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Cross-cultural adaptation and validation of the Victorian Institute of Sports Assessment for Gluteal Tendinopathy questionnaire in Italian and investigation of the association between tendinopathy-related disability and pain

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ABSTRACT

BACKGROUND: The Victorian Institute of Sports Assessment for Gluteal tendinopathy (VISA-G) questionnaire has recently been proposed as a condition-specific patient reported outcome measurement tool to assess the tendinopathy-related disability.

AIM: To evaluate the reliability of the Italian version of the VISA-G questionnaire and its construct validity and to investigate the association between tendinopathy-related disability and pain.

DESIGN: Cross-sectional study.

SETTING: University laboratory.

POPULATION: Gluteal tendinopathy patients (n=38) and healthy controls (n=38).

METHODS: Subjects were asked to fill the VISA-G questionnaire twice to evaluate its reliability. The construct validity was evaluated by comparing the VISA score with the Oswestry Disability Index score. Moreover, pain intensity, extent and location were also investigated.

RESULTS: The VISA-G scores showed non-significant changes in the median values and the values of intraclass correlation coefficient showed very high correlation between the first and second administration (ICC > 0.90 in both populations). No significant correlations were found between VISA-G score and either pain extent (R= –0.05, P=0.76), or resting pain intensity (R= -0.13, P=0.45), or palpation pain intensity (R= 0.01, P=0.97). Conversely, a high (and significant) negative correlation was obtained between VISA-G score and Oswestry Disability Index score (R= -0.80, P<0.0001).

CONCLUSIONS: These results indicated that the VISA-G Italian version presents excellent test-retest reliability.

CLINICAL REHABILITATION IMPACT: The evaluation of gluteal tendinopathy-related disability through VISA-G can be useful for the prognostic assessment and/or follow-up of tendinopathy patients in combination with the pain drawing assessment of pain extent.

Keywords: greater trochanteric pain syndrome, International Physical Activity Questionnaire, Oswestry Disability Index, pain drawing, VISA-G.

INTRODUCTION

Gluteal tendinopathy, also known as greater trochanteric pain syndrome, presents with pain and tenderness over the greater trochanter that interfere with physical function and sleep. Clinical risk factors for development of this condition include older age, female gender, back pain, overweight/obesity, poor abductor hip function, altered gait parameters, and psychological distress.[1-3]

The Victorian Institute of Sports Assessment for Gluteal tendinopathy (VISA-G) questionnaire has recently been proposed as a condition-specific patient reported outcome measurement tool to assess the tendinopathy-related disability.[4] The VISA-G has the same structure of the VISA-P, VISA-A and VISA-H tools, which have been widely adopted to quantify the disability associated with patellar, Achilles and hamstring tendinopathy, respectively.[5-7] The VISA-G has excellent reliability and validity in gluteal tendinopathy patients,[4] as well as good responsiveness in patients undergoing hip abductor tendon repair.[8] The VISA-P and VISA-A questionnaires have been cross-culturally adapted to Italian,[9,10] and the VISA-G questionnaire has recently been adapted to Danish [11] and French [12] but no Italian version is currently available. Moreover, no previous study investigated the relationship between VISA-G and pain extent, although the association between pain extent and disability has already been found for other chronic musculoskeletal pain conditions such as neck pain [13] and low back pain [14] that may co-occur with gluteal tendinopathy.

Therefore, the aims of the present study were to: i) evaluate the reliability of the VISA-G Italian version (in gluteal tendinopathy patients and healthy subjects) and

its construct validity (in gluteal tendinopathy patients); ii) investigate the possible association between tendinopathy-related disability and extent of pain.

MATERIALS AND METHODS

Subjects

Thirty-eight patients [29 women and 9 men, median (1st–3rd quartile) age: 64.5 (54.5–76.0) years; body mass index: 24.5 (22.9–26.8) kg/m^2] and thirty-eight healthy controls [29 women and 9 men, median (1st–3rd quartile) age: 56.5 (53.2–64.0) years; body mass index: 23.5 (22.7–27.2) kg/m^2] were recruited and evaluated by a medical doctor.

