

Supplementary Materials

Development of a Conceptual Model of Physical Functioning Limitations Experienced by Patients with Late-Stage Chronic Kidney Disease: A Qualitative Interview Study

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Supplementary Materials Table S1. Eligibility criteria for qualitative patient interviews

Inclusion criteria	Exclusion criteria
Diagnosis of CKD stage IV or V	Diagnosed with:
> 18 years of age	<ul style="list-style-type: none"> • New York Heart Association class III/IV heart failure
Resides in the USA (excluding Puerto Rico)	<ul style="list-style-type: none"> • pulmonary diseases
Speaks English	<ul style="list-style-type: none"> • type 2 diabetes
Willing and able to electronically sign an informed consent form	<ul style="list-style-type: none"> • presence of an active malignancy • neurological events or a mental condition causing the patient to be unable to understand the nature, scope and possible consequences of the study
Has access to a telephone or cell phone or an internet-connected computer	<ul style="list-style-type: none"> • musculoskeletal diseases that significantly limit the patient's functional status
	BMI < 18.5 kg/m ² or ≥ 40 kg/m ²
	Received dialysis within the past 90 days
	Been hospitalized for any reason within 6 weeks before participation

Patients receiving dialysis and/or with comorbidities such as diabetes were excluded from this study because they may experience additional barriers to physical functioning compared with patients not receiving dialysis or without such comorbidities.

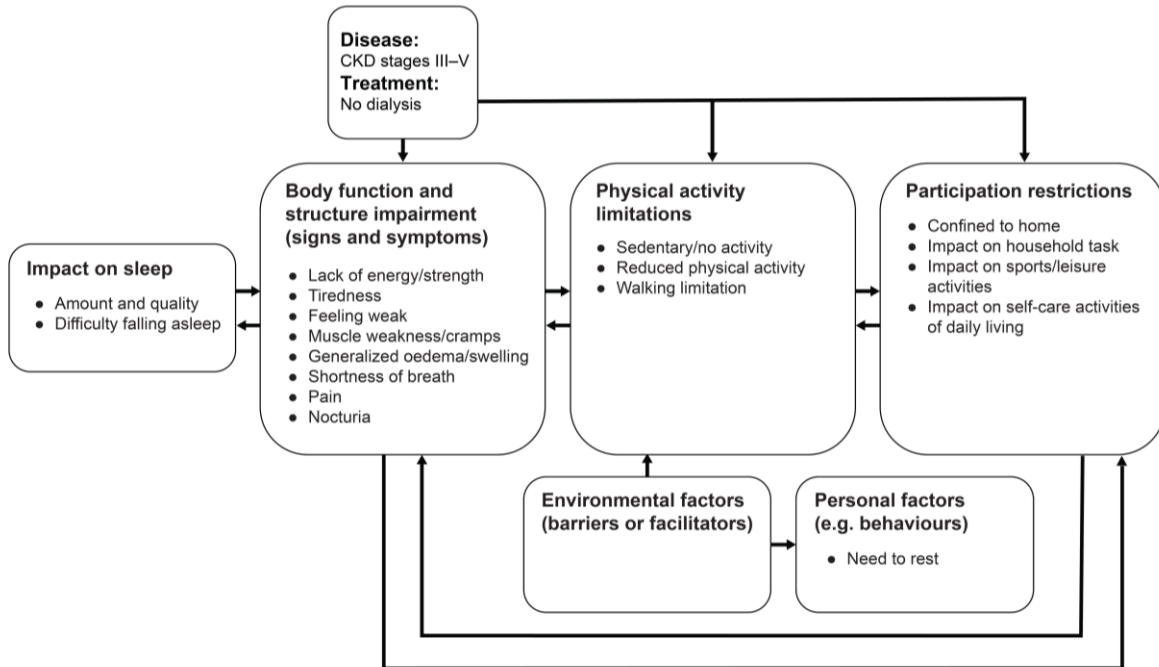
BMI body mass index, *CKD* chronic kidney disease

Supplementary Materials Table S2. Frequency of mentions of concepts related to physical functioning limitations in patients with CKD stages IIIa–IV from a TLR and previous patient interviews

Concept	Number of mentions	
	Interview transcripts	Targeted literature reviews
Symptoms		
Tiredness/lack of energy/lack of strength/feeling weak	8	6
Generalized oedema/swelling	10	1
Muscle weakness/cramps	7	2
Shortness of breath	6	2
Pain	2	4
Nocturia	3	0
Impact on sleep (amount, quality, difficulty falling asleep)	6	1
Physical activity limitations		
Sedentary/no activity	1	0
Reduced physical activity	1	1
Walking limitation	2	0
Participation restrictions		
Confined to home	2	0
Impact on household tasks	1	1
Impact on sports/leisure activities	2	1
Impact on self-care activities of daily living	1	2

CKD chronic kidney disease, *TLR* targeted literature review

Supplementary Materials Fig. S1. Preliminary conceptual model summarizing physical function limitations in patients with mid-to-late stage CKD. Concepts were identified from a targeted literature review for patients with CKD stages IV–V and previous interviews with patients with CKD stages IIIa–IIIb. *CKD* chronic kidney disease



Supplementary Materials Table S3. Concepts related to physical functioning limitations reported by patients during concept elicitation interviews

Concept	Total patients, n (%) (n = 23)^a
Walking up and down stairs	19 (83)
Walking (distance)	17 (74)
Walking (speed)	16 (70)
Lifting items/picking things up	14 (61)
Standing up for long durations	11 (48)
Bending down/bending over	6 (26)
Unable to walk	6 (26)
Walking up incline	5 (22)
Unable to sit/lie in one position for extended periods	5 (22)
Walking (duration)	4 (17)
Performing physical activity for long durations	4 (17)
Lifting arms above head	3 (13)
Difficulty with balance (due to oedema)	2 (9)

