

# How to assess appearance distress and motivation in plastic surgery candidates: Italian validation of Derriford Appearance Scale 59 (DAS 59)

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**Abstract.** – **OBJECTIVE:** The Derriford Appearance Scale (DAS) 59 was specifically designed to measure psychosocial adjustment in patients with appearance problems. Previous studies using the DAS59 have proven it to be a reliable method of assessing the appearance-related quality of life after plastic surgery procedures. The aim of this study was to develop a valid and reliable Italian version of the DAS59.

**PATIENTS AND METHODS:** The first Italian translation of this questionnaire was conducted according to the DAS59 protocol that was designed by the original authors of the questionnaire. Eight hundred patients participated in this study and filled out three questionnaires (DAS59, General Health Questionnaire (GHQ)12 and Beck's Depression Inventory (BDI)-II). There were 400 adult patients with a history of previous plastic surgeries and 400 adult patients without any personal history of previous plastic surgery procedures. A total of 50 patients were selected randomly for test-retest analysis.

**RESULTS:** The overall internal consistency was excellent ( $\alpha = 0.95$ ) and equal to that of the original article that first described the scale. There was a good correlation between all the items. Domains demonstrated good internal consistency (Cronbach's alpha) and correlation within themselves. The construct validity of the Italian DAS59 was assessed under convergent validity that confirmed the correlation with scales related to other psychological conditions. GHQ12 showed relevant correlation with DAS59, while BDI-II did not.

**CONCLUSIONS:** A valid and reliable Italian DAS59 version was developed that can be used for research and clinical assessment of patients with appearance problems and concerns, especially before and after plastic surgery procedures.

## Key Words

Questionnaire, Quality of Life, DAS59, Cosmetic, Plastic surgery, Epidemiology.

## Introduction

Assessment of changes in quality of life after surgery and exact identification of each patient's perception of body image pre- and post-surgery are essential considerations for the surgeon because the success of the surgical or medical procedure mainly depends on patient satisfaction<sup>1,2</sup>. Research in this field has been hindered by the absence of an outcome measure to evaluate patient satisfaction and health-related quality of life. The Derriford Appearance Scale (DAS)59 is an instrument to scientifically and reliably evaluate the variation of the quality of life after plastic and reconstructive surgery procedures. The Derriford Appearance Scale was specifically designed to measure the psychosocial adjustment in patients with appearance problems. This scale has demonstrated excellent reliability and validity and has been used in a general population with no appearance concerns, general population with appearance concerns, and clinical population with appearance problems. There are two versions of the scale: a short version which consists of 24 items basically meant for routine use in clinical practice and an elaborate 59 item version meant for research and detailed assessment<sup>3-5</sup>. This scale has demonstrated excellent psychometric properties when translated and validated internationally<sup>6-9</sup>.

Before applying any psychometric tool to different ethnic population settings, it should be translated, validated and adapted according to local cultural and social needs.

There is no legislation in the European Union that addresses validation of a questionnaire. No directives on this issue were ever addressed to the member states, via the common legislative procedure (European Council and European Parliament together), or with the least common form of the special legislative procedures (sole legislator, the European Council).

According to the Alexandrine grammarians' adage, "to translate is to betray"; thus, we did not just develop an Italian version of the questionnaire, rather we tested it to look for patterns of recurrence, meaningful correlations and good homogeneity.

Therefore, the aim of this study was to develop a valid and reliable Italian version of the DAS59 according to the development protocol that was used by its authors.

## Patients and methods

### *The Italian Version of the DAS59*

The first Italian translation of this questionnaire was conducted in February-March 2010 according to the protocol of the DAS59 designed by the original authors of the questionnaire<sup>10</sup>.

Regarding the methodology, the translation protocol included the following stages:

- 1) Translation from English to the second language by a native of the other country who is fluent in English.
- 2) Back translation from the second language to English by a native English speaker who is fluent in the second language.
- 3) Iterations of (1) and (2) above until (2) produces a back translation similar to the original DAS.
- 4) Pilot a group of appropriate participants to gather feedback on the "usability" of the translated scale.
- 5) Data analysis and interpretation.

