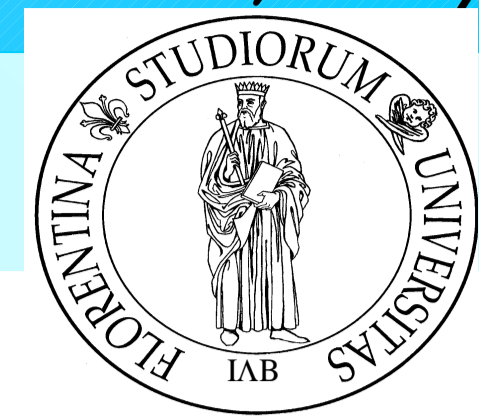


VALIDITY AND RELIABILITY OF THE ITALIAN VERSION OF THE HAND MOBILITY IN SCLERODERMA (HAMIS) TEST

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BACKGROUND

- In Systemic Sclerosis (SSc), skin induration and joint and muscle involvement lead to a progressive reduction in range of motion, that is a major determinant of handicap and disability and rehabilitative problems.
- In SSc, hand disability is frequent and mainly due to the typical flexion contractures of metacarpophalangeal joints, loss of extension of proximal interphalangeal joints, reduced motion of thumb and wrist and to arthralgias, arthritis, ulcers, calcinosis.
- Thus, specific tools reliably assessing hand-related handicap are mandatory to follow-up disease evolution and efficacy of pharmacological and rehabilitative interventions.
- Duruoz index (1) and Hand Mobility in Scleroderma (HAMIS) scale (2,3), assessing hand handicap and function, are also able to follow-up disease progression and therapy (4,5).
- HAMIS scale is a hand function test specifically developed for SSc patients evaluating movements and tasks of the hand that are part of daily occupations.
- HAMIS scale has not been translated and validated in Italian Language.

AIM

To validate the Italian version of HAMIS, by assessing its test-retest reliability, internal and external consistency, in Italian SSc patients

METHODS

40 SSc patients (8 dSSc, 32 ISSc; 5 men, 35 women; age and disease duration: 57.3±11.2 and 9.0± 3.8, years) were evaluated by HAMIS scale, Duruoz index, fist closure, Health Assessment Questionnaire (HAQ), SF-36 summary physical (SPI) and mental index (SMI), and skin score and examined for hand arthralgias, arthritis, flexion contractures, ulcers.

•HAMIS scale consists of 9 items assessing the movements included in an ordinary range of motion test, i.e., finger flexion and extension, abduction of the thumb, dorsal extension and volar flexion of the wrist, and pronation and supination of the forearm, the ability to make a thumb pincer grip and to make finger abduction. Each exercise is graded on a 0-3 scale (with 0 = normal function and 3 = inability to perform the task), with a score range of 0-27 for each hand (2-3). HAMIS was translated following a forward-backward translation procedure, with independent translations to Italian and counter-translation to English, according to international methodology (6).

•Test-retest reliability was evaluated comparing the results of the 1st and 2nd administration, by intra-class correlation coefficient (ICC), internal consistency by Cronbach's α and external consistency was assessed by comparison with Duruoz index, fist closure, and HAQ.

RESULTS

In SSc, HAMIS scale scores for right and left hands were 7,95±6,68 and 7,5±6,6 (p=NS), respectively (table I). For both hands, HAMIS scores were significantly higher in dSSc than in ISSc (table I). HAMIS scale showed a good test-retest reliability (ICCs>0.75) and internal consistency (Cronbach's α >0.7) for both hands. A good external consistency was confirmed by the correlation of right and left hand HAMIS with Duruoz index (rho: 0,8416; P<0.0001 and rho: 0,8135; P<0.0001, respectively), fist closure (rho: 0,8250; P<0.0001 and rho: 0,8026; P<0.0001, respectively), HAQ (rho: 0,5409; p: 0,0003 and rho: 0,5314; p: 0,0004 respectively). Right and left hand HAMIS also correlated with PSI (rho: -0,3627, p: 0,0214 and rho: -0,3744, p:0,0173, respectively) and MSI (rho: -0,3625, p: 0,0215 and p: 0,0214 and rho: -0,3744, p: 0,0318, respectively). Tables 2 and 3 show English and Italian MHISS version validated by us.

