



Validation of the Michigan Hand Outcomes Questionnaire (MHQ) in Systemic Sclerosis (SSc)

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Abstract

Rationale:

Hand involvement is a universal feature of systemic sclerosis (SSc) and hand impairment is a key determinant of functional status in SSc. Validated outcome measures that are practical for SSc are lacking. The MHQ is a 37-item hand-specific outcomes questionnaire with 6 subscales: overall hand function, activities of daily living (ADL), pain, work performance, aesthetics, and patient satisfaction with hand function. The MHQ has been validated in rheumatoid arthritis (RA) and has face and content validity for application in SSc.

Methods and Patients:

Ambulatory SSc patients completed the MHQ along with SF-36 and SHAQ. 32 subjects underwent repeated testing (2 week interval) to assess test-retest reliability. MHQ responses were compared with detailed clinical measurements of SSc.

Results:

94 SSc patients were studied, including 47 with limited and 47 with diffuse SSc. 81 (86%) were female. Mean age was 51 y ± 12 and disease duration 7y ± 7. Test-retest reliability for MHQ was .84 (Spearman correlation), which ranged from .61 for aesthetic to .86 for ADL subscales. Internal consistency including overall MHQ and each subscales all scored > .80, except for a .62 correlation with aesthetic scale. Both limited and diffuse groups had similar internal consistency scores.

Conclusions:

The MHQ has test-retest reliability and good internal consistency in a large sample of SSc patients. MHQ has construct validity for SSc because its function and pain domains correlated with similar domains in SHAQ and the SF-36. The non-significant low correlation between the MHQ and the SF-36 mental scale is sensible, while the low correlation between the MHQ aesthetic domain and other functional domains adds to the construct validity of the aesthetic domain, which is often overlooked. The MHQ is a promising outcomes tool for SSc and its responsiveness will be tested in clinical trials.

Rationale

To examine the test-retest reliability and the concurrent validity of the MHQ in SSc patients.

- Hand involvement is universal in SSc
- Hand impairment is a key factor of functional status
- Hand specific hand function outcome measures do exist (e.g. Hand Mobility in Scleroderma Test, Arthritis Hand Function Test) but require training and special equipment
- A need exists for an easy to use hand specific function outcome measure in SSc
- The MHQ is a self-administered hand specific function outcome measure which has been validated across several disabilities and disease groups

Methods

Subjects

- 94 patients with diagnosis of SSc by ACR classification criteria
- Patient characteristics:
 - 47 patients with limited and 47 with diffuse SSc
 - Age: 51 y ± 12
 - Gender: 81 (86%) females
 - Duration of Disease : 7 y ± 7

Test-Retest:

- 32 patients completed repeated testing of the MHQ in a 2-week interval (similar in characteristics to the total group)

Instruments

- SHAQ
- SF-36
- MHQ

Disease Characteristics Grouping

- 1) tendon involvement: palpable tendon friction rubs/impaired fist closure
- 2) digital tip ulcerations
- 3) upper extremity skin score: fingers, hands, forearms; 0-3 per area, range 0-18
- 4) disease classification: Limited vs. Diffuse

Results

Test-Retest:

Table 1. Test-Retest Correlation for the Six Scales in the Michigan Hand Questionnaire SSc Patient Population (N=32)

	Intraclass Correlation
1. Overall Hand Function	.77
2. Activities of Daily Living	.86
3. Pain	.86
4. Work Performance	.81
5. Aesthetics	.61
6. Satisfaction with Hand Function	.84

- Test-retest reliability was .84 overall
- Test-retest reliability for subscales ranged from .61 (aesthetic) to .86 for ADL

Internal Consistency:

Table 2. Spearman's Correlation for the MHQ and Subscales in the Michigan Hand Questionnaire

	MHQ Combined	Overall Hand Function	Activities of Daily Living	Pain +	Aesthetics	Work Performance	Satisfaction
MHQ Combined	1.00	.85	.91	-.84	.62	.81	.87
Overall Hand Function		1.00	.82	-.66	.39	.58	.76
Activities of Daily Living			1.00	-.73	.42	.71	.77
Pain +				1.00	-.42	.64	-.70
Aesthetics					1.00	.46	.45
Work Performance						1.00	.61
Satisfaction Hand Function							1.00
SHAQ	-.65	-.56	-.70	.54	-.29	-.55	-.59

*All correlations are statistically significant at p<.0001
+ The negative sign in the pain scale indicates reverse scoring: patients with a higher pain score (more pain) have worse performance.

- Was >.80 for the overall MHQ score and all subscales with the exception of aesthetics which had a .62 for the aesthetics scale
- Internal consistency scores were similar for the limited and the diffuse SSc groups.

Construct Validity:

Spearman's Correlations between the MHQ, SHAQ, and subscales of SF-36

	SHAQ	SF-36 Physical+Pain	SF-36 Physical	SF-36 Pain	SF-36 Mental Health	SF-36 General Health
MHQ Combined	-.65*	.66*	.43*	.64*	-.26¶	-.38§
Overall Hand Function	-.56*	.55*	.39§	.56*	-.17 ^{NS}	-.33¶
Activities of Daily Living	-.70*	.68*	.51*	.60*	-.19 ^{NS}	-.41*
Pain +	.54*	-.58*	-.31±	-.65*	-.19 ^{NS}	-.27¶
Aesthetics	-.29±	.30±	.17 ^{NS}	.30±	.25¶	.17 ^{NS}
Work Performance	-.55*	.69*	.44*	.60*	-.36§	-.36*
Satisfaction Hand Function	-.59*	.55*	.37*	.54*	.25¶	-.39§

Lower scores on MHQ reflect higher impairment except for MHQ Pain where higher scores reflect higher pain levels
The negative sign in the pain scale indicates reverse scoring: patients with a higher pain score (more pain) have worse Performance.
* P < .00001; § P < .0001; ± P < .001; ± P < .01; P < .05, NS = Not Significant

- MHQ function domains show significant correlations with similar domains in SHAQ and SF-36
- MHQ pain domain showed significant correlation with similar domain in SF-36
- MHQ overall and subscales have no correlation with SF-36 Mental
- MHQ Aesthetics has very low correlations with function domains

Conclusions

- The MHQ has shown reliability and validity in this study of SSc patients.
- The MHQ shows promise as a measure of hand function in SSc patients.
- A major advantage of the MHQ is its ease of administration (patient self-report).
- The MHQ includes a measure of satisfaction with aesthetics which is often overlooked in SSc research. The results in this study show this to be a separate domain.
- Further studies are needed to test its responsiveness to measure change.

References

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