

## Assessment of Nursing Problems in Patients with Haemodialysis and Peritoneal Dialysis

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**Key Words:** *nursing problems, patients, haemodialysis, peritoneal dialysis.*

**Summary.** The aim was to assess the nursing problems of patients with haemodialysis and peritoneal dialysis.

**Material and Methods.** The study was performed at three Vilnius hospitals with dialysis health care service for outpatients. Private dialysis centres were excluded. The data was collected in July through November, 2014. One-hundred forty-one patients met inclusion criteria and agreed to participate in the study (response rate, 100.0%). The questionnaire was made by the authors of this study. Patients were asked to report on their health problems that appeared during the last 4 weeks. The study protocol was approved by the Centre of Bioethics at the Lithuanian University of Health Sciences.

**Results.** The most frequent nursing problems among haemodialysis and peritoneal dialysis patients were high blood pressure (73.3%), weakness (66.7%), hand and leg cramps (65.9%), sleep problems (62.4%) and dry skin (57.4%). Nursing problems such as high blood pressure (74.1% in haemodialysis patients and 69.7% in peritoneal dialysis patients, respectively), weakness (71.3% and 51.5%, respectively) and sleep problems (69.4% and 39.4%, respectively) were more prevalent among haemodialysis patients than peritoneal dialysis patients. Besides, hand and leg cramps were more relevant for peritoneal dialysis patients in comparison with haemodialysis patients (81.8% and 61.1%, respectively). Some health problems were relevant for patients after dialysis treatment that lasted for 10 years and longer: 90.9% of patients had weakness, 81.8% had high blood pressure and dry skin, and 63.6% had headache and muscles pain.

**Conclusions.** Assessment of nursing problems assures individual care of patients with haemodialysis and peritoneal dialysis. Patient-centred care is provided if nursing professionals ground care planning on identified patients' health problems and care needs.

### **Introduction**

Chronic renal disease is considered a worldwide health problem. The disease is diagnosed by decreased glomerular filtration associated with loss of regulatory, excretory and endocrine functions of the kidney. Peritoneal dialysis and haemodialysis are options for the end-stage renal disease patients.

The haemodialysis procedure involves the perfusion of blood and dialysate on opposite sides of a semipermeable membrane. Substances are removed from the blood by diffusion and convection. Excess plasma water is removed via ultrafiltration. The peritoneal dialysis procedure involves the instillation of dialysate into the peritoneal cavity via a permanent peritoneal catheter. The selection of haemodialysis or peritoneal dialysis is usually based on patient's motivation, geographic distance from dialysis centres or units, patient's education, finances, and the health care system in a country.

Patients on dialysis are commonly affected by a multitude of clinical health problems that require

assessment and continuous monitoring, including anaemia, mineral and bone disorder, malnutrition, inflammation, vascular access-related infection, and volume management (1). Haemodialysis is a life-long treatment that significantly and sometimes adversely affects patients' physical and mental abilities, with depression, anxiety and fatigue being common issues.

Nurses spend more face-to-face time with dialysis patients than any other healthcare provider. They can use that time to educate patients and families, negotiate a treatment plan, and work with the care team to ascertain and overcome barriers to compliance.

In a haemodialysis unit, the implementation of the nursing process is fundamental, as it allows nurses to develop a specific plan of care for the patient, the identification and monitoring of adverse effects of treatment, such as complications of the disease, and the possibility of the development of educational programmes for promotion, prevention and treatment (2).

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Patients describe the experience of haemodialysis as a daily struggle to accept illness and adjust to the treatment (3). Patients are unwilling to become a burden or liability, and question their identity, pride and self-image (4). Haemodialysis and peritoneal dialysis patients in particular require constant physical and emotional support. Thus, nurses should adopt an individualised approach to support psychological well-being and help patients adapt to a changing lifestyle (5).

The quality of the rendered care is associated with the role of nephrology nurses, with specialized expertise and patient–nurse interaction being important predictors affecting the quality of the provided care.

The aim of this study was to assess nursing problems of patients with haemodialysis and peritoneal dialysis.

### Material and Methods

**Study Design and Sample.** The study was performed at three Vilnius hospitals where dialysis care for outpatients was provided. Private dialysis centres were excluded. The data were collected from July to November, 2014.

According to the register list, at the time of the study, there were 148 outpatients who attended dialysis treatment. The inclusion criteria were: age  $\geq 18$  years, dialysis treatment lasted  $\geq 3$  months, and the ability to speak Lithuanian. The exclusion criteria were dementia and patients hospitalised for acute care at the study moment. One-hundred forty-one patients met the inclusion criteria and agreed to participate in the study (response rate, 100.0%) (Table 1).