Exclusion criteria were: hip osteoarthritis, neurological or systemic inflammatory diseases, lumbar spine nerve root signs, history of lumbar spine or ipsilateral hip joint surgery.[4] Inclusion criteria for patients were: lateral hip pain aggravated with activity and affected side lying position, for more than 3 months,[2,3] and clinical diagnosis of gluteal tendinopathy performed by a medical doctor and confirmed by the ultrasound evidence of one or more of the following findings: decreased and heterogeneous echogenicity of the gluteus minimus and/or medius tendons, tendon thickening, calcification at the tendon attachment with the greater trochanteric, cortical irregularities deep to the gluteal insertions, bursal fluid collection.[15]

Ethics approval (protocol n. 133282) was granted by Ethics Committee of the University of Turin (Italy), and the procedures were conducted according to the Declaration of Helsinki. All participants read an information sheet and signed an informed consent form prior to the study.

Study design and procedure

The original English version of the VISA-G [4] was first cross-culturally adapted so as to be used for evaluating Italian-speaking subjects (see below).

According to the COSMIN checklist,[16,17] reliability (internal consistency, test-retest reliability, and measurement error), validity, and floor and ceiling effects were evaluated. All subjects were asked to fill the questionnaire twice (median number of days between the first and second administration: 7 days in both populations; range: 7-8 days in healthy subjects, 7-22 days in gluteal tendinopathy patients) to evaluate its reliability. This reliability study design was chosen to prevent recall and to ensure that no clinical changes occurred between the two evaluation sessions. The construct validity of the VISA-G questionnaire was evaluated by comparing the VISA score (1st administration) with the Oswestry Disability Index score.

Moreover, the following assessments were also performed during the first administration of the questionnaires: physical activity (assessed in both groups through the Italian short version of the International Physical Activity Questionnaire - IPAQ short),[18] pain intensity, extent and location (assessed in only in the patient group as described below).[14]

Cross-cultural adaptation

The cross-cultural adaptation process was performed according to previously published guidelines (e.g., the translators worked independently from each other, the items were translated forward and backward, translations were reviewed by bilingual people) [16,19] and comprised the following five steps. Step 1 included

forward translation from English to Italian by two independent bilingual translators. Step 2 comprised the review of the versions produced by the two translators by a group of bilingual individuals, ensuring that the translation was acceptable to monolingual people, and their synthesis into one version. In step 3, the latter version of the questionnaire was translated from Italian back to English (back translation) by two independent bilingual translators. Step 4 comprised a consensus meeting of all individuals involved in the translation to review the back-translation and decide on the final version. Step 5 involved testing the final version (Table 1) in 10 consecutive subjects to examine the accuracy of wording and ease of understanding.

Assessments of physical activity and disability

The IPAQ short comprises seven items investigating different physical activity intensities (vigorous or moderate), the time spent walking and sitting (as a proxy for sedentary behavior) during the last 7 days.[20] Based on IPAQ results, three levels of physical activity were proposed in a categorical score:[18,20] 1) low physical activity level (sedentary subjects): IPAQ score below 600 MET*min/week; 2) moderate physical activity level (moderately active subjects): IPAQ score above 600 MET*min/week and below 3000 MET*min/week; 3) high physical activity level (active subjects): IPAQ score of at least 3000 MET*min/week.

The Italian version of the Oswestry Disability Index,[21] which has been previously cross-culturally adapted and validated,[22] was adopted to assess the pain-related disability, as follows: minimum disability (0-20%); moderate disability (20-40%);

severe disability (41-60%); cripping disability (61-80%); complete disability (81-100%). Although the Oswestry score is commonly adopted for the purposes of staging back pain patients and assessing the outcomes of back pain treatment, [21,22] this tool was used in the present study as well as in the original validation of the VISA-G [4] because it has previously been used to investigate the disability associated with gluteal tendinopathy and because no reference standard exists to the test the VISA-G against.[23-25]

Assessment of pain intensity, extent and location

Patients were asked to rate their pain intensity using a 11-point numerical rating scale (NRS), with 0 corresponding to "no pain" and 10 corresponding to "the worst imaginable pain". Resting pain intensity was assessed prior to any study procedures. Movement pain was assessed during active hip abduction/adduction, and palpation pain intensity was assessed during manual palpation of the greater trochanter. Pain intensity was classified as mild for NRS scores between 1 and 3, moderate for scores between 4 and 6, and severe for scores between 7 and 10.

Pain extent and location were assessed through a user-friendly digital device which includes a collection of body charts and automated analysis of the pain drawing, as previously described.[14] Briefly, patients were instructed to 'Please draw where you felt your usual pain during the last week on this body chart and try to be as precise as possible'. Patients were instructed to colour every part of the body where they perceived pain, independently from the type and the severity of pain. Pain extent was quantified as the number of pixels coloured inside the body chart perimeter,

while pain location was assessed through a pain frequency map (i.e., pain drawings of all patients were superimposed to obtain a map with different colours indicating different percentages of patients reporting pain in a specific area).

