

Pielęgniarstwo w opiece długoterminowej
Kwartalnik międzynarodowy

LONG-TERM CARE NURSING
INTERNATIONAL QUARTERLY

ISSN 2450-8624

tom 5, rok 2020, numer 2, s. 105-118

e-ISSN 2544-2538

vol. 5, year 2020, issue 2, p. 105-118

DOI: 10.19251/pwod/2020.2(2)

Magdalena Strugała¹, A, D, Dorota Talarska¹, A-C, E-F, Tomasz Niewiadomski², B, E,
Małgorzata Dziechciaż³, E, Katarzyna Wojewoda¹, A-C

QUALITY OF LIFE AND FUNCTIONAL STATUS
IN PATIENTS WITH END-STAGE
RENAL DISEASE

Jakość życia i wydolność funkcjonalna pacjentów
ze schyłkową niewydolnością nerek

¹Department of Preventive Medicine, University of Medical Sciences, Poland

²Orthopedics – Rehabilitational Clinical Hospital, University of Medical Sciences, Poland

³State Technical and Economic School, Jarosław, Poland

A – Koncepcja i projekt badania, B – Gromadzenie i/lub zestawianie danych, C – Analiza i interpretacja danych, D – Napisanie artykułu, E – Krytyczne zrecenzowanie artykułu, F – Zatwierdzenie ostatecznej wersji artykułu

Abstract (in Polish):

Cel pracy

Specyfika postępującego przebiegu choroby prowadzi do rozwoju zależności funkcjonalnej, która przyczynia się do późniejszej niepełnosprawności, istotnie wpływa na jakość życia. Celem badań było ustalenie związku między funkcjonowaniem pacjentów leczonych hemodializą a wybranymi czynnikami społeczno-demograficznymi i jakością życia.

Materiał i metody

Badaniami objęto 100 pacjentów w wieku 20–90 lat, którzy byli leczeni hemodializą w stacji hemodializy terenie zachodniej Polski. Średni wiek dla całej grupy wynosił $59,5 \pm 14,4$ lat. Średni czas prowadzenia dializoterapii w badanej grupie wyniósł $44,7 \pm 48,6$ miesięcy. W celu oceny stanu funkcjonalnego pacjentów wykorzystano Indeks Barthel, skalę IADL Lawtona i Kwestionariusz wydolności Karnofsky'ego. Do oceny jakości życia wykorzystano wielowymiarowy instrument – Kwestionariusz Zdrowia specyficzny dla schyłkowej niewydolności nerek.

Wyniki

Za pomocą korelacji współczynnika Spearmana stwierdzono umiarkowane i silne korelacje między poszczególnymi podskalami Kwestionariusza Zdrowia a sprawnością funkcjonalną, mierzoną za pomocą skali ADL, indeksu Barthel, IADL Lawtona i skalą wydajności Karnofsky'ego. Nie było statystycznie istotnej zależności między długością leczenia nerkozastępczego a poszczególnymi skalami w kwestionariuszu zdrowotnym Parfrey i in., a także sprawnością funkcjonalną pacjentów.

Wnioski

Zmienne demograficzne, zwłaszcza płeć i wiek, a w mniejszym stopniu poziom wykształcenia i stan cywilny mają wpływ na wyniki kwestionariusza zdrowotnego właściwego dla schyłkowej niewydolności nerek. Stopień aktywności miał znaczący wpływ na wyniki w zakresie jakości życia.

Abstract (in English):

Aim

The specifics of progressive course of the disease leads to the development of functional dependence which contributes to later disability, significantly influences quality of life. The goal of the research described here was to determine the relationship between the functioning of patients treated with hemodialysis and selected socio-demographic factors and quality of life.

Material and methods

The research included 100 patients in the range 20-90 years of age who were being treated with hemodialysis in a renal replacement facility in the area of western Poland. The average age for the entire group was 59.5 ± 14.4 years of age. The average time spent on dialysis for the group was 44.7 ± 48.6 months. In order to evaluate patients' functional status the Barthel Index, Lawton's IADL and the Karnofsky Performance Status Scale were used. In order to evaluate QOL, the multidimensional instrument – the Health Questionnaire Specific for ESRD was used.

Results

Using the Spearman coefficient correlation moderate and strong correlations were found between particular sub-scales Health Questionnaire Specific for ESRD and functional capacity. There was no statistically significant dependence between the length of renal-replacement therapy and particular scales on the Parfrey et al Health Questionnaire as well as the functional capacity of patients.

Conclusions

Demographic variables, especially sex and age, and to a lesser degree educational level and marital status have an influence on the results of the Health Questionnaire Specific for ESRD. Activity levels had a significant influence on the results in the area of QOL

Keywords (in Polish):

zdolność funkcjonalna, hemodializa, jakość życia.

