

Minimum Change in the Roland-Morris Questionnaire

Overview:

Straford et al identified the level of change in a patient's score from the Roland-Morris questionnaire for low back pain to detect a clinically significant clinical change. This can help the interpretation of the scores over time and to determine the effectiveness of an intervention. The authors are from McMaster University and North Georgia College.

Method 1: Figure for 90% Confidence

Minimal Detectable Change at 90% Confidence Level (Figure page 364 with initial score on X-axis and follow-up score on the Y-axis):

- if above upper line: deterioration
- if between the upper and lower line: unchanged
- if below the lower line: improvement

Line	Defining Points	Line Equation
lower	(0 0 – (4 0	$y = 0$
	(4 0 – (11 7	$y = x - 4$
	(11 7 – (12 7	$y = 7$
	(12 7 – (16 11	$y = x - 5$
	(16 11 – (17 13	$y = (2 * x) - 21$
	(17 13 – (24 20	$y = x - 4$
upper	(0 4 – (7 11	$y = x + 4$
	(7 11 – (8 13	$y = (2 * x) - 3$
	(8 13 – (12 17	$y = x + 5$
	(12 17 – (13 17	$y = 17$
	(13 17 – (20 24	$y = x + 4$
	(20 24 – (24 24	$y = 24$

Method 2: Based on Z-score (Appendix page 365)

$Z = ((\text{initial RMQ score}) - (\text{followup RMQ score})) / \text{SQRT} ((\text{variance for initial RMQ score}) + (\text{variance for followup RMQ score}))$

If $Z > 1.96$ then there is a 95% chance that there has been a significant change.

RMQ Score	Initial Visit Error Variance	Followup Error Variance
0	0.38	0.42
1	0.75	0.83
2	1.43	1.58
3	2.04	2.26
4	2.59	2.87
5	3.08	3.41
6	3.50	3.88
7	3.86	4.27
8	4.15	4.59
9	4.38	4.84
10	4.54	5.02
11	4.64	5.13
12	4.67	5.17
13	4.64	5.13
14	4.54	5.02
15	4.38	4.84
16	4.15	4.59
17	3.86	4.27
18	3.50	3.88
19	3.08	3.41
20	2.59	2.87
21	2.04	2.26
22	1.43	1.58
23	0.75	0.83
24	0.38	0.42

From Table 2 page 363

References: Stratford PW Binkley J et al. Defining the minimum level of detectable change in the Roland-Morris questionnaire. Physical Therapy. 1996; 76: 359-365