Statistical analysis

The Shapiro–Wilk test for normal distribution of the data failed, and non-parametric statistical tests were therefore used. The Mann-Whitney test and the Fisher's test were adopted for data comparison between healthy subjects and patients. Changes in the VISA-G scores between test and retest were analyzed with the Wilcoxon test to assess the presence of systematic bias.

Reliability (i.e., the degree to which the measurement is free from measurement error) was assessed as internal consistency, test-retest reliability, and measurement error.[16,17]

Internal consistency (i.e., the degree of inter-relatedness among questionnaire items) of the VISA-G questionnaire was determined through the Cronbach's alpha.

Test-retest reliability (i.e., the extent to which scores from the same patients are unchanged for repeated measurements over time) was evaluated using the intra-class correlation coefficient (two-way mixed, single measure ICC2,1). A sample size of at least 38 subjects (in each of the two groups of patients and healthy controls) was considered necessary for the test-retest reliability analysis, using the approximate method developed by Walter et al. [26] based on α=0.05 and β=0.20, indicating an expected level of reliability (ρ1) of 0.93 (average of the ICC values

obtained in the previous studies by Fearon et al.,[4] Jorgensen et al., [11] Beaudart et al.[12]) and a minimally acceptable level of reliability (ρ0) of 0.85.

Measurement error (i.e., the systematic and random error of a patient's score that is not attributed to true changes in the construct to be measured) was evaluated using: i) the standard error of measurement (SEM) that was calculated as follows: √mean square error term from the ANOVA,[27] ii) the smallest detectable change (SDC: i.e., the smallest individual change in a score that can be interpreted as a real change) that was calculated as follows: 1.96 x √2 x SEM.[27]

Floor and ceiling effects were assessed for each item score and for the global score and were considered to be present if the lowest or the highest score was achieved by more than 15% of the cases.

The Spearman analysis was used to test for correlations between VISA-G score and perceived disability, pain intensity, pain extent. The criteria used for the interpretation of ICC and Spearman's correlation coefficient were as follows: 0.00–0.25: no correlation; 0.26–0.49: low correlation; 0.50–0.69: moderate correlation; 0.70–0.89: high correlation; and 0.90–1.00: very high correlation.[28]

Data were expressed as median and 1st–3rd quartile. Threshold for statistical significance was set to P = 0.05. Statistical tests were performed with the IBM SPSS Statistics (version 20 - IBM Corporation, Armonk, NY, USA) software package.

RESULTS

No problems were encountered in the forward and backward translations of the questionnaire that followed the same structure of the other VISA tools (i.e., VISA-A and VISA-P) that have previously been cross-culturally adapted to Italian.[9,10]

Gluteal tendinopathy affected the right side in 22 patients (all patients were right side dominant): 14 of 38 patients were overweight, and 3 patients were obese, 1 patient had type 2 diabetes, 5 patients had dyslipidemia, 14 patients had hypertension, and 3 patients were smokers. Descriptive data of other clinical characteristics of patients and VISA-G scores of patients and healthy subjects (at both test and retest) are presented in Table 2.

The VISA-G scores showed overall non-significant changes in the median values (Table 2). As reported in Table 3, the ICC values showed very high correlation (>0.90) between the first and second administration in both populations of participants, in agreement with the results obtained in previous studies investigating the measurement properties of the English, [4] Danish,[11] and French [12] versions of the questionnaire. Table 3 also reports other reliability analysis results (Cronbach's alpha, SEM, SDC) obtained in the present study and in the previous investigations.[4,11,12]

No floor or ceiling effects were identified in the patient group for the total score and for five of the eight items (items number 1, 3, 4, 5, 8) with less than 15% of the cases scoring the minimum or maximum values (a floor effect was identified for items 2 and 7, while a ceiling effect was identified for items 2 and 6).

As expected on the basis of the previous studies,[4,11,12] a ceiling effect was identified in the control subjects with more than 15% of the cases scoring the maximum value both for the total score and for each of the eight items.

Pain-related disability was between minimum and moderate for most of the patients (27 of 38 patients showed Oswestry Disability Index scores below 40%). Pain intensity was between mild and moderate in resting conditions, and between moderate and severe during both movement and manual palpation of the greater trochanter.

Pain had a peritrochanteric distribution in all patients (red and orange areas in Figure 1), with no extension to the gluteal region in any patients, and with extension to the lateral thigh in one patient only.