**Study Organisation.** The questionnaire was distributed to study participants by one of the authors (AM). A positive attitude toward the study from administrative staff in all dialysis centres ensured a high response rate. The data collection process avoided disturbance of patient's treatment, diagnostics and nursing care procedures. Patients filled the questionnaire during the dialysis procedures if the

time was comfortable for them, or before and/or after a physician's consultation.

**The Instrument.** Sixteen nursing problems usually reported in scientific and clinical literature were included in the instrument for the assessment by patients: high blood pressure, low blood pressure, foot tumefaction, itchy skin, dry skin, shortness of breath, headache, chest pain, muscles pain, hands, legs cramps, nausea, lack of appetite, constipation, sleep problems, weakness and dizziness. Patients were asked to mark the problem that was present during the last 4 weeks. Patients were able to indicate and mark more than one nursing problem relevant for their health from the list.

Sociodemographic characteristics of study participants were also recorded. A pilot test of the instrument had been performed ( $n=5$ ) before the main survey.

**Ethical Consideration.** The study protocol was approved by the Centre of Bioethics at the Lithuanian University of Health Sciences (No. BECKS(M)-133).

**Statistical Analysis.** Statistical analysis was carried out on SPSS version 17.0 (6). The data were analysed using the chi-square ( $\chi^2$ ) test. Comparisons of the data were made in accordance with the type of dialysis and duration of dialysis. The differences were considered statistically significant when  $p<0.05$ .

### Results

Sociodemographic characteristics of patients are presented in Table 2. There was an approximately equal number of men and women (49.6% of men, and 50.4% of women). The largest group of patients were 55–69 years. Patients mostly had secondary (36.9%) or college (26.2%) education and were married (57.4%).

Nursing problems of haemodialysis and peritoneal dialysis patients are presented in Table 3. During 4 weeks, the most frequent nursing problems among the patients were high blood pressure (73.3%), weak-

Table 1. Study Participants, Selected from the Register List

Study Site	Patients in Dialysis Treatment (n)			
	Met Inclusion Criteria		Not Met Inclusion Criteria	
	Haemodialysis	Peritoneal Dialysis	Haemodialysis	Peritoneal Dialysis
University hospital	44	23	1	–
Clinical hospital A	37	–	2	–
Clinical hospital B	27	10	2	2
Total	108	33	5	2
	n=141		n=7	

*Table 2.* Sociodemographic Characteristics of Patients, n=141

Sociodemographic Characteristics		n (%)
Gender	Men	70 (49.6)
	Women	71 (50.4)
Age group	18–39 years	20 (14.2)
	40–54 years	35 (24.8)
	55–69 years	52 (36.9)
	70–85 years	34 (24.1)
Education	Primary	13 (9.3)
	Secondary	52 (36.9)
	College	37 (26.2)
	High not university	12 (8.5)
	University	27 (19.1)
Family status	Married	81 (57.4)
	Single	18 (12.8)
	Divorced	15 (10.6)
	Widower	24 (17.1)
	Lived with partner	3 (2.1)
Place of residence	Town	120 (85.1)
	Rural	21 (14.9)

ness (66.7%), hand and leg cramps (65.9%), sleep problems (62.4%) and dry skin (57.4%). High blood pressure and weakness were more prevalent for haemodialysis patients in comparison with peritoneal dialysis patients (74.1% and 69.7%, and 71.3% and 51.5%, respectively), although high blood pressure differences were not statistically significant. Hand and leg cramps were more prevalent among peritoneal dialysis patients (81.8%) in comparison with haemodialysis patients (61.1%). Patients with haemodialysis had more complaints with sleep problems than those with peritoneal dialysis (64.4% and 39.4%, respectively). Some nursing problems were equally typical for both groups: itchy skin, dry skin, and shortness of breath. Nausea was the least relevant nursing problem for haemodialysis patients (28.7%), like for patients with peritoneal dialysis (6.1%). All nursing problems were more prevalent for haemodialysis patients compared with peritoneal dialysis patients, except for foot tumefaction and hand and leg cramps (Table 3).