Keywords (in English):

quality of life, functional ability, hemodialysis.

Received: 2020-01-11

Revised: 2020-01-31

Accepted: 2020-01-31

Final review: 2020-01-31

Short title

Jakość życia, wydolność funkcjonalna i hemodializa

Corresponding author

Magdalena Strugała

email: magdastrugal@onet.eu

Authors (short)

M. Strugała et al.

Introduction

Patients with End-Stage Renal Disease (ESRD), depending on the length of time spent in renal replacement therapy, lose physical fitness and experience a worsening of mental well-being [1,2,3]. A decline in physical activity is common and appears to negatively influence all areas of quality of life, even in younger patients. Maintaining physical fitness and independence is essential for the general welfare of patients as well as for therapy which allows for patient participation in the rehabilitation process [4].

ESRD is a progressive debilitating chronic disease which requires replacing the excretory function of the kidneys through dialysis. Patients undergoing longterm hemodialysis due to a worsening state of physical and mental health have one of the highest incidences of hospitalization and mortality. The specifics of treatment and the progressive course of the disease leads to the development of functional dependence which contributes to later disability, significantly influences quality of life, physical and mental well-being as well as personal and social relationships [5].

Quality of life is inseparably linked with health. It is a multi-dimensional concept which includes physical, social and mental functioning as well as general perception of health. In practice, research on the quality of life and physical functioning of patients with chronic illness makes up an essential contribution to clinical reports. It is also partly an indicator of the usefulness and effectiveness of therapy such as hemodialysis or peritoneal dialysis [6] as well as nursing care. The therapeutic process requires the introduction of changes in lifestyle including in terms of dialysis, diet planning, reduced intake of liquids and maintaining activity levels.

Research so far has shown that the quality of life of patients on dialysis is lower in every area compared with the general population [3]. The most important determinants of QOL among this group of patients are recognized as depression, sleep problems, sexual dysfunction, inconveniences related to the frequency of hemodialysis and co-occurring illnesses [7]. In addition the illness can bring about changes in body image, the presence of arteriovenous fistulas, or an intravenous dialysis catheter which can negatively affect mental well-being. Together these factors cause a lowering of fitness and a worsening of QOL [4].

A survey of the literature reveals that QOL of patients with ESRD is a relatively frequent subject of research due partly to the the high costs of renal replacement therapies such as hemodialysis and kidney

transplantation. The dimensions of QOL are concentrated as much on subjective as objective measures and refer to physical, emotional, social and behavioral aspects. They enrich and complement both the evaluation of general health and the functional abilities of ESRD patients regardless of age. Persons of advanced age are ever more frequently treated with hemodialysis as the research indicates [8] in spite of the objectively low quality of life of ESRD patients, their subjective evaluations of their QOL remain surprisingly high. This poses problems however as despite the increasing frequency of renal failure, only a small number of patients consent to active participation in research.

At present, both in retrospective and prospective research [8,9] an ever higher level of functional abilities and subjective QOL can be observed. This increases the possibility of employment in this group of patients. Vocational counselling, rehabilitation and vocational retraining are important goals of therapy, especially for those below retirement age.

Research from the areas of functional capacity and QOL, including the present research, through the identification of needs can provide information concerning the most appropriate interventions undertaken for ESRD patients. In addition, it can suggest the potential value of subjective clinical measurement of physical and cognitive functioning. While it cannot replace diagnostic examinations it is useful in the area of the optimization of clinical evaluations.

Aim

The goal of the research described here was to determine the relationship between the functioning of patients treated with hemodialysis and selected socio-demographic factors and quality of life.

Materials and method

Participants

The research included 100 patients in the range 20-90 years of age who were being treated with hemodialysis in a renal replacement facility in the area of western Poland.

Questionnaires were collected over a period of 6 months. The study included all those patients over 20 years of age who consented to take part in it and whose mental and physical health allowed for them to take active part in filling out the questionnaire. The average time necessary for conducting an interview with one patient was 15-20 minutes.

Factors of inclusion:

- patients treated by hemodialysis for at least 6 months,
- degree of physical fitness appropriate for filling out the questionnaire,
- co-occurring illness which did not limit mental or physical functioning,
- non-occurrence of cancer.

Ethical consideration

The approval of the institutional Ethical Committee at the University of Medical Sciences Poznań, Poland and written consent of the patients were obtained.

Research instruments

In order to evaluate patients' functional status the Barthel Index, Lawton's IADL and the Karnofsky Performance Status Scale were used. These instruments were adapted and validated for use in Poland.

Barthel Index

This scale makes it possible to analyse the patient's degree of physical independence in activities of daily living (ADL) such as eating, moving around, bathing, dressing and bladder and bowel continence.

Range of the scale 0-100 pts.

