Health-related Quality of Life (HRQOL) as an Outcome Measure in Primary Care

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HRQOL as an Outcome Measure in Primary Care

• Why is HRQOL an important outcome for primary care
• How can HRQOL be measured
• Applications in PC Research
Uniqueness of Primary Care

- Person-centered
- Biopsychosocial interaction
- Functional problems
- Chronic diseases
- Multiple morbidity
- Prioritization of resources
“Only a small fraction of modern health care is purely for cure. Most is provided in order to relieve symptoms, restore functioning or improve well-being. Therefore, such care is defensible only insofar as it improves quality of life.”

Najman and Levine 1981
Health Outcomes

- Patient Reported Outcomes
- Quality of life
- HRQOL
- Health status
- Morbidity (diseases, illness, impairment)
- Mortality/survival
How can HRQOL be measured?
Definition of HRQOL


“The impact of perceived health on an individual’s ability to live a fulfilling life.”
Core Concepts of HRQOL

(Wilson et al. JAMA 1995; 273:59-65)

- Subjective, i.e. person-centered
- Multi-dimensional
  - Functioning- physical, role & social
  - Mental (psychological) well-being
  - General health perception
  - Vitality
  - Symptoms, e.g. pain, insomnia
  - Cognition
HRQOL Measurement Theory

Latent Variable

Health-related Quality of Life

Domain (Scale)

Physical fitness

General health

Daily role functioning

Indicator (Item)

Running

Walking

Get sick easily

Health is good

Cut down work

Less careful
## SF-12 V2 Mental Health Items

(circle one on each line)

<table>
<thead>
<tr>
<th>How much of the time during the past 4 weeks have you...</th>
<th>All the time</th>
<th>Most of the time</th>
<th>Some of the time</th>
<th>A little of the time</th>
<th>None of the time</th>
</tr>
</thead>
<tbody>
<tr>
<td>• felt calm &amp; peaceful?</td>
<td>1 (5)</td>
<td>2 (4)</td>
<td>3 (3)</td>
<td>4 (2)</td>
<td>5 (1)</td>
</tr>
<tr>
<td>• felt downhearted?</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>
Scoring HRQOL

Item Score → Item Score → Item Score → Item Score → Item Score

Re-coding

Summation

Raw Scale Score → Raw Scale Score

Transformation

Scale Score → Scale Score

Conversion

Summary/preference Scores
HRQOL Profile Scores

SF-36 Norm-based Scores

US heart
HK heart

PF  RP  BP  GH  VT  SF  RE  MH
## Physical & Mental HRQOL Summary Scores

<table>
<thead>
<tr>
<th>Principal Factors</th>
<th>HK</th>
<th>US</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PC</td>
<td>MC</td>
</tr>
<tr>
<td>PF</td>
<td>●</td>
<td>○</td>
</tr>
<tr>
<td>RP</td>
<td>●</td>
<td>○</td>
</tr>
<tr>
<td>BP</td>
<td>●</td>
<td>○</td>
</tr>
<tr>
<td>GH</td>
<td>◎</td>
<td>◎</td>
</tr>
<tr>
<td>VT</td>
<td>◎</td>
<td>◎</td>
</tr>
<tr>
<td>SF</td>
<td>○</td>
<td>●</td>
</tr>
<tr>
<td>RE</td>
<td>○</td>
<td>●</td>
</tr>
<tr>
<td>MH</td>
<td>○</td>
<td>●</td>
</tr>
</tbody>
</table>

(● $r \geq 0.70$, ◎ $r<0.7$ and $>0.3$; ○ $\leq 0.3$)
HRQOL Summary Scores

US population
HK population

SF-36 Norm-based Scores
PCS=physical component summary; MCS=mental component summary
Health Preference
(Multi-attribute Utility Theory)

- QALY is the key element of cost-effectiveness analysis (NICE)
- Preference is the measure of the “Q” of QALY, on a 0 (death) to 1 (perfect health) scale
- Multi-attribute HRQOL outcomes can be converted into a composite preference index
  - each attribute of HRQOL is classified into levels
  - statistical modeling on measured preference of representative multi-attribute states enables the estimation of the preference of each attribute level
  - the preference of a multi-attribute outcome is a function of the preference of each attribute
SF-6D Classification of HRQOL

- **SF-6D Physical Functioning (PF)**
  1. Your health does not limit you in vigorous activities
  2. Your health limits you a little in vigorous activities
  3. Your health limits you a little in moderate activities
  4. Your health limits you a lot in moderate activities
  5. Your health limits you a little in bathing and dressing
  6. Your health limits you a lot in bathing and dressing