The distribution of patients in relation to the duration of the dialysis treatment and prevalence of nursing problems during the last 4 weeks is presented in Table 4. Some nursing problems continued to be present after 10 and more years of the dialysis treatment: 90.9% of patients had weakness, 81.8% had high blood pressure and dry skin, and 63.6% had headache and muscle pain. Foot tumefaction (46.4%) was more prevalent among patients with a short history of the dialysis treatment, i.e., 3–11 months. Half of the patients (50.0%) who were under the dialysis treatment for 3 to 11 months had sleep problems, although after a longer dialy-

sis treatment sleep problems were prevalent among 60.0% of the patients. According to the duration of patients' dialysis, there were no statistically significant differences in any nursing problems, except for weakness: the longer the dialysis treatment, the greater the weakness felt by the patients.

## Discussion

This study showed that patients with haemodialysis and peritoneal dialysis had multiple nursing problems. Some nursing problems were significantly related to the type of dialysis or the duration of the dialysis treatment. Thus, nurses must know patients' nursing problems and needs, carefully plan care and evaluate outcomes.

Twenty-four nursing diagnoses in chronic renal failure patients on haemodialysis were identified in Sturesson and Ziegert's (2014) study: the most frequent nursing problems were risk for infection, excess fluid volume and hypothermia (7). The majority of dialysis patients reported that their health condition did not allow them to do any strenuous activities or activities of a moderate intensity (8). In our study, we did not examine patients' activities, but it is clear that numerous nursing problems can affect patient's activity, and they have to be analysed in further studies. Gerogianni et al. (2014) named 22 nursing problems prevalent among dialysis patients: patients most often experienced retention of intracellular liquid, hyperkalaemia, hypothermia, oedema, intolerance to activity, and role failure. The less presented nursing problems were constipation, impairment of a primary sense of touch, nutrition below the organism's requirements and diarrhoea (9).

Silva et al. (2016) reported the most frequent nursing diagnoses for patients with chronic renal failure on peritoneal dialysis. Risk for infection, fatigue, impaired walking, constipation, acute pain and excess fluid volume were included in the list of nursing problems (10). In our study, the most relevant problem in patients with peritoneal dialysis was hand and leg cramps, although every sixth patient indicated fatigue, and every third mentioned pain and constipation.

The literature reports that anaemia, manifested as low haemoglobin level, affects nearly 90% of patients receiving dialysis (11) and is a major risk factor for hospitalisation (12). The most clear symptoms of anaemia – weakness, shortness of breath and headache – were frequently mentioned by patients in our study. Prevalence of such a nursing problem in dialysis patients requires nurses to take into account the possibility of anaemia.

Issues related to care seemed to be of paramount importance for end-stage renal disease patients. Preservation of decency, nurses' cautiousness and

**Table 3.** Distribution and Comparison of Haemodialysis and Peritoneal Dialysis Patients by Prevalence of Nursing Problems During Last 4 Weeks, n=141

Nursing Problem During Last 4 Weeks	Type of Dialysis, n (%)		Total, n (%)	$\chi^2$ , df, P
	Haemodialysis, n=108	Peritoneal, n=33		
High blood pressure	Yes No	80 (74.1) 28 (25.9)	23 (69.7) 10 (30.3)	103 (73.0) 38 (27.0)
Hypotension	Yes No	57 (52.8) 51 (47.2)	8 (24.2) 25 (75.8)	65 (43.9) 76 (56.1)
Foot tumefaction	Yes No	36 (33.3) 72 (66.7)	17 (51.5) 16 (48.5)	53 (37.6) 88 (62.4)
Itchy skin	Yes No	50 (46.3) 58 (53.7)	14 (42.4) 19 (57.6)	64 (45.4) 77 (54.6)
Dry skin	Yes No	62 (57.4) 46 (42.6)	19 (57.6) 14 (42.4)	81 (57.4) 60 (42.6)
Shortness of breath	Yes No	36 (33.3) 72 (66.7)	11 (33.3) 22 (66.7)	47 (33.3) 94 (66.7)
Weakness	Yes No	77 (71.3) 31 (28.7)	17 (51.5) 16 (48.5)	94 (66.7) 47 (33.3)
Dizziness	Yes No	57 (52.8) 51 (47.2)	11 (33.3) 22 (66.7)	68 (48.1) 73 (51.9)
Headache	Yes No	57 (52.8) 51 (47.2)	13 (39.4) 20 (60.6)	70 (49.6) 71 (50.9)
Chest pain	Yes No	36 (33.3) 72 (66.7)	9 (27.3) 24 (72.7)	45 (31.9) 96 (68.1)
Muscles pain	Yes No	43 (39.8) 65 (60.2)	11 (33.3) 22 (66.7)	54 (38.3) 87 (61.7)
Hand and leg cramps	Yes No	66 (61.1) 42 (38.9)	27 (81.8) 6 (18.2)	93 (65.9) 48 (34.1)
Nausea	Yes No	31 (28.7) 77 (71.3)	2 (6.1) 31 (93.9)	33 (23.4) 108 (79.6)
Lack of appetite	Yes No	40 (37.0) 68 (63.0)	7 (21.2) 26 (78.8)	47 (33.3) 94 (66.7)
Constipation	Yes No	39 (36.1) 69 (63.9)	10 (30.3) 23 (69.7)	49 (34.8) 92 (65.2)
Sleep problems	Yes No	75 (69.4) 33 (30.6)	13 (39.4) 20 (60.6)	88 (62.4) 53 (37.6)