### *The Questionnaire*

The DAS59 is presented as a series of 59 statements and questions with multiple possible answers made to measure the frequency of symptoms (almost never .... almost always) and levels of discomfort (not at all distressed .... extremely distressed). It is intended for use in adults (16 years of age and above). An introductory section

collects demographic information and identifies the characteristics of the body part to which the subject feels most sensitive. This is referred to as a "characteristic" of the respondent in the remainder of the questionnaire. The questionnaire also identifies other characteristics of physical appearance about which the subject has concerns. Fifty-seven items rate the extent of psychological distress and dysfunction, and two items are intended to investigate pain and physical dysfunction. The test was designed to be used by clinical and scientific professionals from related areas of plastic surgery, dermatology, clinical psychology and psychiatry and nursing<sup>11</sup>.

The DAS59 generates six measures of psychological distress and dysfunction (an overall, full-scale score and five factorial scores) as well as a measure of physical distress and dysfunction (items 25 and 26). The five domains are 1) general self-consciousness of appearance (GSC), 2) social self-consciousness of appearance (SSC), 3) sexual and body self-consciousness of appearance (SB-SC), 4) negative self-concept (NSC) and 5) facial self-consciousness of appearance (FSC).

### *Sample Size Calculation*

Using Bonnett's Formula with an alpha of 0.05 and a power of 90%, the sample size of internal consistency for the Cronbach's alpha was calculated, and a sample size of 800 subjects was determined. Ethical clearance was obtained from the Institutional ethical review board, and guidelines from the Declaration of Helsinki were followed.

### *Clinical Sample*

Adult patients with a personal history of previous plastic and reconstructive surgical procedures were recruited from general practice clinics in Naples. Procedures include facial plastic surgeries (blepharoplasties, otoplasties, rhinoplasties), cosmetic and remodeling non-oncologic breast surgeries, liposuctions, abdominoplasties, and abdominal hernia repairs. We were able to enroll 400 patients aged between 18-70 years old (mean 31.5 years; standard deviation: 8.6). There were 218 females and 182 males.

### *Non-Clinical Sample*

Four hundred adults between 18-70 years (mean 36.7 years; standard deviation 14.4) who were not concerned about their appearance and had no personal history of previous plastic surgery procedures were recruited from general practice clinics in Naples. There were 225 males and 175 females.

### The study

A total of 800 patients participated in this study by filling out the questionnaire, which took approximately 35 minutes, under the supervision of a research assistant who did not interfere with the privacy of the patient. There were 393 females and 407 males.

A total of 50 patients (from the clinical sample) were selected randomly for test-retest analysis.

The questionnaires that were completed consisted of the following:

- 1) Italian version of DAS59 consisting of 59 items. Each item response is marked based on a four-point Likert scale from 1 to 4, with 1 indicating "almost never" and 4 indicating "almost always."
- 2) General health questionnaire (GHQ)12 consisting of 12 items. Each item response is marked based on a four-point Likert scale from 1 to 4, with 1 indicating "not at all" and 4 indicating "much more than usual." The GHQ12 is a 12 items scale that is used to assess mental health status, especially in the detection of emotional disorders such as stress/anxiety. The scoring is done on a Likert scale. The translated and validated Italian version is available<sup>12</sup>.
- 3) Beck's depression inventory (BDI)II: consists of 21 items. In BDI-II each item response is marked based on a four-point Likert scale from 0 to 3. BDI-II is a scale used to assess depression symptoms. Items are scored on a Likert scale. The translated and validated Italian version is available<sup>13</sup>.

### Statistical Analysis

The data was entered in SAS Version 8.4. Reliability of the scale was tested by Cronbach's alpha coefficient and coefficient of correlation. The retest reliability was also tested using Spearman's correlation coefficient between items and scale total score. Assessing the differences between those who were not concerned about body appearance and those who sought treatment for appearance problems using the Mann-Whitney test tested discriminant validity. Assessing the correlation between DAS59 with GHQ12 and BDI-II scales tested convergent validity.

## Results

### Reliability

The scale demonstrated excellent reliability and internal consistency as shown by an overall Cronbach's alpha value of 0.951 (Table I).

