

SUPPLEMENTAL MATERIAL

Supplemental Table 1: Proportion of missingness for covariate variables

Supplemental Table 2: Patient characteristics of those who completed the patient questionnaire (PQ) and those who did not

Supplemental Table 3: Association of selected factors (with CKD stage 3 split into stage 3a and stage 3b) with the likelihood of having moderate-to-extreme pruritus in non-dialysis CKD patients

Supplemental Table 4: Association of selected factors and laboratory values with the likelihood of having moderate-to-extreme pruritus in non-dialysis CKD patients

Supplemental Table 1: Proportion of missingness for covariate variables

	N	Missing data	
		N	%
Country	3780	0	0
Age	3780	0	0
Female	3780	0	0
<i>History and severity of CKD</i>			
eGFR, ml/min	3780	0	0
Albumin- or protein-to-creatinine ratio	3093	687	18
Cause of CKD	3375	405	11
Comorbidities, %			
<i>Hypertension</i>	3738	42	1
<i>Diabetes</i>	3773	7	0
<i>Peripheral Vascular Disease</i>	3691	89	2
<i>Congestive Heart Failure</i>	3743	37	1
<i>Lung Disease</i>	3690	90	2
<i>Depression</i>	3673	107	3
<i>Psychiatric Disorder</i>	3688	92	2
<i>Recurrent Cellulitis, Gangrene</i>	3688	92	2
<i>History cirrhosis of the liver</i>	3586	194	5
<i>Lab Values</i>			
HbA1C*, %	2073	422	26
Serum calcium, mg/dl	3341	439	12
Serum phosphorus, mg/dl	3165	615	16
Hemoglobin, g/dL	3391	389	10
<i>Medication</i>			
Antihistamines	3,393	387	10
Gabapentin	3,393	387	10
Pregabalin	3,393	387	10
<i>Patient-reported outcomes</i>			
Itchy skin	3780	0	0
Dry skin	3741	39	1
Restless sleep in the last week	3668	112	3
SF-12 Physical Component Summary score	3326	454	12
SF-12 Mental Component Summary score	3326	454	12
CES-D score	3229	551	15

Supplemental Table 2: Patient characteristics of those who completed the patient questionnaire (PQ) and those who did not

Variable	No PQ				With PQ				p-value
	N	%	Mean	SD	N	%	Mean	SD	
Age	1312		66.5	14.2	3881		67.1	12.9	0.1569
Age, 4 categories									0.0077
<55	250	19.1			599	15.4			
55-64	256	19.5			773	19.9			
65-74	394	30.0			1306	33.7			
>=75	412	31.4			1203	31.0			
Female	555	42.3			1514	39.0			0.0353
Current smoker or stopped smoking within past year	172	13.7			424	11.1			0.0144
Married	527	55.5			2414	63.7			<.0001
Live Alone	155	16.4			748	20.1			0.0107
College degree and more	184	16.1			1178	38.0			<.0001
eGFR, ml/min	1312		27.6	12.3	3881		31.0	12.4	<.0001
Albumin- or protein-to-creatinine ratio (r)									<.0001
Normal (A1)	279	21.3			928	23.9			
High (A2)	228	17.4			926	23.9			
Very High or nephrotic (A3)	412	31.4			1316	33.9			
Missing	393	30.0			711	18.3			
CKD stage (r)									<.0001
Stage 3a	148	11.3			573	14.8			
Stage 3b	309	23.6			1313	33.8			
Stage 4	681	51.9			1715	44.2			
Stage 5	174	13.3			280	7.2			
Systolic Blood Pressure (SBP)	1174		138.0	20.6	3659		140.0	20.9	0.0054
Diastolic Blood Pressure (DBP)	1173		76.5	12.5	3656		77.2	12.2	0.1341
Cause of CKD (r)									<.0001
1.Diabetes	412	33.5			917	24.3			
2.Glomerular Disease	137	11.1			534	14.1			
3.Hypertension	377	30.7			1107	29.3			
4.Others	264	21.5			911	24.1			
5.Unknown	40	3.3			309	8.2			
Comorbidities									
Diabetes	647	49.3			1696	43.8			0.0005
Hypertension	1166	88.9			3381	87.1			0.0958
Congestive Heart Failure	212	16.2			535	13.8			0.0342
Cerebrovascular Disease	149	11.4			436	11.2			0.9034
Peripheral Vascular Disease	225	17.1			662	17.1			0.9390
Lung Disease	128	9.8			391	10.1			0.7394
Physician-diagnosed Depression	148	11.7			341	9.0			0.0059
Parkinson Disease	7	0.6			15	0.4			0.4769
History cirrhosis of the liver	22	1.7			54	1.4			0.4567
Recurrent Cellulitis, Gangrene	54	4.1			95	2.4			0.0018

Supplemental Table 3: Association of selected factors (with CKD stage 3 split into stage 3a and stage 3b) with the likelihood of having moderate-to-extreme pruritus in non-dialysis CKD patients