skilfulness as well as adherence to safe practices could be indicated as important factors. A study of Kuchareva et al. (2013) revealed a high level of satisfaction of nursing services in haemodialysis patients (13). Patients' experiences mostly focus on issues of physical and psychological support in terms of provision of empathic care, the development of effective relationships with the staff, and good communication patterns.

Haemodialysis and peritoneal dialysis have a number of restrictions and modifications, affecting the quality of patient's life, their professional and psychological well-being as well as their social and economic status. Thus, nurses conducting dialysis for patients aim to identify nursing problems, pre-

dict adverse events and take care individually of each haemodialysis and peritoneal dialysis patient.

### Conclusions

The main problems in dialysis patients highlighted in this study were high blood pressure, weakness, hand and leg cramps, sleep problems and dry skin. Assessment of nursing problems assures individual care of patients with haemodialysis and peritoneal dialysis. Patient-centred care is provided if nursing professionals ground care planning on identified patients' health problems and care needs.

### Statement of Conflict of Interest

The authors state no conflict of interest.

*Table 4. Distribution and Comparison of Patients by Nursing Problems and Duration of Dialysis Treatment, n=141*

Nursing Problem During Last 4 Weeks		Duration of Dialysis Treatment, n (%)				$\chi^2$ , df, P
		3–11 months n=28	1–4 years n=74	5–9 years n=28	≥10 years n=11	
High blood pressure	Yes No	22 (78.6) 6 (21.4)	53 (71.6) 21 (28.4)	19 (67.9) 9 (32.1)	9 (81.8) 2 (18.2)	$\chi^2=1.323$ ; df=3; $P=0.724$
Hypotension	Yes No	10 (35.7) 18 (64.3)	35 (47.3) 39 (52.7)	15 (53.6) 13 (46.4)	5 (45.5) 6 (54.5)	$\chi^2=1.889$ ; df=3; $P=0.596$
Foot tumefaction	Yes No	13 (46.4) 15 (53.6)	29 (39.2) 45 (60.8)	10 (35.7) 18 (64.3)	1 (9.1) 10 (90.9)	$\chi^2=4.863$ ; df=3; $P=0.182$
Itchy skin	Yes No	12 (42.9) 16 (57.1)	33 (44.6) 41 (55.4)	15 (53.6) 13 (46.4)	4 (36.4) 7 (63.6)	$\chi^2=1.209$ ; df=3; $P=0.751$
Dry skin	Yes No	14 (50.0) 14 (50.0)	40 (54.1) 34 (45.9)	18 (64.3) 10 (35.7)	9 (81.8) 2 (18.2)	$\chi^2=4.192$ ; df=3; $P=0.241$
Shortness of breath	Yes No	7 (25.0) 21 (75.0)	29 (39.2) 45 (60.8)	8 (28.6) 20 (71.4)	3 (27.3) 8 (72.7)	$\chi^2=2.484$ ; df=3; $P=0.478$
Weakness	Yes No	14 (50.0) 14 (50.0)	47 (63.5) 27 (36.5)	23 (82.1) 5 (17.9)	10 (90.9) 1 (9.1)	$\chi^2=9.758$ ; df=3; $P=0.021$
Dizziness	Yes No	9 (32.1) 19 (67.9)	34 (45.9) 40 (54.1)	19 (67.9) 9 (32.1)	6 (54.5) 5 (45.5)	$\chi^2=7.552$ ; df=3; $P=0.056$
Headache	Yes No	11 (39.3) 17 (60.7)	38 (51.4) 36 (48.6)	14 (50.0) 14 (50.0)	7 (63.6) 4 (36.4)	$\chi^2=2.151$ ; df=3; $P=0.542$
Chest pain	Yes No	11 (39.3) 17 (60.7)	21 (28.4) 53 (71.6)	10 (35.7) 18 (64.3)	3 (27.3) 8 (72.7)	$\chi^2=1.421$ ; df=3; $P=0.701$
Muscles pain	Yes No	7 (25.0) 21 (75.0)	26 (35.1) 48 (64.9)	14 (50.0) 14 (50.0)	7 (63.6) 4 (36.4)	$\chi^2=7.020$ ; df=3; $P=0.071$
Hand and leg cramps	Yes No	15 (53.6) 13 (46.4)	53 (71.6) 21 (28.4)	18 (64.3) 10 (35.7)	7 (63.6) 4 (36.4)	$\chi^2=3.032$ ; df=3; $P=0.387$
Nausea	Yes No	6 (21.4) 22 (78.6)	20 (27.0) 54 (73.0)	6 (21.4) 22 (78.6)	1 (9.1) 10 (90.9)	$\chi^2=1.921$ ; df=3; $P=0.589$
Lack of appetite	Yes No	7 (25.0) 21 (75.0)	26 (35.1) 48 (64.9)	10 (35.7) 18 (64.3)	4 (36.4) 7 (63.6)	$\chi^2=1.100$ ; df=3; $P=0.777$
Constipation	Yes No	12 (42.9) 16 (57.1)	23 (31.1) 51 (68.9)	10 (35.7) 18 (64.3)	4 (36.4) 7 (63.6)	$\chi^2=1.275$ ; df=3; $P=0.735$
Sleep problems	Yes No	14 (50.0) 14 (50.0)	48 (64.9) 26 (35.1)	19 (67.9) 9 (32.1)	7 (63.6) 4 (36.4)	$\chi^2=2.389$ ; df=3; $P=0.496$