**Table I.** Reliability and internal consistency of DAS59.

Scale	Cronbach's alpha
DAS59	0.951
GSC	0.912
SSC	0.892
SBSC	0.822
NSC	0.674
FSC	0.733

Derriford appearance scale (DAS) 59, general self-consciousness of appearance (GSC), social self-consciousness of appearance (SSC), sexual and body self-consciousness of appearance (SBSC), negative self-concept (NSC), facial self-consciousness of appearance (FSC).

### Test-Retest Reliability

The DAS59 test-retest correlation coefficient was very low (Pearson  $r = 0.27$ ). When the test-retest reliability was computed independently for the two sexes, two dramatically different results were obtained. Females showed a statistically significant test-retest correlation (Pearson  $r = 0.48$ ; Spearman = 0.47,  $p < 0.025$ ), while males demonstrated a total independence between the two phases: (Pearson  $r = 0.04$ /Spearman = 0.08).

## Validity

Discriminant validity was confirmed by the significant differences between the two groups (non-clinical and clinical sample) (Table II). Only the GHQ12 scale demonstrated a relevant correlation with DAS59 (Table III).

**Table II.** Validity of DAS59.

	Wilcoxon two-sample statistic	p (two-sided Z approximation)
DAS59	139605.50	0.0005*
GSC	146939.50	0.0133*
SSC	149911.00	0.0113*
SBSC	161686.50	<0.0001*
NSC	155674.00	0.4828
FSC	175080.50	<0.0001*
BDI-II	136723.50	<0.0001*
GHQ-12	141143.00	0.02*

Derriford appearance scale (DAS) 59, general self-consciousness of appearance (GSC), social self-consciousness of appearance (SSC), sexual and body self-consciousness of appearance (SBSC), negative self-concept (NSC), facial self-consciousness of appearance (FSC), Beck's Depression Inventory (BDI)-II and General Health Questionnaire GHQ12. Z includes a continuity correction of 0.5. \*Statistical significance

**Table III.** Correlations between DAS59, BDI, and GHQ12 (Spearman Rho).

	DAS59	BDI-II	GHQ12
DAS59	1.0	0.141	0.041*
BDI-II		1.0	0.367
GHQ12			1.0

Derriford appearance scale (DAS) 59, Beck's Depression Inventory (BDI)-II and General Health Questionnaire (GHQ)12. Only GHQ12 has a relevant (albeit minor) correlation with DAS. \*Statistical significance.

## Discussion

Outcomes in plastic surgery have traditionally been evaluated using objective clinical measures, such as morbidity, post-surgical complications, narrowly defined functional results (e.g. range of motion) and objective measures of cosmetic results. Although these provide important data to clinicians and researchers, the limitations of using clinical outcome measures alone have been noted. Many surgical procedures have a low impact on the mortality rate and many technologies aim to prevent, cure or alleviate the effects of diseases and conditions that are not life-threatening. In plastic surgery, it has been suggested that patient-based outcome measurements (like questionnaires, interview schedules or any associated way of quantifying health-related variables from the patient's perspective), may be one of the most important methods of evaluation of the patient quality of life after surgery. The quality of Life (QOL) has become a standard measure in assessing the effectiveness of medical interventions. QOL-based outcome assessments are extremely important in cosmetic surgery because patient satisfaction is the predominant factor by which success is defined. Until though recently, it has been difficult to substantiate these contentions in an objective fashion. The past decade, however, has seen an explosion of interest in QOL assessment tools as a surrogate measure for overall benefit from health interventions<sup>14</sup>. A series of measures related to health QOL are now available, most of which are instruments with generic voices, not specifically created for patients undergoing cosmetic surgery and they may underestimate specific effects of body alterations resulting from these procedures. A known limitation of these generic tools for assessing QOL is the lack of sensitivity in the detection of changes in healthy subjects. In these patients, the main purpose is that the test can identify the changes induced by the procedures of aesthetic medicine and surgery and the consequent variation of the percep-