In many countries of Western Europe the Barthel Index is used to calculate the level of care needed. It is assumed that the patient's condition is light when the score is 86–100 points, medium-serious with 21–85 points and very serious – at 0–20 points.

In Poland the National Health Fund recognizes 40 points as as the minimum score for long-term care services [10].

IADL Lawton – Brody Scale

This instrument serves to evaluate instrumental activities of daily living (IADL) that make independent functioning possible both inside and outside the home. It encompasses such activities as using the telephone, shopping, cleaning, taking medication, handling money and movement outside the home. It uses a 0-24 point scale. The more points a patient receives the more independent they are [11].

For statistical purposes the following division was used:

- 24-18 pts – able-bodied
- 17-11 – moderately abled
- below 10 pts – significantly disabled

Karnofsky Performance Status Scale

This scale makes it possible to evaluate active abilities and the intensity of patients' symptoms levels. It was created first for oncology patients but at present is used also for other chronic diseases.

The range of the scale is 0-100 points where 100 points indicates complete fitness and 0 points indicates death [12].

In order to evaluate QOL, the multidimensional instrument – the Health Questionnaire Specific for ESRD [13] consisting of five previously validated indexes (three by Campbell, two by Spitzer) as well as two newly developed indexes – symptom and affect scale specific for ESRD patients was used. The instrument was adapted and validated for use in Poland. The evaluation is based on the analysis of 7 independent sub-scales [13]:

- Spitzer and co-workers' (1981) Objective QOL (0-10 pts) concerns such aspects of life as professional activity, everyday activities, health, support and attitude toward the future.
- Spitzer and co-workers' (1981) Subjective QOL (0-100 pts) is a linear scale upon which the patient determines their evaluation in terms of independence as well as an evaluation of their life situation.
- The physical symptom scale (12-60 pts) contains a symptom scale with 12 questions regarding 12 symptoms (fatigue, headaches, muscle cramps, dyspnoea, chest pains, insomnia, pain in the joints, nausea, vomiting, stomach pains and increases in blood pressure), Patients are asked to rate each symptom on a scale of 1 (very severe) to 5 (absent) and the maximum score = 60. The lower the rating the greater the intensity of discomfort.
- Affect scale (12-60 pts), which is made up of 12 arbitrary emotions considered to influence patients' well-being, includes two positive and nine negative emotions. The twelfth asks about 'other' emotions experienced (the emotions are graded 1 = very severe to 5 = absent).

- Campbell and co-workers' (1976) Index of overall life satisfaction (1-7 pts) is a numerical scale which expresses the patient's level of satisfaction with life.
- Campbell and co-workers' (1976) Index of general affect (1-7 pts) is a list of 8 concepts related to life evaluation such as, sad, disappointed, bored or lonely. The final result on this scale is made up of the average for 8 questions.
- Campbell and co-workers' (1976) Index of well-being – the latter two components (Index of life satisfaction and Index of general affect) are combined as a total measure of well-being, with added weight given to life satisfaction (2.1-14.7 pts).

Results

Demographic characteristics

The research subjects were 53 (53%) women and 47 (47%) men (see Table 1). The average age for the entire group was 59.5±14.4 years of age. The average age for women was 60.3±14.8 and for men 58.4±14.2.

Table 1. Demographic factors

Demiographic variables	Women n= 53 (53%)	Men n= 47 (47%)	All n= 100 100%
Age			
20-40 years	7 13.2%	4 8.5%	11 11%
41-65 years	25 47.2%	27 57.4%	52 52%
66-90 years	21 39.6%	16 34.1%	37 37%
Educational level			
elementary	19 35.8%	12 25.5%	31 31%
vocational	19 35.8%	23 48.9%	42 42%
secondary	12 22.7%	8 17.0%	20 20%
post-secondary	3 5.7%	4 8.5%	7 7%
Marital status			
single	9 17.0%	8 17,0%	17 17%
married	26 49.0%	33 70.2%	59 59%
divorced	3 5.7%	2 4.3%	5 5%
widowed	15 28.3%	4 8.5%	19 19%

In terms of age breakdown, 11% of respondents were found in the 20-40 bracket, 52% were in the 41-65 bracket while 37% were found in the 66-90 range. The oldest respondent was 83 years of age. As for location, 46% lived in the countryside while 54% lived in cities.

In the research group, the largest group by educational level was made up of those with vocational education (42%). Only 7 % had higher education while one third had only elementary education. Over half the respondents (59%) were married. Only 11% were employed. Over half (52%) of respondents were on disability while 45% were retired. Materially, 21% of respondents positively evaluated their situation while 65% evaluated their economic situation as satisfactory. A worsening of their financial condition caused by dialysis was claimed by 51 % of the group.