TABLE I: SSc patients characteristics

	SSc (40 pts)	dSSc (8 pts)	ISSc (32 pts)	P (dSSc vs ISSc)
Arthralgias	25	8	17	0.0016
Arthritis	5	4	1	0.045
Flexion contractures	10	4	6	NS
Ulcers	6	3	3	NS
Right hand HAMIS	7.95±6,7	15.0±7.7	6.19 ±5.2	0.0004
Left hand HAMIS	7.5 ± 6,6	15.0±7.6	5.62±4.9	0.0001
Duruoz index	24.0±21.8	44.0 ±23.9	19.03±18.5	0.0026
Right hand fist closure (cm)	1.66± 1.9	3.31± 2.2	1.23 ± 1.6	0.0056
Left hand fist closure (cm)	1.65± 1.9	3.29± 2.1	1.25 ± 1.5	0.0053
HAQ	0.82 ±0.92	1.43 ± 1.4	0.66 ± 0.7	0.0033
PSI (SF-36)	36.42±9.0	32.23±3.1	37.46±9.1	NS
MSI (SF-36)	40.91± 8.0	39.59±5.8	41.23±8.6	NS

Legend: HAMIS: Hand Mobility in Scleroderma scale; PSI: SF36 Physical Summary Index; MSI: SF36 Mental Summary Index

TABLE 2: HAMIS test English

- Finger flexion**
 (All fingers must be tight to the object)
- 0- Can bend fingers 2-5 around a pencil (5 mm diam)
 - 1- Can bend fingers 2-5 around a piece of cutlery (15 mm diam)
 - 2- Can bend fingers 2-5 around handlebar (30 mm diam)
 - 3- Cannot manage the previous item
- Finger extension**
- 0- Can feel the table completely with digits 2-5
 - 1- Can feel the pencil (5 mm diam) with digits 2-5
 - 2- Can feel the piece of cutlery (15 mm diam) with digits 2-5
 - 3- Cannot manage the previous item
- Thumb abduction**
- 0- Can grip around a coffee package (90 mm diam)
 - 1- Can grip around a milk parcel (70 mm diam)
 - 2- Can grip around a bottle (60 mm diam)
 - 3- Cannot manage the previous item

- Pincer grip**
- 0- Can form a round pincer grip
 - 1- Can form a D-shaped pincer grip
 - 2- Can form a long narrow pincer grip
 - 3- Cannot manage the previous item

- Finger abduction**
- 0- Can spread the fingers and then fold the hands together to the bottom of the fingers
 - 1- Can spread the fingers and then fold the hands together to the first phalanx
 - 2- Can spread the fingers and then fold the hands together to the second phalanx
 - 3- Cannot manage the previous item

- Volar flexion**
 (The person stands with the arms alongside the body. The object is given from behind)
- 0- Can grasp a spool of thread with a slight flexion of MCP and extended PIP and DIP joints
 - 1- Can grasp a spool of thread with a large flexion of MCP and extended PIP and DIP joints
 - 2- Can grasp a spool of thread with a large flexion of MCP and flexion of PIP
 - 3- Cannot manage the previous item

- Dorsal extension**
- 0- Can hold the palms together and put the wrists against the stomach
 - 1- Can hold the palms together and put the thumbs against the throat
 - 2- Can hold the palms together and put the thumbs up to the mouth
 - 3- Cannot manage the previous item

- Pronation**
- 0- Can put the palms of the hands on the table (MCP 2-5 must touch the surface)
 - 1- Can put the palms of the hands on the table (MCP 3-5 must touch the surface)
 - 2- Can put the palms of the hands on the table (MCP 4-5 must touch the surface)
 - 3- Cannot manage the previous item