Characteristics	Adjusted Prevalence Ratio of having Moderate- to-extreme pruritus vs. no or mild pruritus (95% CI)	
	Limited Model	Full Model
Stage 3b (vs stage 3a)	1.20 (1.00 - 1.43)	1.18 (0.99-1.41)
Stage 4 (vs stage 3a)	1.21 (1.00 - 1.47)	1.18 (0.96-1.44)
Stage 5 (vs stage 3a)	1.39 (1.07 - 1.79)	1.35 (1.04-1.76)
Brazil (vs the US)	0.89 (0.69 - 1.14)	0.88 (0.68-1.13)
France (vs the US)	0.82 (0.71 - 0.95)	0.86 (0.74-0.99)
55-64 years old (vs <55 years old)	1.38 (1.12 - 1.70)	1.29 (1.05-1.58)
65-74 years old (vs <55 years-old)	1.52 (1.22 - 1.88)	1.39 (1.12-1.73)
≥75 years old (vs <55 years-old)	1.48 (1.19 - 1.83)	1.40 (1.12-1.74)
Male (vs female)	0.89 (0.78 - 1.01)	0.87 (0.76-0.99)
Albumin- or protein-to-creatinine ratio		
High (vs normal)		1.06 (0.89-1.26)
Very High or nephrotic (vs normal)		1.08 (0.92-1.28)
Diabetes (vs no)		1.17 (1.04-1.31)
Hypertension (vs no)		1.02 (0.83-1.25)
Congestive Heart Failure (vs no)		1.08 (0.94-1.24)
Peripheral Vascular Disease (vs no)		1.07 (0.93-1.24)
Lung Disease (vs no)		1.37 (1.18-1.59)
Physician-diagnosed Depression (vs no)		1.29 (1.10-1.52)
Recurrent Cellulitis, Gangrene (vs no)		1.17 (0.88-1.56)
History cirrhosis of the liver (vs no)		1.28 (0.92-1.78)

Results are based upon 3 countries of CKDopps (Brazil, France, and the United States) from a log-Poisson regression analysis adjusted for all selected factors in the full model. The limited model is adjusted for country, CKD stage, age, and sex. The full model is adjusted for country, CKD stage, age, sex, albumin-creatinine ratio, and comorbidities (diabetes, hypertension, congestive heart failure, peripheral vascular disease, lung disease, depression, recurrent cellulitis/gangrene, history of cirrhosis of the liver).

Supplemental Table 4: Association of selected factors and laboratory values with the likelihood of having moderate-to-extreme pruritus in non-dialysis CKD patients

Characteristics	Adjusted Prevalence Ratio of having moderate to extreme pruritus vs. no or mild pruritus (95% CI)
Stage 4 (vs stage 3)	0.97 (0.84-1.12)
Stage 5 (vs stage 3)	1.02 (0.82-1.27)
Brazil (vs the US)	0.88 (0.69-1.13)
France (vs the US)	0.90 (0.78-1.05)
55-64 years old (vs <55 years old)	1.30 (1.06-1.58)
65-74 years old (vs <55 years-old)	1.42 (1.15-1.75)
≥75 years old (vs <55 years-old)	1.41 (1.14-1.75)
Male (vs female)	0.93 (0.81-1.08)
Albumin- or protein-to-creatinine ratio	
High (vs normal)	1.07 (0.90-1.28)
Very High or nephrotic (vs normal)	1.06 (0.90-1.26)
<i>Comorbidities</i>	
Diabetes (vs no)	1.15 (1.02-1.28)
Hypertension (vs no)	1.03 (0.84-1.26)
Congestive Heart Failure (vs no)	1.08 (0.94-1.23)
Peripheral Vascular Disease (vs no)	1.06 (0.92-1.22)
Lung Disease (vs no)	1.33 (1.15-1.55)
Physician-diagnosed Depression (vs no)	1.26 (1.06-1.49)
Recurrent Cellulitis, Gangrene (vs no)	1.14 (0.85-1.53)
History cirrhosis of the liver (vs no)	1.17 (0.85-1.62)
<i>Laboratory Values</i>	
Serum phosphate, per 1 mg/dl higher	1.07 (1.00-1.15)
Serum calcium, per 1 mg/dl higher	1.01 (0.92-1.12)
Hemoglobin, per 1 g/dL higher	0.94 (0.90-0.98)

Results are based upon 3 countries of CKDopps (Brazil, France, and the United States) from a log-binomial regression analysis adjusted for CKD stage, country, age, sex, albumin-creatinine ratio, comorbidities (diabetes, hypertension, congestive heart failure, peripheral vascular disease, lung disease, depression, recurrent cellulitis/gangrene, history of cirrhosis of the liver) and laboratory values (phosphate, calcium, and haemoglobin). This model accounted for facility clustering effects.