Clinical data

The average time spent on dialysis for the group was 44.7 ± 48.6 months. The breakdown by sex was 46.6 ± 49.1 months for women and 42.6 ± 48.4 months for men. The most common cause of renal failure in the research subjects were diabetes (21%), kidney inflammation (glomerulonephritis 11%, interstitial nephritis 29%), polycystic kidney disease (13%), hypertensive disease (17%), systemic lupus erythematosus (5%), and rheumatoid nephritis (2%).

The Mann-Whitney test confirmed the existence of a statistically significant difference in levels of creatine concentration in blood serum in women and men ($p < 0.21$). The level of creatinine was significantly higher in men.

The time patients must spend on hemodialysis per week, including travel, was 8-10 hours for 57% of the group and 5-7 hours for 43%.

Functional capacity

The Barthel Index, IADL and the Karnofsky Performance Status Scale were used to evaluate functional capacity.

In terms of basic life activities, including those evaluated by the Barthel Index, the group studied had an average of 82.2 ± 20.1 pts. (women had 78.2 ± 22.1 pts., while men scored 86.6 ± 16.7 pts., (Mann-Whitney test $p < 0.015$). This result indicates that most men were independent in terms of basic life activities while women found themselves predominantly in medium serious condition.

The average on the IADL scale for the entire group was 18.9 ± 4.2 pts (women scored 17.9 ± 4.2 , while the men's score was 20.0 ± 4.1 , Mann-Whitney test $p < 0.011$). In the group studied women showed lesser fitness in terms of actions related to housework and in functioning outside the home. The patients' scores on the Karnofsky Performance Status Scale also showed greater independence for men (69.3 ± 13.6 pts) than women (62.1 ± 13.2). The Mann-Whitney test confirmed a difference in the level of functioning between women and men ($p < 0.014$). The score for the entire group was 65.5 ± 13.8 pts which indicates that a majority of the group required periodic care alongside their remaining abilities for self-care.

Differences in active capacity were analysed also with respect to such variables as age (up to and over 60 years), marital status, educational level, place of residence and employment status. Statistically significant differences were found (Mann-Whitney $p < 0.001$) in terms of basic (Barthel Index) and complex (IADL) life activities as well as functional capacity (the Karnofsky Scale) in the group examined with respect of age (ADL $p < 0.001$, IADL $p < 0.0001$, Karnofsky $p < 0.0002$) and education (ADL $p < 0.003$, IADL $p < 0.002$, Karnofsky $p < 0.0001$). No statistically significant difference was found however ($p < 0.05$) for functional capacity (as measured by ADL and IADL) with respect to marital status, place of residence or employment status.

Health Questionnaire Specific for End-Stage Renal Disease

This evaluation is based on the analysis of 7 independent subscales (Table 2). They are objective QOL, subjective QOL, physical symptom scale, emotional scale, general satisfaction with life and general emotional state. The sum of the general satisfaction and general emotional state subscales determines the welfare indicator.

Table 2. Evaluations from the Health Questionnaire Specific for End-Stage Renal Disease with respect to demographic variables

Indexes	Variables							
	Age*		Sex*		Educational level*		Marital status*	
Objective QOL (0-10 pts.)	<60 5.7±1.5 >60 4.5±1.5	<0.001	F 4.6±1.4 M 5.6±1.8	0.006	B 4.8±1.6 H 5.8±1.6	0.009	S 4.5±1.4 M 5.4±1.7	0.006
Subjective QOL (0-100 pts.)	<60 63.5±12.5 >60 52.1±13.3	<0.001	F 54.3±14.1 M 61.1±13.4	0.014	B 54.7±13.8 H 64.8±12.4	0.003	S 55.1±14.4 M 59.2±13.7	0.105
Physical symp- tom scale (12-60 pts.)	<60 46.7±5.1 >60 43.7±5.9	0.005	F 43.6±5.6 M 46.8±5.4	0.004	B 44.5±5.9 H 46.9±5.1	0.084	S 43.9±6.0 M 46.0±5.5	0.105
Affect scale (12-60 pts.)	<60 41.5±9.7 >60 38.7±6.4	0.096	F 37.8±5.4 M 42.6±9.9	0.002	B 38.8±5.9 H 43.4±12.0	0.029	S 37.1±6.0 M 42.1±8.9	<0.001
Satisfaction with life scale (1-7 pts.)	<60 4.6±0.9 >60 3.7±1.0	0.000	F 3.8±1.0 M 4.4±0.9	0.004	B 4.0±1.0 H 4.4±1.0	0.051	S 3.8±1.0 M 4.3±0.9	0.018
General affect (1-7 pts.)	<60 4.5±0.9 >60 3.8±0.9	<0.001	F 4.0±1.0 M 4.4±0.9	0.012	B 3.9±0.9 H 4.7±0.9	0.000	S 3.7±1.0 M 4.4±0.9	<0.000
Well-being (2.1-14.7 pts.)	<60 9.5±1.7 >60 7.9±1.9	<0.001	F 8.2±2.0 M 9.3±1.7	0.004	B 8.3±1.9 H 9.6±1.9	0.005	S 7.9±2.0 M 9.2±1.8	<0.000

* Test Mann-Whitney, statistically significant p -value $p < 0.05$.