- Supination**
- 0- Can put the backs of the hands on the table (MCP 2-5 must touch the surface)
 - 1- Can put the backs of the hands on the table (MCP 3-5 must touch the surface)
 - 2- Can put the backs of the hands on the table (MCP 4-5 must touch the surface)
 - 3- Cannot manage the previous item

TABLE 3: HAMIS test Italian

- Flessione delle dita**
 (tutte le dita devono essere serrate attorno all'oggetto)
- 0- Può piegare le dita 2-5 attorno ad una matita (5 mm diam)
 - 1- Può piegare le dita 2-5 attorno ad una posata (15 mm diam)
 - 2- Può piegare le dita 2-5 attorno ad un manubrio di bicicletta (30 mm diam)
 - 3- Non può svolgere il punto precedente
- Estensione delle dita**
- 0- Può sentire il tavolo completamente con le dita 2-5
 - 1- Può sentire la matita (5 mm di diametro) con le dita 2-5
 - 2- Può sentire la posata (15 mm di diametro) con le dita 2-5
 - 3- Non può svolgere il punto precedente
- Abduzione del pollice**
- 0- Può afferrare un pacchetto di caffè (90 mm di diametro)
 - 1- Può afferrare una confezione di latte (70 mm di diametro)
 - 2- Può afferrare una bottiglia (circa 60 mm)
 - 3- Non può svolgere il punto precedente

- Opposizione indice-pollice**
- 0- Può formare una pinza a cerchio con indice e pollice
 - 1- Può formare una pinza a forma di D con indice e pollice
 - 2- Può formare una pinza lunga e stretta
 - 3- Non può svolgere il punto precedente

- Abduzione delle dita**
- 0- Può aprire le dita e poi intrecciare le mani insieme fino alla base delle dita
 - 1- Può aprire le dita e poi intrecciare le mani insieme fino alla prima falange
 - 2- Può aprire le dita e poi intrecciare le mani insieme fino alla seconda falange
 - 3- Non può svolgere il punto precedente

- Flessione volare**
 (La persona è in piedi con le braccia lungo il corpo. L'oggetto viene dato da dietro)
- 0- Può afferrare un rocchetto di filo con leggera flessione delle MCF e con le articolazioni IFD e IFP estese
 - 1- Può afferrare un rocchetto di filo con ampia flessione delle MCF e con le articolazioni IFD e IFP estese
 - 2- Può afferrare un rocchetto di filo con ampia flessione delle MCF e con la flessione delle IFP
 - 3- Non è in grado di svolgere il punto precedente

- Estensione dorsale**
- 0- Può unire i palmi insieme e mettere i polsi contro lo stomaco
 - 1- Può unire i palmi insieme e mettere i pollici contro la gola
 - 2- Può unire i palmi insieme e mettere i pollici davanti alla bocca
 - 3- Non è in grado di svolgere il punto precedente

- Pronazione**
- 0- Può mettere il palmo delle mani sul tavolo (le MCF 2-5 devono toccare la superficie)
 - 1- Può mettere il palmo delle mani sul tavolo (le MCF 3-5 devono toccare la superficie)
 - 2- Può mettere il palmo delle mani sul tavolo (le MCF 4-5 devono toccare la superficie)
 - 3- Non è in grado di svolgere il punto precedente

- Supinazione**
- 0- Può mettere il dorso delle mani sul tavolo (le MCF 2-5 devono toccare la superficie)
 - 1- Può mettere il dorso delle mani sul tavolo (le MCF 3-5 devono toccare la superficie)
 - 2- Può mettere il dorso delle mani sul tavolo (le MCF 4-5 devono toccare la superficie)
 - 3- Non è in grado di svolgere il punto precedente

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CONCLUSIONS

HAMIS test is developed to measure specifically hand disability in SSc patients.

Our results support its validity and reliability in Italian SSc patients.

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