No significant correlations were found between VISA-G score and either pain extent (R= –0.05, P=0.76), or resting pain intensity (R= -0.13, P=0.45), or palpation pain intensity (R= 0.01, P=0.97). Conversely, a high (and significant) negative correlation was obtained between VISA-G score and Oswestry Disability Index score (R= -0.80, P<0.0001) and a low (although significant) negative correlation was obtained between VISA-G score and movement pain intensity (R= -0.33, P=0.04).

The comparison of physical activity estimates between the two groups of subjects showed significantly (P<0.0001) lower values for patients [IPAQ score: 297.0 (161.3-396.0) MET*min/week] compared with healthy subjects [IPAQ score: 1862.0 (1065.4-3512.3) MET*min/week]. Consistently, the proportion of sedentary subjects was significantly (P<0.0001) higher in patients (29 of 38 patients: 76.0%) compared with healthy subjects (2 of 38 subjects: 5.0%), while the proportions of

moderately active and active subjects were significantly (P<0.001 for both comparisons) lower in patients (8 of 38 patients were moderately active and 1 of 38 patients was active: 21.5% and 2.5%, respectively) compared with healthy subjects (23 of 38 patients were moderately active and 13 of 38 patients were active: 60.5% and 34.5%, respectively).

DISCUSSION

This study tested the reliability and validity of the cross-culturally adapted Italian version of the VISA-G questionnaire, and investigated the possible association between tendinopathy-related disability and pain. The VISA-G Italian version has excellent test-retest reliability, with ICC values (>0.90 for both healthy and pathological subjects) comparable to those obtained for the Danish [11] and French [12] versions and higher than the ICC value (0.83) obtained for gluteal tendinopathy patients studied in the original validation of the questionnaire.[4] A possible explanation for this difference is that the time interval between the two administrations of the questionnaire was shorter in our study (median: 7 days, range: 7-22 days) compared with the original study (median interval: 7 days, range: 7-47 days).[4]

Another difference between the present and the previous study [4] is the result of the construct validity assessment. In fact, we found in the patient group a significant negative correlation (correlation coefficient = -0.80) between the VISA-G score and the Oswestry Disability Index score, while no significant correlation between the two scores (the correlation coefficient was 0.20 in patients and -0.30 in healthy

subjects) was found in the previous study.[4] On this basis, Fearon et al.[4] suggested that the VISA-G measures gluteal tendinopathy-related disability rather than low back pain-related disability. Gluteal tendinopathy patients with non-specific low back pain were not excluded from both the previous and the present study. Therefore, a clinical variability between the two patient populations is a possible explanation for the discrepancy between the construct validity assessment of the two studies. We recruited gluteal tendinopathy patients presenting greater severity and variability of the perceived pain-related disability [median (1^{st}-3^{rd} quartile) values of the Oswestry Disability Index score: 28 (16.5-42.0)%] compared to the patients recruited in Fearon et al.'s study [mean (95% CI) values of the Oswestry Disability Index score: 11.3 (9.0 – 13.6)%].[4] Therefore, our findings not only confirm that the VISA-G and the Oswestry Disability Index assess different disability profiles, but also indicate that tendinopathy-related disability and low back pain-related disability can be co-occurring disorders that mutually condition one another.

Other conditions that we found associated with (and that may predispose to) gluteal tendinopathy were female gender, older age, and sedentary behavior. The over-representation of females and older individuals in the present investigation is probably related to the higher incidence of this disorder in women compared with men, and in older compared with younger adults. A possible explanation underlying the association between sedentary behavior and tendinopathy is that tendinopathy-related pain limits the physical activity of patients. Alternatively, it may be proposed that the sedentary behavior may contribute to the development of tendinopathy. The association between inactivity and tendinopathy could, in turn, be underlain by

the association between inactivity and body composition impairment (17 of 38 patients were overweight or obese in the present series). In fact, visceral and ectopic adiposity are linked to an increase in pro-inflammatory cytokines that may influence tissue homeostasis by influencing tendon repair rates.[29,30]

To our knowledge, this is the first study that investigated the pain distribution in gluteal tendinopathy patients and the possible association between tendinopathy-related disability and pain extent. The observation that pain had a peritrochanteric distribution in all the patients in the present investigation confirms the typical clinical presentation of this disorder, and highlights the relevance of accurate physical examination of gluteal tendinopathy patients. In fact, different imaging biomarkers may precede (and predict) the development of tendinopathy and may also co-occur with peritrochanteric pain, but only the presence of pain provides a clean-cut diagnostic distinction between the different pathophysiological stages of the disorder (i.e., the subclinical and overt tendinopathy). Therefore, pain distribution as well as its extent should be systematically investigated in gluteal tendinopathy patients. The lack of association between tendinopathy-related disability and the extent of perceived pain is an original observation of the present study, and suggests that the factors underlying the perceived disability differ from those underlying the perceived pain extent.