Key: age: <60 below 60, >60 above 60; sex: F female, M male; education: B basic (elementary, vocational), H (secondary and post-secondary); marital status: S single, M married.

In the index Objective QOL the group scored 5 ± 1.6 pts.

The relative standard deviation is 32%, which indicates that the group studied was moderately differentiated in terms of objective QOL.

The Subjective QOL index was evaluated as having an average of 57 ± 14 pts with a relative standard deviation of 24% which shows that the group was moderately differentiated in terms of subjective QOL though to a lesser degree than with the objective QOL index. Using Spearman's rank correlation coefficient ($r=0.82$) the dependence between objective and subjective QOL was shown. A higher objective QOL evaluation is accompanied by higher subjective perception of QOL.

The Satisfaction with life scale averaged 4.1 ± 1.0 pts. The relative standard deviation was 24%, which indicates that the group studied was moderately differentiated in terms of general satisfaction with life. Using Spearman's rank correlation coefficient a statistically significant relationship between objective ($r=0.081$) and subjective ($r=0.84$) QOL and satisfaction with life was found. Higher objective and subjective QOL was accompanied by higher satisfaction with life.

On the General affect index a majority of patients scored 3.9 – 5 pts. The average for the group was 4.1 ± 1.0 pts out of a possible 7 pts. This indicates that a majority of persons describe their life moderately interesting and pleasant.

The Well-being index is comprised of the sum of the satisfaction with life index and the General affect index. A score between 8-10 pts was achieved by 40% of the group. The average was 8.2 pts.

On the Physical symptom scale the average point value for the group was 45.1 ± 5.7 pts out of 60 possible points. The lower the score the greater the severity of symptoms. The majority were found to be at an average level. Among the most frequent symptoms accompanying hemodialysis were fatigue (45%), muscle weakness (20%), muscle cramps (18%), headaches (15%), joint pain (15%), insomnia (12%), and itching (10%). Somatic symptoms are commonly seen in patients on dialysis during ESRD. Many of these are present continuously, are very severe and can interfere with the patient's lifestyle [14, 15].

An analysis of the Affect scale indicates that patients on average received 40.1 ± 18.4 out of a possible 60 points. A total of 94 % of respondents had a positive (determined) attitude about continuing treatment including 48% highly determined and 49% moderately determined. A general feeling of safety was found in 83% of the group including 66 % at a moderate level. Faith that things will work out was indicated by 73% of respondents with 25% at the highest level. Negative feelings were rarely mentioned. Of the more frequently occurring were loneliness (12%), sadness (10%), and feeling of powerlessness (10%).

Table 3. Correlation between sub-scales of the Health Questionnaire Specific for End-Stage Renal Disease *

Sub-scales	PS	AS	IOLS	IGA	IW	SQOLS	OQOLS
The physical symptom scale - PS	-	0.62	0.63	0.56	0.61	0.66	0.63
The Affect scale -AS	0.62	-	0.68	0.66	0.70	0.63	0.69
Index of overall life satisfaction – IOLS	0.63	0.68	-	0.85	0.94	0.84	0.82
Index of general affect - IGA	0.56	0.66	0.85	-	0.96	0.79	0.85

Index of well-being - IW	0.61	0.70	0.94	0.96	-	0.84	0.87
Subjective QOL scale - SQOLS	0.66	0.63	0.84	0.79	0.84	-	0.83
Objective QOL scale - OQOLS	0.63	0.69	0.82	0.85	0.87	0.83	-

* R - Spearman Correlation co-efficient, $p < 0.05$; The physical symptom scale – PS; The Affect scale – AS; Index of overall life satisfaction – IOLS; Index of general affect – IGA; Index of well-being – IW; Subjective QOL Scale - SQOLS; Objective QOL Scale – OQOLS.

Table 4. Correlation between sub-scales of the Health Questionnaire Specific for End-Stage Renal Disease and functional status and time on haemodialysis

Scale/ Variable	PS	AS	IOLS	IGA	IW	SQOLS	OQOLS	KPSS	BI	IADL
KPSS	0.72	0.65	0.76	0.76	0.79	0.85	0.81	-	0.81	0.83
IB	0.65	0.55	0.60	0.60	0.62	0.72	0.70	0.81	-	0.92
IADL	0.62	0.57	0.63	0.65	0.66	0.74	0.73	0.83	0.92	-
THD	0.04	0.12	0.07	-0.06	-0.01	-0.03	-0.01	-0.05	0.03	0.02

* statistically important; The physical symptom scale – PS; The Affect scale – AS; Index of overall life satisfaction – IOLS; Index of general affect – IGA; Index of well-being – IW; Subjective QOL Scale - SQOLS; Objective QOL Scale – OQOLS; Karnofsky Performance Status Scale – KPSS; Bathel Index – BI; IADL Lawton – Brody Scale – IADL; Time on Haemodialysis - THD.

