duration of disease and comorbidities.

## Discussion

According to the results of our study, there is a significant negative correlation between the overall health of persons with chronic kidney disease receiving HD and fear for their health, as well as the health/emotional state that hindered social functioning and limitations in performing daily activities. There is also a significant positive correlation between the presence of physical pain and limitations in daily activities.

It is estimated that at least 80% of patients with chronic kidney failure are on HD (11). HD is one of three therapies that are administered in patients with end-stage renal failure. A large number of studies have shown that HD affects HRQoL (12,13). In order to assess the quality of life of people on HD, different tools can be used to measure HRQoL, from general to specific. One of the specific and most commonly used tools is KDQOL-SF questionnaire (Kidney Disease Quality of Life – Short Form) (14,15). Chronic kidney disease (CKD) significantly influences many aspects of patient's life, health and well-being, which reflects on their ability to work, on their family, work environment and community as a whole (16). The quality of life of persons with CKD is also influenced by their individual characteristics: age, psychological and physical abilities, duration of dialysis, presence of comorbidities and social status (16). A systematic review has shown that some personality traits (neuroticism, mastery/achievement, optimism and sense of coherence) are more often consistently associated with psychosocial aspects of HRQoL in comparison to physical aspects of

nili su da imaju bolji kvalitet života nego pacijenti na HD (21). Ukupni rezultat HRQoL u studiji Raoofi i saradnika, za pacijente koji su podvrgnuti HD je bio 60,52 (95%CI: 57,79-63,26), a za pacijente na PD 59,61 (95%CI: 41,31-77,91)(22). U istraživanju Jankowska-Polanska-je i saradnika, učestvovalo je ukupno 100 ispitanika na HD, a njihova prosečna starost je bila 57 godina (23). Čak 73,3% njih je prijavilo hospitalizaciju u proteklih godinu dana, a 66,7% čest umor ($p < 0,001$).

Naša studija ukazuje da što je veći uticaj bubrežne bolesti na život pacijenta, to je značajno veći uticaj na njihovo psihičko stanje, a značajno je manje zadovoljstvo lečenjem dijalizom. Postojanje podrše od strane prijatelja/porodice značajno dobrinosi boljem društvenom funkcionisanju.

Brojni istraživači, takođe, navode da su sa kvalitetom života osoba na HD povezani umor i slabost, svrab, grčevi u mišićima, loši životni uslovi, nedostatak socijalne podrške i poremećaj raspoloženja (24,25). Istraživanja su pokazala da pacijenti koji imaju snažnu emocionalnu podršku od porodice i prijatelja imaju niži nivo anksioznosti i depresije. Emocionalna podrška može pomoći pacijentima da se suoče sa stresom povezanim sa bolešću. Društvena podrška može povećati osećaj povezanosti i svrhe kod pacijenata. Osećaj podrške od zajednice ili socijalne mreže može poboljšati opšte mentalno zdravlje osbe na HD. Postoji niz dokaza koji sugerišu da psihosocijalna podrška može pozitivno uticati na fizičko zdravlje pacijenata, smanjujući učestalost hospitalizacija i poboljšavajući biološke markere bolesti. Bolesnici na HD takođe pate od poremećaja spavanja, posebno od poteškoća s kratkim snom i česta noćna buđenja, što rezultira lošim kvalitetom sna, neproduktivnošnju na poslu i nezadovoljstvom socijalnim okruženjem (24-26).

Prema našim rezultatima, osobe na HD imaju značajno više problema u seksualnom funkcionisanju što je veći uticaj bubrežne bolesti na psihičko stanje osobe, kada je značajno veća njihova zaokupljenost bubrežnom bolešću tokom obavljanja svakodnevnih životnih aktivnosti i kada je značajno veći uticaj bubrežne bolesti na život. Istraživaći ističu da što je veći uticaj bubrežne bolesti na život bolesnika, to je veći uticaj na njegovo psihofizičko zdravlje povezano sa kvalitetom života (27-30). Procenjuje se da je seksualna disfunkcija često prisutna među pacijentima koji su na HD. HBB može dovesti do smanjenja libida, erektilne disfunkcije kod muškaraca i smanjenja seksualnog zadovoljstva kod žena. Fizički simptomi (npr. umor, bolovi, slabost) mogu imati ključnu ulogu kod seksualne disfunkcije, kao i smanjenje nivoa hormona (kao što su testosteron i estrogen). HD može uticati na proizvodnju ovih hormona. Anksioznost, depresija i stres zbog bolesti mogu značajno uticati na seksualno zdravlje. Mnogi pacijenti osećaju sram ili stigmu vezano za svoje zdravstveno stanje, što može otežati seksualnu intimnost.

Ističemo da je naša studija sprovedena samo u jednom centru za dijalizu od ukupno 12 centara u Crnoj Gori, što ograničava mogućnost generalizacije zaključaka na sve bolesnike sa hroničnom bubrežnom insuficijencijom koji se leče na HD. Takođe, istraživanje je sprovedeno na malom broju ispitanika, pa su i analizirane podgrupe uključivale jako mali broj ispitanika za analizu. Međutim, rezultati ovog istraživanja, pomažu u unapređenju kvaliteta života lica na HD.