tion of their own body. This is as important as the internal validity and reliability of the test to get an accurate patient-centered description. In addition, to establish the efficacy of a cosmetic procedure, a questionnaire must be calibrated to detect a difference before and after the surgery itself. The opportunity of a questionnaire is therefore determined not only by its reliability and validity, but also by its response (sensitivity to changes) induced by the procedures performed on patients<sup>15</sup>. Cosmetic medical treatments have become an increasingly popular and acceptable means of improving physical appearance<sup>1</sup>. Medical and mental health professionals' interest in persons who seek these treatments predates the recent explosion in popularity. While patients typically report satisfaction with their postoperative result, based on existing studies, it may be too early to conclude that all procedures lead to positive psychological outcomes<sup>16</sup>. More recently, studies have begun to focus on the construct of body image and its relationship to cosmetic medical treatments<sup>17</sup>. Empirical evidence from a growing number of studies suggests that cosmetic patients report body image dissatisfaction preoperatively and improvements in body image postoperatively. Measuring patient-reported outcomes has become increasingly important in cosmetic and reconstructive breast surgery.

The DAS59 is an instrument to scientifically and reliably evaluate the variation of the quality of life after plastic and reconstructive surgery procedures. The Derriford Appearance Scale was specifically designed to measure the psychosocial adjustment in patients with appearance problems. This scale has demonstrated excellent reliability and validity and has been used in a general population with no appearance concerns, general population with appearance concerns, and clinical population with appearance problems. In a previous study<sup>9</sup>, the authors published the Italian Translation of DAS59 and its first application to an Italian sample, in which participants reported no significant comprehension difficulties and the study population showed a marked sensitivity to the subject matter, with a large proportion of respondents reporting sensitivity to some feature of their body. Overall, the Italian sample demonstrated significantly more distress and dysfunction as assessed by the DAS59 total scores than those in the UK sample. The Italian sample also demonstrated a difference between the sexes with respect to total scores, with women more distressed (scoring higher) than men for the subscales of sexual/bodily self-consciousness, and social self-consciousness. With this study, we want

to describe the complete translation and validation protocol of DAS59 into an Italian version based on a statistical analysis of a larger sample (800 patients). The overall internal consistency was excellent ( $\alpha = 0.95$ ) and equal to that of the original article that first described the scale. There was a good correlation between all the items, representing good homogeneity. Domains also demonstrated good internal consistency (Cronbach's alpha) and correlation within themselves. The construct validity of the Italian DAS59 was assessed under convergent validity that was confirmed by correlation with scales related to other psychological conditions. Only GHQ12 showed a relevant correlation with DAS59, while BDI-II did not show any relevant correlation with DAS59. Nevertheless, all the different scales (Table II, with the only exception of NSC) are significantly different between the two clinical and non-clinical samples. This points to a peculiar characteristic of DAS59 that is linked to aesthetic self-confidence, not necessarily paralleling other psychological dimensions. Our results confirm the internal consistency of DAS59, its ability to discriminate between different clinical conditions and its relative uniqueness with respect to other psychological scales looking at different traits. The dramatic difference between sexes in terms of test-retest correlation is worth noting. It may be that females are much more "self-aware" of their general appearance than males, who may fill out the questionnaire with no specific insight as to their appearance.

All in all, this study affirms that the DAS59 can be very useful in both evaluating the efficacy of aesthetic and reconstructive surgery and going further to examine the motivations underlying the request of aesthetic surgical procedures. Analysis of the factorial structure of the Italian study requires a more detailed study aimed at investigating the various dimensions underlying DAS59 to elucidate the differences in self-awareness highlighted by the apparently paradoxical sex effect on test-retest correlations.

## Conclusions

A reliable and valid Italian version of DAS59 was developed to measure psychological impact and adjustment for use in subjects with appearance problems.

The dramatic gender-related difference in test-retest analysis opens interesting perspectives as far as the differences in aesthetic self-perception between males and females.

## Ethical approval

All procedures performed in studies involving human participants were in accordance with the Ethical Standards of the Institutional and/or National Research Committee and with the 1964 Helsinki declaration and its later amendments or comparable Ethical Standards.

## Financial disclosure

None of the authors has a financial interest in any of the products, devices, or drugs mentioned in this manuscript.

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