



# VALIDATION OF KDQOL-SF™: A DIALYSIS TARGETED HEALTH MEASURE IN SINGAPORE

Joshi VJ<sup>1</sup>, Seow YY<sup>2</sup>, Thumboo J<sup>3</sup>, Lee AL<sup>1</sup>, Lim JFY<sup>1</sup>

<sup>1</sup>SingHealth Centre for Health Services Research, Singapore Health Services Pte Ltd.

<sup>2</sup>Department of Renal Medicine, Singapore General Hospital.

<sup>3</sup>Department of Rheumatology, Singapore General Hospital.

## BACKGROUND

- The prevalence of end-stage renal disease (ESRD) in Singapore is high and projected to increase sharply due to the aging population and the high prevalence of diabetes. The number of patients treated with dialysis was projected to rise from 2633 in 1999 to nearly 6000 in the year 2010<sup>1</sup>.
- There is growing acknowledgement that patients treated with hemodialysis experience significant psychosocial and lifestyle disturbances.
- Hence disease specific assessment of quality of life is important in the holistic evaluation of care of hemodialysis patients.
- The Kidney Disease Quality of Life (KDQOL) is a self reported measure developed for individuals with kidney disease or are on dialysis (Hays, Kallich, Mapes, Coons and Carter, 1994).<sup>2</sup>

## OBJECTIVE

To determine reliability and validity of Kidney Disease Quality Of Life Short form KDQOL-SF™ scoring in hemodialysis patients in Singapore.

## METHODS

- A cross sectional study
- The survey was administered at 22 National Kidney Foundation, Singapore (NKF) haemodialysis centres from Dec 2006 to Jan 2007
- 1980 patients were approached.
- The survey was conducted using KDQOL-SF™ version 1.3
- English, Chinese and Malay and Tamil versions were used.
- Inclusion criteria was:
  - Age > 18 years
  - Patients on hemodialysis for more than 3 months undergoing dialysis at an NKF dialysis center

KDQOL-SF™ was self administered. Trained nurses helped the patients when they had difficulty understanding the questions.

## What is KDQOL-SF™?

- Composed of short form SF-36 general health items (Physical and mental health and 1 item on overall health) across 8 domains.
- Includes additional 43 kidney specific items (questions).
- Scores range from 0 to 100 with 100 representing 'best' quality of life.

## Statistical /Psychometric analysis:

- Reliability analysis (internal consistency of items refers to how consistently individuals respond to the items within the scale) using Cronbach's coefficient Alpha was conducted. 0.7 or greater demonstrates high reliability.
- Factor analysis (Factor analysis is a powerful statistical technique that groups variables into conceptually meaningful clusters) to show construct validity. To assess how well a measure represents the construct of interest i.e to determine whether our data fits a factor structure identical to the structure found by other researchers.
- Correlation to assess stronger relationship of items within scales and weaker outside scale.

## RESULTS

- 1180 patients responded to the survey. Response rate was 1180/1980 = 59%.
- Full information of age, gender and race was available for 980 patients.

Table 1 Demographic Characteristics

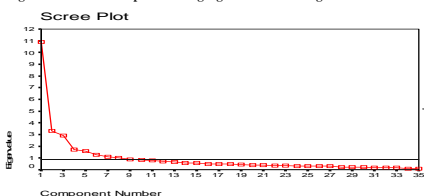
Variables	Sample		ESRD population in Singapore = 3403*	
Age (Years)				
<40	84	8.6%	0296	08.8%
40 – 50	213	21.7%	0705	20.7%
50 – 60	333	34.0%	1029	30.2%
>60	350	35.0%	1373	40.3%
Gender				
Male	550	56.1%	1713	50.1%
Female	430	43.9%	1690	49.9%
Race				
Chinese	668	68.2%	2525	74.2%
Malay	166	16.9%	641	18.8%
Indian	146	14.9%	204	6.6%
Others			30	1.0%

Table 1: Sample of dialysis patients surveyed in comparison with total dialysis population as per Singapore Renal registry 2004 (most current published dialysis data). Percentages in Table1 show that sample is representative of the current total dialysis population in Singapore. There were more males than females (56% vs 44%). About 70% of the patients were over 50 years of age. Respondent's mean age was 57 ± 21 years. About 2/3 patients were Chinese.