- **SF-6D Mental Health (MH)**
  1. You feel tense or downhearted and low none of the time
  2. You feel tense or downhearted and low a little of the time
  3. You feel tense or downhearted and low some of the time
  4. You feel tense or downhearted and low most of the time
  5. You feel tense or downhearted and low all the time
## SF-6D Attribute Preference Values

<table>
<thead>
<tr>
<th>Attribute</th>
<th>HK (n=582)</th>
<th>UK (n=249)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>1.000</td>
<td>1.000</td>
</tr>
<tr>
<td>PF2</td>
<td>-0.050</td>
<td>-0.060</td>
</tr>
<tr>
<td>PF3</td>
<td>-0.056</td>
<td>-0.020</td>
</tr>
<tr>
<td>PF4</td>
<td>-0.092</td>
<td>-0.060</td>
</tr>
<tr>
<td>PF5</td>
<td>-0.103</td>
<td>-0.063</td>
</tr>
<tr>
<td>PF6</td>
<td>-0.178</td>
<td>-0.131</td>
</tr>
<tr>
<td>RL2</td>
<td>-0.035</td>
<td>-0.057</td>
</tr>
<tr>
<td>RL3</td>
<td>-0.035</td>
<td>-0.068</td>
</tr>
<tr>
<td>RL4</td>
<td>-0.054</td>
<td>-0.066</td>
</tr>
<tr>
<td>SF2</td>
<td>-0.039</td>
<td>-0.071</td>
</tr>
<tr>
<td>SF3</td>
<td>-0.050</td>
<td>-0.084</td>
</tr>
<tr>
<td>SF4</td>
<td>-0.050</td>
<td>-0.093</td>
</tr>
<tr>
<td>SF5</td>
<td>-0.073</td>
<td>-0.105</td>
</tr>
<tr>
<td>Pain 2</td>
<td>-0.037</td>
<td>-0.048</td>
</tr>
<tr>
<td>Pain 3</td>
<td>-0.037</td>
<td>-0.034</td>
</tr>
<tr>
<td>Pain 4</td>
<td>-0.052</td>
<td>-0.070</td>
</tr>
<tr>
<td>Pain 5</td>
<td>-0.060</td>
<td>-0.107</td>
</tr>
<tr>
<td>Pain 6</td>
<td>-0.100</td>
<td>-0.181</td>
</tr>
<tr>
<td>MH 2</td>
<td>-0.038</td>
<td>-0.057</td>
</tr>
<tr>
<td>MH 3</td>
<td>-0.058</td>
<td>-0.051</td>
</tr>
<tr>
<td>MH 4</td>
<td>-0.088</td>
<td>-0.121</td>
</tr>
<tr>
<td>MH 5</td>
<td>-0.088</td>
<td>-0.140</td>
</tr>
<tr>
<td>VIT 2</td>
<td>-0.039</td>
<td>-0.094</td>
</tr>
<tr>
<td>VIT 3</td>
<td>-0.056</td>
<td>-0.069</td>
</tr>
<tr>
<td>VIT 4</td>
<td>-0.063</td>
<td>-0.069</td>
</tr>
<tr>
<td>VIT 5</td>
<td>-0.077</td>
<td>-0.106</td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>Score</td>
</tr>
<tr>
<td>-----</td>
<td>-----------------------------------------------------------------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>PF</td>
<td>Your health limits you a little in vigorous activities (level 2) = -0.05</td>
<td></td>
</tr>
<tr>
<td>RL</td>
<td>You accomplish less than you would like (level 3) = -0.035</td>
<td></td>
</tr>
<tr>
<td>SF</td>
<td>Your health limits your social activities none of the time (level 1) = 0</td>
<td></td>
</tr>
<tr>
<td>Pain</td>
<td>You have pain that interferes with your normal work a little (level 3) = -0.037</td>
<td></td>
</tr>
<tr>
<td>MH</td>
<td>You feel tense or downhearted and low a little of the time (level 2) = -0.038</td>
<td></td>
</tr>
<tr>
<td>VT</td>
<td>You have a lot of energy some of the time (level 3) = -0.056</td>
<td></td>
</tr>
</tbody>
</table>

SF-6D Preference of Health State 231323 = 1 - 0.050 -0.035 - 0 - 0.037 - 0.038 - 0.056 = 0.784
Applications in PC Research

A Universal Outcome Currency

Courtesy of photolibrary@hku.hk
Is primary care consultation effective?