## Zaključak

Celokupno zdravlje osoba na HD je značajno lošije sa većim strahom za svoje zdravlje, sa lošijim društvenim funkcionisanjem i sa više ograničenja za sprovođenje svakodnevnih aktivnosti, a zadovoljstvo lečenjem je značajno manje što je veći uticaj bubrežne bolesti na život osobe. Više je problema u seksualnom funkcionisanju što je veći uticaj bolesti na psihičko stanje osobe na HD, kada je veća njihova zaokupljenost bolešću tokom obavljanja svakodnevnih životnih aktivnosti i kada je veći uticaj bubrežne bolesti na život. Postojanje podrše od strane prijatelja/porodice dobrinosi značajno boljem društvenom funkcionisanju. Neophodna su dalja istraživanja u ovoj oblasti u cilju analize kvaliteta života osoba na HD u odnosu na demografske i kliničke parametre, kao i u cilju identifikacije nezavisnih prediktora kvaliteta života.

## Konflikt interesa

Autori su izjavili da nema konflikta interesa.

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HRQoL (16,17). Many studies have shown that the time spent on dialysis is positively correlated with the patient's burden of disease (18-20). Fatigue is often the consequence of anemia in renal failure, and it occurs in 80% of patients on dialysis (19). Anorexia, pain, nausea, itchy skin, shortness of breath, muscle spasms, paresthesia, feeling of depression, sexual difficulties and sleep disorders commonly occur (19). They can contribute to reducing the quality of life of patients receiving dialysis. In 574 studies, patients receiving peritoneal dialysis (PD) claimed to have a better quality of life than HD patients (21). In a study by Raoofi and associates, the overall HRQoL score for patients on HD was 60.52 (95%CI: 57.79-63.26), and for patients on PD 59.61 (95%CI: 41.31-77.91) (22). In a study by Yankowska-Polanska et al, the total of 100 respondents on HD participated, and their average age was 57 years (23). Even 73.3% of them reported hospitalization in the previous year, while 66.7% of them reported frequent fatigue ($p < 0.001$).

Our study indicates that the impact of kidney disease on the patient's life is greater when the impact on their psychological state is significantly greater, and when patient satisfaction with dialysis treatment is significantly lower. The existence of family/friends support contributes significantly to better social functioning.

Numerous researchers also state that fatigue and weakness, itchy skin, muscle spasms, poor living conditions, lack of social support and mood disorders are associated with the quality of life of patients on HD (24,25). Research has shown that patients who have strong emotional support from family and friends have a lower level of anxiety and depression. Emotional support can help patients cope with the stress associated with the disease. Social support can increase patients' sense of connection and purpose. Support from family or social networks can improve the overall mental health of persons receiving HD. There is a body of evidence which suggest that psychosocial support can positively influence patients' physical health, thus reducing the frequency of hospitalizations and improving biological markers of disease. HD patients also suffer from sleep disorders, especially disorders related to short sleep and frequent night awakenings, resulting in poor sleep quality, unproductive work and dissatisfaction with social environment (24-26).

According to our results, persons receiving HD have significantly more problems related to sexual dysfunction, when the impact of kidney disease on the patient's mental state is greater, when there is more preoccupation with kidney disease during daily activities and when the impact of kidney disease on patient's life is greater. Researchers emphasize that the impact of kidney disease on patient's life is greater when the influence on his psychophysical state related to quality of life is greater (27-30). It is estimated that sexual dysfunction is often present among patients on HD. CKD can lead to decreased libido, erectile dysfunction in men and decreased sexual satisfaction in women. Physical symptoms (e.g. fatigue, pain, weakness) can play a key role in sexual dysfunction, as can a decrease in hormone levels (such as testosterone and estrogen). HD can affect the production of these hormones. Anxiety, depression, and stress caused by disease can significantly influence sexual health. Many patients feel shame or stigma related to their medical condition, which can make sexual intimacy difficult.

Our study was conducted at one dialysis center out of a total of 12 centers in Montenegro, which limits the possibility of generalizing conclusions to all patients with chronic renal failure undergoing HD treatment. Also, the study was conducted on a small number of respondents, and therefore, the analyzed subgroups included a very small number of respondents for analysis. However, the results of this study help to improve the quality of life of persons on HD.

## Conclusion

The overall health of persons on HD is significantly worse when the fear for their own health is greater, social functioning poorer and when there are more limitations in daily activities, while patient satisfaction with treatment is significantly lower when the impact of kidney disease on their lives is greater. Sexual functioning issues are more pronounced when the impact of the disease on mental health is greater, as well as when there is more preoccupation with the disease during daily activities and when the impact of kidney disease on life is greater. The presence of support from friends/family contributes significantly to better social functioning. Further research is needed in this field in order to analyze the quality of life of persons undergoing HD in relation to demographic

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and clinical parameters, as well as to identify the independent predictors of quality of life.

## Competing interests

The authors declared no competing interests.

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