## Factor analysis:

Factor analysis revealed 68% of the total variance of the eight domains of the SF-36™. Scree plot in Figure 1 showed factor analysis with varimax rotation could get 8 factors for 8 scales of SF-36 items.

Figure 1 Scree plot showing eight factors with eigen value >1.



1. Physical functioning,
2. Role-physical,
3. Pain,
4. General Health,
5. Emotional well-being,
6. Role-emotional,
7. Social function,
8. Energy/fatigue

Table 2 Reliability and Factor loadings of 8 factors & mean for SF- 36 item health score using Cronbach's Coefficient Alpha

Items in each scale	Role physical	Physical functioning	Emotional well-Being	General health	Social function	Pain	Role emotional	Energy fatigue
<b>Reliability scores</b>	<b>0.89</b>	<b>0.95</b>	<b>0.85</b>	<b>0.77</b>	<b>0.74</b>	<b>0.92</b>	<b>0.66</b>	<b>0.72</b>
Vigorous activities		.663						
Moderate activities		.756						
Lifting carrying groceries		.682						
Climbing several flights of stairs		.807						
Climbing one flight of stairs		.686						
Bending, kneeling		.534						
Walking more than a mile		.731						
Walking several blocks		.699						
Walking one block		.537						
Bathing or dressing yourself		.280						
Due to physical health (refer to next 4 rows),								
Did you cut down amount of time on activities?		.852						
Accomplished less than what you would have liked		.872						
Were limited in the kind of activities		.861						
Had difficulty performing activities		.823						
Body pain during last 4 weeks						.858		
Did pain interfere your work						.794		
How would you rate your health?				.472				
I get sick easier than other people				.669				
I am as healthy as any one else				.769				
I expect my health to get worse				.592				
My health is excellent				.741				
Have you been nervous person			.620					
You felt so down that nothing could cheer you up.			.737					
Have you felt calm & peaceful?			.218					
Have you felt down hearted and blue?			.748					
Have you been a happy person?			.215					
Due to emotional problem (refer to next 3 rows)								
You had to cut down amount of time on activities						.803		
You accomplished less						.812		
Could not do activities as carefully as usual						.749		
To what extent your physical health & emotional problems (refer to next 2 rows)								
Interfered with your normal social life					.381			
Interfered with visiting friends, relatives					.451			
Did you feel full of 'pep'?							.774	
Did you have a lot of energy?							.694	
Did you feel worn out?							.339	
Did you feel tired?							.416	
<b>Mean ± Standard deviation</b>	59.94 ± 24.15	71.47 ± 42.25	77.28 ± 22.29	80.20 ± 19.05	71.53 ± 15.65	87.38 ± 24.14	69.48 ± 16.71	58.85 ± 16.71

Table 2: Most of the factor loading are high, e.g. Role physical, role emotional and Pain has factor loadings of >0.8. Correlations within scales were higher (>0.4) than correlations of items outside the scale (<0.4) (Result is not shown due to limited space)

Table 3 Correlation of overall health score with renal function to confirm validity of KDQOL

ESRD targeted Measures	Symptoms	Effect of kidney disease	Burden of kidney disease	Work status	Cognitive	Quality of social interaction	Sexual function	Sleep	Social support
<b>Correlation with *Overall health from SF-36 scales</b>	.348**	.322**	.276*	.211*	.360*	.244**	.262*	.374**	.213*

\* Overall health is calculated based on SF-36 scales. Calculations is not shown here; \*p<05, \*\*p<01.

Table 3: Significant correlation between overall health rating based on 8 scales of SF-36 and kidney disease measures.

## Limitations:

We did not have measures on clinical parameters. Therefore it was not possible to find the relations of SF-36 scores with clinical parameters.

## CONCLUSION

This is the first time KDQOL-SF™ has been used on hemodialysis patients in Singapore. The results demonstrate acceptable reliability and construct validity among hemodialysis patients. Investigators should feel confident using KDQOL-SF™ to assess quality of life among hemodialysis patients in Singapore.

## Future studies should

- Check the test re-test reliability of KDQOL-SF™ and look at the associations of quality of life with demographic characteristics.
- Capture clinical information to look for associations between QoL scores and clinical outcomes
- KDQOL can also be used among peritoneal dialysis patients and quality of life can be compared with hemodialysis.

## References:

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2. KDQOL-SF™ User's Manual, Version 1.3, RAND A Manual for Use and Scoring, Dec. 2007