Using the Mann-Whitney test a statistically significant difference was found in the evaluation of particular sub-scales of the Health Questionnaire and some demographic variables (Table 3,4). The evaluations differed according to the sex and age of respondents (apart from the Affect Scale). Both women under 60 and men regardless of age rated their QOL as other aspects analysed in the questionnaire more highly. There were statistically significant differences in particular sub-scales apart from the Physical Symptoms Scale and general satisfaction with life depending on education. Those persons with secondary and post-secondary education had higher scores.

Marital status, however, correlated with differences in all sub-scales apart from Subjective QOL and the Physical symptom Scale. Married people had higher scores compared with unmarried people.

Using the Spearman correlation co-efficient, moderate and strong correlations were found between particular sub-scales. An increase in values on particular scales affects increases in objective and subjective QOL. It should be borne in mind that a higher score on the Physical Symptom Scale indicates lower degrees of illness. Strong and very strong correlations were found between indicators of well-being and the remaining scales on the questionnaire.

Using the Spearman coefficient correlation moderate and strong correlations were found between particular sub-scales and functional capacity as measured by the ADL, Barthel Index, Lawton's IADL and

the Karnofsky Performance Status Scale. There was no statistically significant dependence between the length of renal-replacement therapy and particular scales on the Parfrey et al Health Questionnaire as well as the functional capacity of patients.

Discussion

This article presents a new look at renal failure through the prism of functional dependence and QOL as evaluated in the Health Questionnaire Specific for ESRD which is a rather rarely used instrument.

Until this time, research has concentrated mainly on different aspects of treatment, transplantation or the biochemical results of research while little attention has been paid to difficulties patients face in day to day functioning. From this came the idea of evaluating the level of functional dependence through the use of the instruments described above, that is the Barthel Index, the Lawton – Brody IADAL Scale and the Karnofsky Performance Status Scale, in order to examine the QOL which is determined by functional capacity.

Active independence is not only a guarantee of well-being but it is also an essential factor in lessening the number of complications, return hospitalizations and even mortality for all those with chronic illnesses including those treated with dialysis [16]. The degree of dependence is a factor both in morbidity and mortality for hemodialysis patients and strengthens the conviction that research in this area is essential [17]. The results unambiguously indicate a relationship between demographic factors such as sex (with women having a lower degree of functional capacity) as well as age and education for functional status among those researched as measured by the Barthel Index, the IADAL and the Karnofsky scale.

These results proved to be somewhat similar to the reports of other authors [6,16,18].

Analysing the activity levels of respondents indicates that most of the group required periodic care but were able to take care of themselves. It should be stressed that patients who are functionally independent both in this research and in that of others [16] are usually younger and characterized by better health and therefore a higher quality of life.

It is obvious that higher objective and subjective quality of life is accompanied by greater satisfaction with life. Considering the results of the Questionnaire Specific for ESRD it turned out that the group studied was more diverse with respect to objective than subjective QOL. Although negative feelings were rarely mentioned respondents did express moderate satisfaction with life evaluating it as not very interesting and moderately pleasant. Those surveyed despite their moderate satisfaction with life did indicate a higher feeling of safety and determination in continuing treatment. The possibility cannot be excluded that their attitude resulted from fatigue from the longterm nature of their illness as well as the necessity to undergo long and tiring dialysis. A similar emotional state and a significant correlation between most sub-scales of the KDQOL and fear and depression has been shown [19].

An analysis of particular domains of QOL (sub-scales of the questionnaire) and selected demographic factors indicated that women under 60 and men in all age groups who were married and had secondary and post-secondary education rated their QOL more highly.

In addition a strong correlation between welfare and all sub-scales emerged.

Comparable results were found in earlier empirical research [20,21,22,23] in which it was shown that patients with ESRD who were either female, over the age of 55, single, unemployed, with co-occurring illnesses (usually diabetes and depression) or frequently hospitalized had lower results in terms of QOL.

Patients with ESRD who receive renal replacement therapy suffer from many physical and emotional symptoms. From the literature it turns out that the dominant physical symptoms are chronic fatigue, pain, discomfort, muscle cramps, sleep disorders and sexual disruption [24,25]. The symptoms listed were confir-

med in the present research. In the forefront of emotional symptoms the risk or presence of depression can be frequently found. In the present research feelings of psycho-physical discomfort, sadness and loneliness were found. The emergence of symptoms which are the principle cause of discomfort in a group of dialysis patients deserves particular attention because these are not always part of routine clinical evaluation [1,5].