## Pacientų, kuriems atliekama hemodializė ir peritoninė dializė, slaugos problemų vertinimas

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**Raktažodžiai:** hemodializė, peritoninė dializė, pacientai, slaugos, slaugos problemas.

**Santrauka.** Darbo tikslas – įvertinti pacientų, kuriems atliekama hemodializė ir peritoninė dializė, slaugos problemas.

*Medžiaga ir metodai.* Tyrimas atliktas trijose Vilniaus miesto ligoninėse, kuriose ambulatoriškai atliekamos dializės. Privatūs dializijų centralai į tyrimą nebuvę įtraukti. Tyrimas vyko 2014 m. liepos – lapkričio mėn. Įtraukimo kriterijus atitiko 141 pacientas. Visi pacientai sutiko dalyvauti tyime (atsako dažnis –

100 proc.). Anketą sudarė tyrimo autorai. Tyrimui vykdyti gautas Lietuvos sveikatos mokslų universiteto Bioetikos centro leidimas.

**Rezultatai.** Dažniausios pacientų slaugos problemos per pastarąsias keturias savaites buvo susijusios su padidėjusiui arteriniu kraujospūdžiu (73,3 proc.), silpnumu (66,7 proc.), rankų ir kojų mėšlungiu (65,9 proc.), miego problemomis (62,4 proc.), sausa oda (57,4 proc.). Kai kurios slaugos problemos buvo aktualesnės tiems pacientams, kuriems buvo atliekama hemodializė, nei tiems, kurie lankési dėl peritoninės dializės: padidėjęs arterinis kraujospūdis (atitinkamai 74,1 proc. ir 69,7 proc.), silpumas (atitinkamai 71,3 proc. ir 51,5 proc.), miego sunkumai (atitinkamai 69,4 proc. ir 39,4 proc.). Rankų ir kojų mėšlungis dažniau pasitaikė pacientams, kuriems buvo atliekama peritoninė dializė negu hemodializė (atitinkamai 61,1 proc., kai atliekama peritoninė dializė, ir 81,8 proc., kai atliekama hemodializė). Kai kurios slaugos problemos buvo išskirtinai aktualios tiems pacientams, kuriems dializės atliekamos daugiau nei 10 metų: beveik visiems (90,9 proc.) pasireiškė silpumas, 81,8 proc. buvo aukštasis arterinis kraujospūdis ir sausa oda, 63,6 proc. pasireiškė galvos ir raumenų skausmas.

**Išvados.** Nustatyti slaugos problemas būtina norint pritaikyti individualią slaugą pacientams, kuriems atliekama hemodializė ir peritoninė dializė. Slaugytojai, planuojantys priežiūrą atsižvelgdami į pacientų slaugos problemas ir poreikius, laiduoja į pacientą orientuotas slaugos taikymą praktikoje.

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