<table>
<thead>
<tr>
<th>SF-36</th>
<th>Mean change (effect size) from baseline to 2 wk</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TCM (TWH)</td>
</tr>
<tr>
<td>N</td>
<td>290</td>
</tr>
<tr>
<td>PF</td>
<td>7.91 (0.33)*†</td>
</tr>
<tr>
<td>RP</td>
<td>17.76 (0.41)</td>
</tr>
<tr>
<td>BP</td>
<td>21.18 (0.63)*†</td>
</tr>
<tr>
<td>GH</td>
<td>5.89 (0.21)</td>
</tr>
<tr>
<td>VT</td>
<td>6.60 (0.28)</td>
</tr>
<tr>
<td>SF</td>
<td>5.47 (0.23)</td>
</tr>
<tr>
<td>RE</td>
<td>7.82 (0.18)</td>
</tr>
<tr>
<td>MH</td>
<td>4.66 (0.21)</td>
</tr>
<tr>
<td>PCS</td>
<td>7.48 (0.49)*†</td>
</tr>
<tr>
<td>MCS</td>
<td>0.87 (0.07)*†</td>
</tr>
</tbody>
</table>

Changes were all significant (p<0.05) except for MCS in TCM group

*,†,‡ denote significant differences between corresponding groups

Which chronic disease is more serious?

SF-6D Preference Index

Lam & Brazier et al. Quality of Life Research 2007
What is the impact of specific diseases?

HK Chinese Norm-based SF-36 Scores

- Heart
- Diabetes
- Mental

(Lam & Lauder et al. AP Fam Med 2003; 2:98-106)
Which treatment strategy is more effective for dyspepsia?

<table>
<thead>
<tr>
<th></th>
<th>SF36 PCS (0-100)</th>
<th>SF36 MCS (0-100)</th>
<th>SF-6D preference (0-1)</th>
<th>symptom (12-60)</th>
</tr>
</thead>
<tbody>
<tr>
<td>OGD (n=83)</td>
<td>2.42^</td>
<td>1.48</td>
<td>0.029^</td>
<td>-5.13^</td>
</tr>
<tr>
<td>HP test &amp; treat (n=74)</td>
<td>2.79^</td>
<td>3.94^*</td>
<td>0.063^*</td>
<td>-5.21^</td>
</tr>
<tr>
<td>Cisapride (n=72)</td>
<td>2.92^</td>
<td>0.13^*</td>
<td>0.026^*</td>
<td>-4.08^</td>
</tr>
</tbody>
</table>

^ Difference between baseline & wk 6 scores by paired t test p<0.05
• Difference between groups by 2-sample t tests p<0.05

(Hu & Lam et al. J of Gastroenterology & Hepatology 2002; 17: 545-551)
**Is antiviral drug treatment for hepatitis B carriers cost-effective?**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>No treatment</td>
<td>21,776</td>
<td>17.621</td>
<td>13.102</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LVD</td>
<td>25,945</td>
<td>17.963</td>
<td>13.365</td>
<td>0.263</td>
<td>15,812</td>
</tr>
<tr>
<td>ADV</td>
<td>34,279</td>
<td>18.231</td>
<td>13.571</td>
<td>0.469</td>
<td>26,626</td>
</tr>
<tr>
<td>ETV</td>
<td>36,311</td>
<td>18.292</td>
<td>13.619</td>
<td>0.517</td>
<td>28,114</td>
</tr>
</tbody>
</table>

LVD, Lamivudine; ADV, Adefovir; ETV, Entecavir; ICER, Incremental Cost Effectiveness Ratio

# Preference: HK Norm 0.79; HB Impaired liver function 0.75; compensated cirrhosis 0.71; decompensated cirrhosis 0.64; hepatocellular carcinoma 0.72

*ICER thresholds: US Medicare USD50K; NICE GBP 20K

(Lam et al. HHSRF #05060741 Report 2010)
Conclusions: HRQOL

- is a most valid outcome measure of primary care
- captures the essence of person-centered care
- is a universal outcome currency
- can be measured scientifically
- has a wide range of applications
Objective Outcome Indicators of QA in Family Practice

“Outcomes that should be emphasized are function, quality of life, patient satisfaction and cost-effectiveness of care but they may be very difficult to measure..... therefore reduces its feasibility”

Asia Pacific WONCA Conference, Bali 1990
Medline Publications/ Year
(“QOL” in Title, Abstract or Keywords)
Is OGD or HP test and treat more cost-effective?

<table>
<thead>
<tr>
<th></th>
<th>Cost / subject (US$)</th>
<th>Gain in SF-6D preference</th>
<th>Cost / QALY# (US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hu &amp; Lam et al, 1999</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OGD (n=83)</td>
<td>296</td>
<td>0.029</td>
<td>10200</td>
</tr>
<tr>
<td>HP test &amp; treat (n=74)</td>
<td>203</td>
<td>0.063</td>
<td>3230</td>
</tr>
<tr>
<td>Empirical cisapride (n=72)</td>
<td>97</td>
<td>0.026</td>
<td>3740</td>
</tr>
</tbody>
</table>

# Assuming treatment effect will last for 1 year;
(NICE ICER threshold/QALY ~ GBP20K (US$30K)