A number of observations are necessary for a full analysis of the results. The first of these is the strong correlation between well-being, whose main component is state of health and all sub-scales. With the Health Questionnaire Specific for ESRD it should be accepted that different patients ascribe different values to the same health status and have different preferences which result from a specified health status. Secondly, most of those studied were capable of self-care although they require periodic care probably due to the presence of co-existing illnesses and the long term nature of treatment. Assuming that the presence of other chronic illness may gradually change and may significantly affect patients' expectations and life goals it can be confirmed that patients develop coping strategies in the context of a life with limitations. This is why younger patients especially remain functionally independent for a long time.

The present research was also carried out with certain limitations. One of these is the cross-sectional nature of the research which excludes the possibility of comparing accepted significant variables with QOL before beginning dialysis. Therefore due to the cross-sectional nature of the research it is possible to speak of the influence of variables on physical and emotional dimensions at a given time in order for certain comparisons and generalization to be as real as possible. Another aspect is the lack of a relationship between length of renal replacement therapy and particular sub-scales of the questionnaire which probably results from limits of the research instrument. Such limitations turn out to be useful since they make it possible to conduct research on a large population at the same time. The possibility cannot be excluded that the results concerning functional ability, obtained on the basis of printed instruments, at times have a proclamational tone on the part of patients which is why they should be interpreted with care.

In summary, the Health Questionnaire Specific for ESRD turned out to be a promising instrument. The results in the present as in prior research [26,27,28,29] may differ because of many accepted variables but simultaneously confirm that in patients with ESRD treated with hemodialysis is significantly lower compared with the general population and the chance of kidney transplantation results in an improved QOL in comparison with patients on dialysis.

Conclusions

1. The group studied showed an average level on particular scales of the Health Questionnaire Specific for ESRD.
2. Demographic variables, especially sex and age, and to a lesser degree educational level and marital status have an influence on the results of the Health Questionnaire Specific for ESRD.
3. Activity levels had a significant influence on the results in the area of QOL.

References

1. Abdel-Kader K, Unruh ML, Weisbord S. Symptom Burden, Depression, and Quality of Life in Chronic and End-Stage Kidney Disease. *CJASN* 2009; 4 (6):1057-64. doi: 10.2215/CJN.00430109.
2. Račić M, Petković N, Bogicevic K. et al. Comprehensive geriatric assessment: comparison of elderly hemodialysis patients and primary care patients. *Ren Fail.* 2015; 37 (7):1126-31. doi: 10.3109/0886022X.2015.1057459.