Although the software adopted to compute pain extent eliminates estimation errors, there are some methodological issues that should be considered. First, we collected data from a sample of 38 patients, which may be considered a small sample. Second, we did not investigate the presence of psychological features that can be associated

with abnormal pain drawings in individuals with chronic pain.[31,32] Third, we collected from the patients a single pain drawing during a single evaluation session. Nevertheless, the reliability of pain drawing analysis for the assessment of pain extent has been previously demonstrated.[14] Notwithstanding these limitations, we showed that pain drawings may constitute an easily feasible approach for pain assessment in gluteal tendinopathy patients and we suggest that the pain extent and VISA-G scores could represent independent predictors of response to treatment in these patients. Treatment response predictors are symptomatic and physiologic characteristics of patients that emerge early in the course of treatment. Leuchter et al.[33] proposed the term "response endophenotypes" to describe this class of predictors which consist in latent measurable symptomatic or neurobiologic responses of individual patients that carry strong predictive power for individual patient outcomes. Future studies are required to examine the prognostic value and the responsiveness to change (as well as to establish the minimal clinical difference) of pain extent and VISA-G scores in large populations of gluteal tendinopathy patients.

CONCLUSIONS

The findings in this study indicated that the VISA-G Italian version presents excellent reliability and provides a measure of gluteal tendinopathy-related disability that can be useful for the prognostic assessment and/or follow-up of tendinopathy patients in combination with the pain drawing assessment of pain extent.

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Data _____ **Valutazione iniziale** ☐ **Valutazione finale** ☐

Nome _____ **Cognome** _____

Età _____ **Peso** _____ **Statura** _____

1) Il mio solito dolore all'anca è:	*10 9 8 7 6 5 4 3 2 1 0* Nessun dolore | ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ | Dolore forte 0 1 2 3 4 5 6 7 8 9 10
2) Posso rimanere sdraiato sulla mia anca dolente:	*10* ☐ Per più di 1 ora *7* ☐ Tra 30 e 60 minuti, poi devo cambiare posizione *5* ☐ Tra 15 e 30 minuti, poi devo cambiare posizione *2* ☐ Tra 5 e 15 minuti, poi devo cambiare posizione *0* ☐ Non posso affatto rimanere sdraiato sul lato dolente
3) Camminare in salita o in discesa su una rampa di scale:	*10* ☐ Utilizzo normalmente le scale, senza avvertire dolore all'anca *7* ☐ Utilizzo normalmente le scale, ma avverto lieve dolore all'anca *5* ☐ Utilizzo normalmente le scale, ma tenendomi alla ringhiera a causa del dolore all'anca

	2 ☐ Tra 5 e 15 minuti, poi devo cambiare posizione *0* ☐ Non posso affatto utilizzare le scale a causa del dolore all'anca
4) Camminare in salita o in discesa su una rampa o una pendenza:	*10* ☐ Cammino normalmente in salita o in discesa, senza avvertire dolore all'anca *7* ☐ Cammino normalmente in salita o in discesa, ma avverto un leggero dolore all'anca *5* ☐ Ho lievi difficoltà nel camminare in salita o in discesa, a causa del dolore all'anca *2* ☐ Ho importanti difficoltà nel percorrere una rampa o una pendenza, a causa del dolore all'anca *0* ☐ Non posso affatto camminare in salita o in discesa, a causa del dolore all'anca
5) Dopo aver mantenuto per 30 minuti una posizione seduta, muoversi per alzarsi e poi camminare è:	*10* ☐ Possibile senza problemi *7* ☐ Difficoltoso per alcuni passi *5* ☐ Devo rimanere in piedi per qualche momento, prima di iniziare a camminare *2* ☐ Devo rimanere in piedi per meno di 20 secondi, prima di