^aThe n values are the number of patients who reported physical impacts

Supplementary Materials Table S4. Concepts reported by patients during concept elicitation interviews

Concept	Total patients, n (%) (n = 23)^a
Behavioural impact	
Need to rest/subsequent periods of rest	23 (100)
Participation in fewer activities	21 (91)
Reduced frequency of activity	15 (65)
Modification in planning activity/modifies plan	15 (65)
Avoid lifting heavy items	13 (56)
Reduced pace of activity	13 (56)
Modification of diet to alleviate symptoms/improve health	10 (43)
Avoid walking places	9 (39)
Complete fewer active tasks in a day	8 (35)
Avoid activity	7 (30)
Need to move/get up/change position	6 (26)
Avoid sudden movements	4 (17)
Avoid strenuous activity	4 (17)
Isolate oneself	3 (13)
Stop activity	2 (9)
Total patients, n (%) (n = 23)^a	
Avoidance/care during activities due to concern of falling/discomfort from swollen feet	2 (9)
Avoid repetitive lifting	1 (4)
Increased exercise for prevention of decline/improvement in health	1 (4)
Activity participation restrictions	
Reduced ability to handle household tasks	22 (96)
Reduced social activities/social life	18 (78)

Reduced sports/leisure activities	17 (74)
Reduced job/work routine efficiency	16 (70)
Reduced ability to perform exercise/gym	16 (70)
Difficulty shopping	13 (56)
Difficulty with bathing/self-care	8 (35)
Reduced travelling	8 (35)
Reduced family role	7 (30)
Confined to home	5 (22)
Unable to fit into clothes/shoes	4 (17)
Difficulty driving	4 (17)
Difficulty getting out of bed	3 (13)
Reduced sexual activities	3 (13)

Symptoms

Lack of energy/tiredness/fatigue	23 (100)
Muscular difficulties/lack of strength	19 (83)
Pain	16 (70)
Shortness of breath	16 (70)
Increased urination	13 (56)
Oedema/swelling	13 (56)
General (including dizziness, light-headedness, vomiting, nausea, itchy skin, fever)	13 (56)

Concept	Total patients, n (%) (n = 23)^a
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Impact on sleep

Poor/reduced quality of sleep	15 (65)
Difficulty falling asleep	8 (35)
Waking up during the night	6 (26)

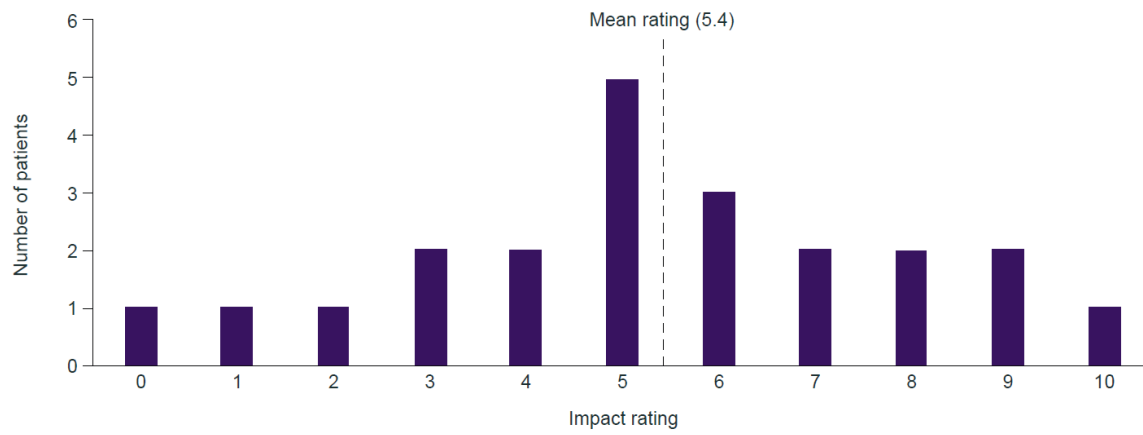
Emotional functioning

Frustrated	8 (35)
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Embarrassed	5 (22)
Depressed	3 (13)
Feeling like a burden on family	3 (13)

^aThe n values are the number of patients who reported physical impacts

Supplementary Materials Fig. S2. Patients' perceived overall impact on their lives from CKD-related physical limitations. Twenty-two patients provided scores between 0 (not impacted at all) and 10 (extremely impacted). *CKD* chronic kidney disease



Supplementary Materials Table S5. Symptoms reported by patients as important for therapies to alleviate

Symptom	Total patients, n (%) (<i>n</i> = 17)
Fatigue/lack of energy	10 (59)
Shortness of breath	4 (24)
Lack of stamina/endurance	4 (24)
Oedema/swelling	3 (18)
Increased frequency of urination	2 (12)
Lack of strength/feeling weak	2 (12)
Pain	2 (12)
Enlarged abdomen/kidney	2 (12)
Dizziness	1 (6)

Supplementary Materials Table S6. Physical activities patients would most want improved if their symptoms were alleviated through a new treatment

Physical activity	Total patients, n (%) (<i>n</i> = 16)
Walking	6 (38)
Sports/exercise	5 (31)
Household tasks	5 (31)
Work/voluntary work	5 (31)
Travelling	3 (19)
Shopping	2 (13)
Family role	1 (6)
Walking up and down stairs	1 (6)