3. Song MK, Ward SE, Bair E. et al. Patient-reported cognitive functioning and daily functioning in chronic dialysis patients. *Hemodial Int.* 2015; 19 (1): 90-9. doi: 10.1111/hdi.12202.
4. Marc M, Saad MM, Douaihy YE. et al. Predictors of quality of life in patients with end-stage renal disease on hemodialysis. *Int J Nephrol Renovasc Dis.* 2015; 8:119-23. doi: 10.2147/IJNRD.S84929.
5. Hedayati SS, Bosworth HB, Briley LP. et al. Death or hospitalization of patients on chronic hemodialysis is associated with a physician-based diagnosis of depression. *Kidney International.* 2008; 74:930–6. doi: 10.1038/ki.2008.311.
6. Aghakhani N, Sharif NH, Zadeh SS, Toupchi V, Toupchi S, Rahbar N. Quality of life during hemodialysis and study dialysis treatment in patients referred to teaching hospitals in Urmia-Iran in 2007. *Caspian J Intern Med.* 2011; 2 (1):183–8.
7. Carmichael P, Popoola J, John I, Stevens P, Carmichael AR. Assessment of quality of life in a single centre dialysis population using the KDQOL-SF Tm questionnaire. *Qual Life Res.* 2000; 9 (2):195-205.
8. Stewart AL, Hays RD, Ware JE. Methods of validating MOS health Measures. [in:] Stewart AL, Ware JE, Durham. (ed.) *Measuring functioning and well-being: the medical outcomes study approach.* Published by Duke University Press 1992.
9. Saby A, Miller LS. Functional Assessment in End-Stage Renal Disease: Enhancing Quality of Life. *Semin Dial.* 2016; 29 (2):170-2. doi: 10.1111/sdi.12466.
10. PROQOLID Patient – Reported Outcome and Quality of Life Instruments Database. List of instruments in alphabetical order. http://www.proqolid.org/search/1/search_engine.
11. Lawton MP, Brody EM. Assessment of older people: self-maintaining and instrumental activities of daily living. *Gerontologist.* 1969; 9 (3):179-86.
12. Karnofsky DA, Abelmann WH, Craver LF, Burchenal JH. The Use of the Nitrogen Mustards in the Palliative Treatment of Carcinoma – with Particular Reference to Bronchogenic Carcinoma. *Cancer.* 1948; 1 (4): 634-56. [https://doi.org/10.1002/1097-0142\(194811\)1:4<634::AID-CN-CR2820010410>3.0.CO;2-L](https://doi.org/10.1002/1097-0142(194811)1:4<634::AID-CN-CR2820010410>3.0.CO;2-L).
13. Parfrey PS, Vavasour H, Bullock M, Henry S, Harnett JD, Gault MH. Development of a health questionnaire specific for end-stage renal disease. *Nephron.* 1989; 52 (1): 20-8. doi: 10.1159/000185577.
14. Parfrey PS, Vavasour HM, Henry S, Bullock M, Gault MH. Clinical features and severity of nonspecific symptoms in dialysis patients. *Nephron.* 1988; 50: 121-8. doi: 10.1159/000185141.
15. Barret BJ, Vavasour HM, Major A, Parfrey PS. Clinical and psychological correlates of somatic symptoms in patients on dialysis. *Nephron.* 1990; 55:10-5. doi: 10.1159/000185911.
16. Jassal SV, Karaboyas A, Comment LA. i. in. Functional Dependence and Mortality in the International Dialysis Outcomes and Practice Patterns Study (DOPPS). *Am J Kidney Dis.* 2016; 67(2):283-92. doi: 10.1053/j.ajkd.2015.09.024.
17. Kurella TM, Covinsky KE, Chertow GM, Yaffe K, Landefeld CS, McCulloch CE. Functional status of elderly adults before and after initiation of dialysis. *N Engl J Med.* 2009; 15; 361 (16):1539-47. doi: 10.1056/NEJMoa0904655.
18. Boudreau JE, Dubé A. Quality of life in end stage renal disease: a concept analysis. *CANNT J.* 2014; 24 (1):12-20.
19. Chow SK, Tam BM. Is the kidney disease quality of life-36 (KDQOL-36) a valid instrument for Chinese dialysis patients? *BMC Nephrol.* 2014; 15:199. doi: 10.1186/1471-2369-15-199.

20. Gentile S, Jouve E, Dussol B, Moal V, Berland Y, Sambuc R. Development and validation of a French patient-based health-related quality of life instrument in kidney transplant: the ReTransQoL. *Health Qual Life Outcomes*. 2008; 6:78. doi: 10.1186/1477-7525-6-78.
21. Rebollo P, Ortega F, Baltar JM. i in. Health related quality of life (HRQOL) of kidney transplanted patients: variables that influence it. *Clinical Transplantation*. 2000; 14: 199–207.
22. Gentile S. Principal determinants of quality of life. *Soins*. 2004; 688 (suppl):4.
23. Lippe N, Waldum B, Brekke FB, Amro AA, Reisaeter AV, Os I. From dialysis to transplantation: a 5year longitudinal study on self-reported quality of life. *BMC Nephrol*. 2014; 2: 15 – 191. doi: 10.1186/1471-2369-15-191.
24. Weisbord SD, Fried LF, Mor MK. et al. Renal provider recognition of symptoms in patients on maintenance hemodialysis. *Clin J Am Soc Nephrol*. 2007; 2: 960–7. doi: 10.2215/CJN.00990207.
25. Palmer BF. Sexual dysfunction in men and women with chronic kidney disease and end-stage kidney disease. *Adv Ren Replace Ther*. 2003; 10: 48–60. doi: 10.1053/jarr.2003.50003.
26. Jaar BG, Chang A, Plantinga L. Can we improve quality of life of patients on dialysis? *Clin J Am Soc Nephrol*. 2013; 8 (1):1–4. doi: 10.2215/CJN.11861112.
27. Pagels AA, Söderkvist BK, Medin C, Hylander B, Heiwe S. Health-related quality of life in different stages of chronic kidney disease and at initiation of dialysis treatment. *Health Qual Life Outcomes*. 2012; 10:71. doi: 10.1186/1477-7525-10-71.
28. Md Yusop NB, Yoke Mun C, Shariff ZM, Beng Huat C. Factors associated with quality of life among hemodialysis patients in Malaysia. *PLoS One*. 2013; 8(12): e84152. doi: 10.1371/journal.pone.0084152. doi: 10.1371/journal.pone.0084152.
29. Feroze U, Noori N, Kovesdy CP. et al. Quality-of-life and mortality in hemodialysis patients: roles of race and nutritional status. *Clin J Am Soc Nephrol*. 2011; 6 (5):1100–11. doi: 10.2215/CJN.07690910