	iniziare a camminare *0* ☐ Devo rimanere in piedi per più di 20 secondi, prima d iniziare a camminare
6) Lavori domestici o giardinaggio (o attività simili):	*10* ☐ Posso fare lavori domestici e/o giardinaggio per 1 ora o più *7* ☐ Posso fare lavori domestici e/o giardinaggio per intervalli di 30-60 minuti, a causa del dolore all'anca *5* ☐ Posso fare lavori domestici e/o giardinaggio molto limitatamente, a causa del dolore all'anca *2* ☐ Posso fare limitatamente lavori domestici ma non giardinaggio, a causa del dolore all'anca *0* ☐ Non posso affatto fare lavori domestici e/o giardinaggio
7) Svolge regolarmente esercizio, attività fisica o sport?	*10* ☐ Sì, posso fare esercizio come al solito *7* ☐ Un po' meno esercizio del solito *4* ☐ Molto meno esercizio del solito *0* ☐ No, non posso fare esercizio, non voglio o non ho tempo
8) Questa domanda ha 3 sezioni. Risponda solo alla sezione A, oppure B oppure C *Il suo attuale dolore all'anca interferisce con la sua capacità di*	

svolgere attività in carico (camminare, fare la spesa, correre, chinarsi, eseguire un affondo)?	
8A) Il mio dolore all'anca è così forte da impedirmi di camminare, fare la spesa, correre o svolgere altra attività in carico. Se questo è il caso, per quanto tempo svolge quotidianamente queste attività?	*0* ☐ Mi muovo solo in casa, senza svolgere altra attività in carico *2* ☐ < 10 minuti *5* ☐ Tra 10 e 19 minuti *7* ☐ Tra 20 e 29 minuti *10* ☐ ≥ 30 minuti
8B) Il mio dolore all'anca è presente durante l'attività fisica, ma non è così forte da impedirmi di camminare, fare la spesa, correre o svolgere altra attività in carico. Se questo è il caso, per quanto tempo svolge quotidianamente queste attività?	*0* ☐ Mi muovo solo in casa, senza svolgere altra attività in carico *5* ☐ < 10 minuti *10* ☐ Tra 10 e 19 minuti *15* ☐ Tra 20 e 29 minuti *20* ☐ ≥ 30 minuti
8C) Non avverte dolore durante l'attività fisica come camminare, fare la spesa, correre o svolgere altra attività in carico. Se questo è il caso, per quanto tempo svolge quotidianamente queste attività?	*6* ☐ Mi muovo solo in casa, senza svolgere altra attività in carico

	12 ☐ < 10 minuti *18* ☐ Tra 10 e 19 minuti *24* ☐ Tra 20 e 29 minuti *30* ☐ ≥ 30 minuti

Table 1. Italian version of the VISA-G questionnaire. Scoring numbers are reported in italic.

	Patients (n=38)	Healthy subjects (n=38)
Resting pain intensity (0-10)	4 (0.0-5.0)	-
Movement pain intensity (0-10)	6 (4.0-6.8)	-
Palpation pain intensity (0-10)	7.0 (5.3-8.0)	-
Oswestry Disability Index (0-100%)	28.0 (16.5-42.0)	-
Pain extent (pixels)	11770.5 (8277.5-29213.5)	-
VISA G - test (0-100)	54.0 (34.2-63.0)	100 (94.2-100)
VISA G - retest (0-100)	51.5 (37.5-66.5)	100 (94.2-100)
Wilcoxon test (P value)	0.21	0.67

Table 2. Median (1^{st}-3^{rd} quartile) values of clinical characteristics of patients and VISA-G scores of healthy subjects and patients (at both test and retest).

Variables	English version [4]	Danish version [11]		French version [12]	Italian version	
Sample size	26 patients	49 patients	58 controls	52 patients + 54 controls	38 patients	38 controls
ICC(2,1)	0.827	0.96	0.98	0.99	0.91	0.95
Cronbach's alpha	0.52	0.98	0.86	0.81	0.79	0.43
SEM	1.883	0.60		1.64	4.1	
SDC	-	3.17		4.55	11.4	

Table 3. VISA-G questionnaire reliability analysis results. ICC: intra-class correlation coefficient; SEM: standard error of measurement; SDC: smallest detectable change.

FIGURE CAPTION

Figure 1

Pain frequency map for the whole group of 38 patients. The colour bar represents the frequency of coloured areas. Red and yellow represent, respectively, the most and less frequently reported areas of pain.

Perc: percentage of patients.

Perc.	N. Subjects	N. Pixel
87%	33	29
79%	30	729
71%	27	779
61%	23	930
53%	20	1195
45%	17	1319
37%	14	1297
29%	11	2484
18%	7	2352
11%	4	9094
3%	1	43424